The First European Communicable Disease Epidemiological Report

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**European Centre
for Disease Prevention and
Control**

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Foreword by Markos Kyprianou, European Commissioner for Health

Ever since it became operational in May 2005 one of the key tasks of ECDC has been to provide the European Commission and Member States with the high quality scientific evidence they need in order to make good policy decisions. This report is a major delivery of scientific evidence from ECDC.

The Centre has produced the first ever comprehensive analysis of the threat posed by communicable diseases in the EU. As the ECDC Director points out in her Preface, much of the data has come from networks, funded by the European Commission over the past decade, that have conducted surveillance on specific diseases or groups of diseases. The great value of this report is that data from numerous EU-level sources has been pulled together, standardised as far as possible, compared and analysed. The report is a remarkable document, the product of many thousands of hours of scientific work, and deserves to be read with care in ministries of health and public health institutes across the EU, as well as in the European Commission.

The epidemiological analysis contained in it will be a key tool for setting priorities on disease prevention and control for years to come. While for most of the 49 diseases examined the 10-year trend in the EU is either stable or declining, there are some clear pointers to challenges ahead. These need to be acknowledged – and acted on.

Perhaps the biggest challenge we face is the emergence of new microbes against which our defences are weak, or even non-existent. The threat of an influenza pandemic, which could be caused if one of the existing flu viruses were to mutate into a new super-virulent strain, has received much attention in the past two years. Rightly so. The world saw three such pandemics in the 20th century, and we know a 21st century pandemic could cause massive suffering and social disruption if we are not properly prepared. Pandemic preparedness is, and must remain, a priority for the EU. But deadly new microbes can also emerge in less spectacular ways. Healthcare-associated infections have become a major issue of concern in the EU, with many of these caused by new or emerging drug resistant microbes. It is unacceptable to me that one in every ten patients entering hospital in the EU will catch an infection there. Supporting action to address this problem will be a priority for the Commission and for ECDC in the coming year.

HIV/AIDS and tuberculosis must be priorities for health policy makers in the EU. While the incidence of these diseases across the EU is low by international standards, the overall number of infections for both runs to the tens of thousands each year. New diagnoses of HIV are rising across the EU, while tuberculosis cases have risen among certain vulnerable groups. That is

why, in March this year, I asked ECDC to develop an action plan on tuberculosis in the EU and to help the Commission and Member States identify good practice in HIV prevention.

The next few years will be important for the development of EU-level public health capacity. ECDC is set to more than double its staff over the next two years, while the new EU Public Health Programme will become fully operational. New resources are available for the prevention and control of communicable diseases, and it is vital – both for the EU and its citizens – that these resources are used for maximum effect. This report will help us do that.

Markos Kyprianou.

Preface

The European Centre for Disease Prevention and Control (ECDC) was established by the European Parliament and Council to identify, assess and communicate current and emerging threats to human health from communicable disease. This First Annual Epidemiological Report on Communicable Diseases in Europe will be one of a variety of mechanisms that we intend to use to better communicate our assessment of the emerging threats of communicable disease.

This report attempts to give a broader perspective of the present EU context, including crude trends of the main communicable disease determinants, such as the social and demographic contexts or the variability of surveillance systems. It also presents a brief epidemiological analysis of each of the main diseases, based on available data, and then provides a highlight of the main issues and threats. It concludes with our views on the broad actions required to deal with these issues in order to minimise their burden and impact.

Of course, this first ever report is still some way from what we would like to produce. One needs to bear in mind that while this report was being designed, created and prepared, ECDC was still in the process of developing a new centralised European surveillance database (the TESSy), we were focusing heavily on recruitment of a critical mass of surveillance personnel, organising the evaluation of the dedicated surveillance networks (DSNs) and working on managing the delicate transfer of their various databases to ECDC, not to mention many other start up activities that, once completed, will have a major influence on the contents, quality and layout of future editions of the Annual Epidemiological Report.

This report relied on data originally reported to the Basic Surveillance Network (BSN), but which was then confirmed by the national authorities, for the more detailed description for the year 2005, and from Eurostat for trend analyses for 1995–2004. These sources were complemented with data and information from several other sources, including the EU-funded dedicated surveillance networks and a number of publications from scientific journals. An extensive data validation exercise was also carried out with all the contributing countries to ensure that the base data used was as accurate as possible and for this I thank our country counterparts for their selfless efforts and serious commitment. Despite this, we recognise that the problem of producing reliable communicable disease data from all Member States at this time, that is valid for genuine comparisons, is longstanding and complex. The wide variability in the effectiveness of the present surveillance systems, the differences in prioritisation of resources for surveillance, but also in basic matters such as clinical traditions to obtain cultures (or similarly push for confirmation of diagnosis) from patients, make it meaningless today to try to directly compare these figures between countries. We know that countries with good, enhanced or mandatory surveillance systems in place often appear to have higher incidences of diseases, possibly putting their public

health services in a poorer light when compared to other countries where the surveillance of disease is a lower priority activity and given less effort. Still, we present this data, as we feel that certain trends and conclusions are still very valid and should be carefully considered by epidemiologists, public health planners, health service managers, policy makers and politicians.

My team has invested many thousands of hours in producing this first report. We agree that this experience confirms that the surveillance of communicable diseases in the European Union must be improved. There are huge differences of accuracy – and therefore usefulness – of the reported data, both between diseases and between Member States. I believe that this is one of the main challenges for ECDC to address. We know that over the next few years we will see the overall public health capacity in the EU grow significantly. On our part I will ensure that ECDC will be investing significant resources to ensure that the EU-wide deficiencies with comparability of surveillance systems and their response capacity will be reduced to the benefit of us all. Apart from the obvious direct benefits of more reliable data for the countries themselves, these improvements will help at the European level and should become clearly evident to all in the improved scientific excellence of future editions of our Annual Epidemiological Report on Communicable Diseases in Europe.

Zsuzsanna Jakab
Director, ECDC
May 2007

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List of abbreviations and acronyms

AI	Avian influenza
AIDS	Acquired Immune Deficiency Syndrome
AMR	Antimicrobial resistance
BCG	Bacille Calmette-Guérin
BSE	Bovine spongiform encephalopathy
BSI	Bloodstream infections
BSN	Basic surveillance network
CCHF	Crimean-Congo haemorrhagic fever
CD	Communicable disease(s)
CISID	Centralized information system for infectious diseases
CJD	Creutzfeldt-Jakob disease
CRI	Congenital rubella infection
DALY	Disability adjusted life years
DDD	Defined daily doses
DG RTD	Directorate-General for Research
DG SANCO	Directorate-General for Health and Consumer Protection
DSN	Dedicated surveillance network
EARSS	European Antimicrobial Resistance Surveillance System
EC	European Commission
ECDC	European Centre for Disease Prevention and Control
ECHI	European Community Health Indicators
EEA	European Economic Area
EEA	European Environment Agency
EFSA	European Food Safety Authority
EFTA	European Free Trade Association
EHEC	Entero-haemorrhagic *Escherichia coli*
EISS	European Influenza Surveillance Scheme
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
EMEA	European Medicines Agency

ENIVD	European Network for Diagnostics of Imported Viral Diseases
ENTER-NET	International Surveillance Network for the Enteric Infections
EPIET	European Programme for Intervention Epidemiology Training
ESAC	European Surveillance of Antimicrobial Consumption
ESCMID	European Society of Clinical Microbiology and Infectious Diseases
ESSTI	European Surveillance of Sexually Transmitted Infections
EU	European Union
EUCAST	European Committee on Antimicrobial Susceptibility Testing
EU IBIS	European Union Invasive Bacterial Infections Surveillance
EUREGHA	European Regional and local Health Authorities
EuroHIV	European Centre for the Epidemiological Monitoring of AIDS
EuroTB	Surveillance of Tuberculosis in Europe
EUVAC.NET	Surveillance Community Network for Vaccine Preventable Infectious Diseases
EWGLINET	European Working Group for Legionella Infections
EWRS	Early Warning and Response System
FETP	Field Epidemiology Training Programmes
FMD	Foot-and-mouth disease
FSU	Former Soviet Union
GBD	Global burden of disease
GNP	Gross National Product
GOARN	WHO Global Outbreak and Response Network
GP	General practitioner
HAART	Highly active anti-retroviral therapy
HAV	Hepatitis A virus
HBV	Hepatitis B virus
HC	Healthcare
HCAI	Healthcare-associated infection
HCV	Hepatitis C virus
HELICS	Hospitals in Europe Link for Infection Control through Surveillance
HFA-DB	WHO health for all database

Hib	*Haemophilus influenzae* type b
HIV	Human immunodeficiency virus
HPAI	Highly pathogenic avian influenza
HPRO	Hip prothesis
HPV	Human papilloma virus
HUS	Haemolytic and uremic syndrome
HYE	Healthy year equivalent
ICU	Intensive care units
IDU	Injecting drug users
IHR	International Health Regulations
IPSE	Improving Patient Safety in Europe
LGV	Lymphogranuloma venereum
LPAI	Low pathogenic avian influenza
MDR	Multi-drug resistant
MIC	Minimum inhibitory concentration
MMR	Measles mumps & rubella
MRSA	Methicillin-resistant *Staphylococcus aureus*
MS	Member State(s)
MSM	Men who have sex with men
MSSA	Methicillin-sensitive *Staphylococcus aureus*
NGO	Non-governmental organisation
NI	Nosocomial infection
NNIS	National nosocomial infections surveillance system
OBmF	Officially *B. melitensis* free
OBF	Officially Brucellosis free
OPV	Oral polio vaccine
PH	Public health
PHC	Public healthcare
PLHIV	People living with HIV
PN	Pneumonia

QALY	Quality adjusted life year
RNA	Ribonucleic acid
SARS	Severe acute respiratory syndrome
SARS-CoV	SARS-associated corona virus
SSI	Surgical site infection
STEC	Shiga-toxin producing *Escherichia coli*
STI	Sexually transmitted infection
TB	Tuberculosis
TTT	Threat tracking tool
vCJD	Variant Creutzfeldt-Jakob disease
VHF	Viral haemorrhagic fevers
VPD	Vaccine preventable disease
VTEC	Verocytotoxin-producing *Escherichia coli*
WHO	World Health Organization
WHO EURO	WHO European Region
WNV	West Nile virus
XDR	Extensively drug resistant
YFV	Yellow fever virus

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Summary

One of the main purposes of this report is to identify those diseases or disease-specific areas where further work is needed in the EU to anticipate and counter rising trends. From the available data, it is possible to estimate where the main burden of infectious diseases now lies in the Union. In these areas, further concerted action is needed in order to decrease the burden on society, on public health and healthcare systems, and to reduce human suffering.

However, the present data on which to build such conclusions are far from perfect, and one important lesson to draw from this report is that surveillance of communicable diseases in the European Union must be improved. There are huge differences of accuracy, and hence usefulness, of the reported data, both between diseases and between Member States.

For some diseases there has been significant reduction in the incidence and number of cases through concerted prevention and control action by Member States (even though levels remain high in specific population segments and risk groups). For some of these diseases further joint actions (e.g. through vaccination and similar control measures) could lead to the EU, and eventually Europe, being declared 'free' of the disease. This would ensure that EU citizens, no matter where they live or travel in the EU, will be protected from the threat of that disease. The fact that this can be done with concerted, determined and joint action of many partners has been shown most recently by Europe being declared 'polio free' by WHO, with measles as the next potential candidate. Until such time, strict vigilance is essential to ensure that the ever present threat of infection and resurgence to previously high levels does not materialise.

Why such vigilance is important can be deduced from the overview of trends for the 49 diseases under surveillance (table A). Of the 49 diseases, 22 have incidence levels that are in double or triple digits (per million population) with half of the 22 also having rising (or stable) trends. It is of concern that three of the six diseases with the highest incidence in the EU are part of this group of diseases with rising/stable trends; rising trends are also observed for the two diseases with the highest crude incidence levels in the EU (*Chlamydia* infection and campylobacteriosis), but this could be also due to improved surveillance. Fourteen of the above 22 diseases affect the younger age groups (under 24 years) indicating that focused action is needed to protect the health of our future generations. Many of the rest (except TB or legionnaires) affect mainly the economically productive population. Of the main disease groups, the 'Zoonoses' and 'Serious imported disease' groups had the lowest incidence rates and also show decreasing trends (except for avian influenza, AMR and malaria).

Taking the above trends and other factors (such as public health impact and emerging threats) into account, it can be concluded that at present the major communicable disease threats in the EU are the following:

- **Healthcare-associated infections, with or without antimicrobial-resistant pathogens**. The most important disease threat in Europe is posed by the micro-organisms that have become resistant to antibiotics. Infections with such bacteria are a huge and rapidly growing problem in our hospitals, but also in more everyday infections in the community. Every year approximately three million people in the European Union catch a healthcare-associated infection, of whom approximately 50 000 die.

- **HIV infection**. 28 044 new cases of HIV were reported in EU countries in 2005. The total number of people living with HIV in the EU is estimated to be around 700 000. Of these people, some 30% – around 200 000 – do not know they have HIV.

- **Pneumococcal infections**. This is the main bacterial cause of respiratory tract infections, with high death rates (especially in young children and the elderly) when the infection is invasive (causing bacteraemia or meningitis). Effective vaccines against invasive disease are now available.

- **Influenza** (pandemic potential as well as annual seasonal epidemics). Each winter, hundreds of thousands of people in the EU become seriously ill as a result of seasonal influenza.

Of these, several thousand will die in an average influenza season, often unnecessarily as effective vaccines are available for those most at risk.

- **Tuberculosis**. Nearly 60 000 cases of TB were reported in the 25 EU Member States in 2005. TB cases continue to rise among vulnerable groups such as migrants and HIV-positive people. Cases of drug-resistant TB, which are very difficult or even impossible to treat, are being seen across the EU, but particularly in the Baltic States.

Two further diseases have very a high incidence, namely *Chlamydia* infection and campylobacteriosis, both with nearly 200 000 annually reported cases (known to be an underestimate). Even though they do not cause such serious disease as the priority diseases above, the sheer number of cases presents a huge challenge.

The report also shows that across the EU there is heterogeneity in health services organisation, in the way communicable disease prevention and control are managed and the surveillance systems (with a consequential effect on the comparability of incidence data) not to mention inherent socioeconomic differences.

Whilst the main responsibility for action obviously lies with the Member States, ECDC can assist in providing the evidence base for action, in identifying and sharing best practice, and in suggesting methods for follow-up of interventions made.

However, more and better data and scientific studies are needed to clearly understand the relative importance of the different disease areas. Part of the ECDC's remit over the coming years is to bring more clarity to actual figures for incidence, morbidity, mortality, cost, burden, etc., and to suggest effective evidence-based prevention actions.

Most of the information will continue to rely on data from routine surveillance in the Member States. In order to interpret these data properly, one must realise that the original function of national surveillance systems was the detection of outbreaks, not to produce data for more in-depth analyses of risk factors, determinants, or burden of disease. Furthermore, most routine surveillance systems are built on the paradigm that a person is infected, falls ill, goes to see a doctor, is diagnosed, and finally the case is notified. For a large number of diseases under EU-wide surveillance, this 'classical' view does not hold at all: HIV, *Chlamydia* infection, hepatitis C, toxoplasmosis, to name just a few, are often discovered by the laboratory in asymptomatic patients either by chance, as a more or less unexpected finding in a medical investigation, or as part of a screening programme. For many of the diseases discussed in this report, national incidence figures thus often reflect activity to find asymptomatic patients rather than reflecting the 'true' incidence of infection.

This shift from a 'clinic-based' to a 'laboratory-based' surveillance has important implications. One is that the laboratory capabilities of the Member States must be brought up to the same level, another is that we need 'denominator data' for a number of such asymptomatic infections; in other words the number of tests performed, not just the number of tests found positive.

The annual costs for the health services of treating communicable diseases are significant, as indicated by country-based estimates. For example, in England, from GP consultations and hospital admissions, the costs related to communicable diseases have been estimated at £4.4 billion, increasing to around £6 billion when the two major areas of HIV/AIDS and hospital-acquired infection treatment are included. Also, a recent study in the Netherlands has estimated annual costs based on both the direct health service costs and indirect costs (i.e. the impact on sectors other than health). This study has shown that for the Netherlands (population of 16 million) in 2004 the cost attributable to norovirus was € 25.0 million, to campylobacteriosis € 22.3 million, to rotavirus € 21.7 million and to salmonellosis € 8.8 million. Extrapolated to the EU level these country estimates indicate annual costs in the EU of the order of billions of euro.

Besides the direct and indirect annual costs, the last decade has seen high profile crises such as SARS and avian influenza. In a globalised world the overall consequences of communicable diseases can be very severe and instantaneous, affecting many countries and sectors other than health. The 2003 SARS outbreak cost some countries about 1% of their economies, primarily

through lost tourism and travel revenues. In the case of pandemics, no part of society and no country is immune. Country-specific outbreaks (eg vCJD and avian influenza) have also shown the huge impact on specific sectors (especially the food and agricultural sectors) with costs around €10 billion per episode in some countries.

The visible impact of these communicable diseases on the:

- health of present and future generations;
- annual and continuing costs to the health and related sectors; and
- health and cost consequences of recent high profile outbreaks,

has given a new impetus, importance and urgency to effective disease surveillance, prevention and control: not only within countries but also to collaboration between countries and between the relevant and concerned sectors.

Here follows a brief summary of the findings for each of the main disease groups:

Antimicrobial resistance (AMR)

This is a huge field, and proper surveillance for AMR has only just started in the EU. The available data suggests variations in the problem across the Union.

The bacterium that has received prime attention is methicillin-resistant *Staphylococcus aureus* (MRSA), which has become a healthcare problem in most Member States. The incidence of MRSA is rising almost everywhere: an increasing proportion of all invasive *S. aureus* infections are caused by MRSA, and only two countries seem to have been able to reverse this trend. For most other bacteria under EU surveillance, such as enterococci, *Escherichia coli*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*, the overall trend is also worrying. For pneumococci the picture is more varied.

One important factor in the development of AMR is the frequency of antibiotics used. It is difficult to understand why antibiotic consumption per inhabitant varies 3-fold between Member States. The continuing follow-up of antibiotic usage in the countries is an important task, and for prevention, more action needs to be taken to influence prescription habits and patient expectations.

Healthcare-associated infections (HCAI)

Even less is known about the size of this problem in the Union than for AMR. Estimates suggest that three million healthcare-associated infections and 50 000 deaths are attributable to these infections each year in the EU, and that one patient out of 10 in an EU hospital acquires such an infection.

Surveillance of HCAI is difficult: there are problems with standardisation and with reporting compliance. Since HCAI surveillance requires the collection of risk factors and the involvement of clinicians, infection control staff and microbiologists, it is labour-intensive and therefore mostly targeted at specific high-risk populations. Furthermore, several EU Member States still do not have a national surveillance network for nosocomial infections, since setting up such a programme usually involves important political decisions, specific legislation and a sizable financial investment at the national and hospital level. Probably some 20–30% of nosocomial infections are preventable by an intensive infection control programme that includes surveillance.

Antimicrobial resistance and healthcare-associated infections, either combined or separately, constitute a major infectious disease problem in the EU, and show signs of becoming even worse in the future. They may not attract the same attention as more outbreak-prone diseases, partly due to the fact that it is mainly the frail and the already ill that suffer the consequences, not yet so much the population at large. We clearly need better systems to follow their magnitude in order to be able to evaluate any intervention measures.

HIV, sexually transmitted infections, hepatitis B and C

HIV

The majority of newly diagnosed HIV infections in the EU are in immigrants from countries with a generalised HIV epidemic (mainly in sub-Saharan Africa) and in men who have sex with men. Infection through intravenous drug use seems to be declining slowly in most of the EU, albeit from very high levels in some of the new Member States. Nosocomial and mother-to-child transmission account for very few cases in the EU.

It is estimated that 30% of the presently HIV-positive persons in the EU are unaware of their infection. Studies have shown that they contribute disproportionately to the spread of the disease. Strong efforts must be made to increase the uptake of testing, and ECDC has started work to provide guidance on this issue for Member States.

As for prevention, action should continue to target the populations at highest risk. These are in the higher incidence countries (where an integrated national effort is needed); men who have sex with men, (where new methods are needed to implement the prevention messages); and migrants from high-risk countries, (where research is needed on how to successfully reach these groups in society).

Immediately following diagnosis, PLHIV (people living with HIV) need to receive life-long treatment, care and support. Currently 90% of infected persons in the EU receive highly active anti-retroviral therapy (HAART). More work is needed to improve accessibility of this therapy to the other PLHIV. Counselling and support is of paramount importance to PLHIV and vulnerable populations at higher risk of infection and therefore best practices will have to be reviewed on how to improve these services in the EU.

STIs

Of the three sexually transmitted infections (STI) under EU-wide surveillance, syphilis and a particular strain of *Chlamydia*, Lymphogranuloma venereum or LGV, are mostly spread between men who have sex with men. The other STI, gonorrhoea, seems to have experienced a peak in incidence in most EU countries just after the turn of the millennium, and is now at a steady level. Only a few Member States report chlamydial infections, but among these the incidence is the highest of the diseases and has been steadily increasing over the last 10 years. *Chlamydia* infection is different from the other STIs in that it mostly affects young people not belonging to any easily identifiable risk group.

Infection with human papilloma virus has received renewed interest through the introduction in 2006 of a vaccine, but is not a reportable disease in most Member States, and figures for prevalence or incidence are generally lacking.

Most of the EU Member States have included hepatitis B vaccine in their national vaccination programmes. Even before this could have had any real effect, the incidence of acute hepatitis B infection has been declining slowly in most countries.

With regard to hepatitis C, the epidemiological situation in the EU is largely unclear, due to lack of good national surveillance data. The disease is widespread, particularly among injecting drug users who appear to become generally infected within one year of their first injection, but other populations are at risk.

For both hepatitis B and C, EU-wide surveillance must be improved significantly.

Respiratory diseases

Influenza

The risk of avian influenza A/H5N1 to humans was first clearly recognised in 2005 from reports from south-east Asia. Starting in late summer, the virus was detected in birds ever closer to

Europe, although there were no human cases. The risk persists that A/H5N1 could mutate into a pandemic strain, even though it is impossible to predict which will be the next strain to cause a pandemic, or when it will appear. Since 2005 there has been an extraordinary concerted effort by all EU countries to strengthen their readiness for a pandemic. However, much remains to be done and it is estimated that another two to three years of intense work are required by all Member States as well as EU institutions. Key areas where further work is especially needed are:

- integrated planning across governments;
- making plans operational at the local level;
- interoperability at the national level;
- stepping up prevention efforts against seasonal influenza;
- extending influenza research.

The seasonal influenza of the 2004–05 and 2005–06 winter seasons was of type H3N2, as in previous years, and both epidemics were of 'medium' size in the EU. It should be understood that even 'ordinary' seasonal influenza poses a considerable public health threat, causing thousands of preventable deaths every year in the Union. Most Member States follow WHO guidance and recommend vaccination against human seasonal influenza each autumn for three major risk groups (the elderly, healthcare workers and those with chronic medical conditions), but few seem able to reach the WHO target for coverage. The vaccine is currently underused, and proper monitoring of coverage is lacking in most countries. There is considerable potential for health gain in Europe, not only by improving vaccination coverage in these selected groups, but also by implementing other measures to minimise virus transmission. In this sense, better application of the ECDC recommended personal protection measures (regular hand-washing, good respiratory hygiene, mask-wearing in healthcare settings during the acute febrile period, early isolation of symptomatic personnel, etc), should reduce the risk for the whole population.

Tuberculosis

Tuberculosis (TB) incidence is declining in the indigenous populations in almost all Member States, where it has mostly been a disease of old people, being re-activated after a primary infection many decades ago. This decline is not only seen in the EU15, but also in the 10 new Member States, although starting from a higher level. This decline in the industrialised world has been remarkably rapid: as an example Iceland in the early 1930s had a TB incidence of 1 000 per 100 000 per year – twice the present figure for Somalia, which is now one of the high-incidence countries in the world (almost 100 times greater than the present EU average), which is 13 cases per 100 000 per year.

Overall, the EU is therefore doing well in the fight against TB. Between 2001 and 2005 the total number of reported TB cases declined annually by 2.5% on average, and in many EU countries TB is becoming a rare disease. It could become a target for elimination, although this would not be achieved quickly: the long latency in many patients between infection and overt disease means that proper elimination would take decades. The overall decline in incidence also implies that several of the Member States that still have a programme for general BCG vaccination of children could consider switching to vaccinating just high-risk groups. Since the vaccine is not without adverse effects, there is a point where the number of serious adverse reactions caused outweigh the few infections prevented.

However, this rather satisfactory situation is contradicted by recent demographical, political and socioeconomic changes in Europe, such as growing migration movements and the changes that followed the collapse of the former Soviet Union. Such changes are becoming the major determinants of the tuberculosis situation in Europe, where TB is becoming more common in migrants, the homeless, poor people in inner cities, prisoners, people living with HIV (PLHIV) and drug users. Furthermore, there are areas with high levels of drug-resistant tuberculosis, mostly due to incomplete or ill-designed treatment regimes.

In the coming years there is a need to improve surveillance of risk groups and drug resistance and to better link laboratory results with surveillance data. Guidance on interventions for specific risk groups, such as guidelines for prevention and control of TB in immigrants, needs to be promoted. In order to achieve the elimination target, an EU action plan will be developed with different emphasis in the strategies for the low versus the medium/high incidence countries. Continued efforts, vigilance, monitoring, case detection and treatment are needed to continue with the downward trends and to ensure that the EU countries can move towards elimination.

Legionellosis

The incidence of legionellosis is clearly increasing in the EU, with most cases being reported from southern Europe. Several big outbreaks occurred in 2005. More research is needed on the reasons for this trend, and on the specific risk factors.

Vaccine-preventable diseases

Vaccines available in Europe are generally very efficient, and national vaccination programmes, despite their remarkable variety across the Union, are all designed to give good protection. The main problem is to achieve better coverage even in the hard-to-reach groups of the population as these have frequently been implicated in outbreaks once a critical number of non-immune individuals is reached.

Several of the more serious vaccine-preventable diseases are now almost eradicated from the Union: there have been no endemic cases of polio since 1992, only a few cases of diphtheria are still being reported annually from a handful of Member States, and reported tetanus rates are around one case per million inhabitants or lower.

All diseases covered by the MMR vaccine, measles, mumps and rubella, continue to show a good rate of decline in the EU, even if the vaccine coverage is not uniform, with one large Member State reporting almost three quarters of all EU measles cases. The same downward trend is seen for invasive infection with *Haemophilus influenzae* type b in the countries that have introduced this vaccine. For pertussis, the picture is somewhat more complex: overall EU incidence seems to be rising slightly, and there are indications that the programmes do not have the intended effect of preventing death in young infants, which is one of the main objectives of a pertussis programme.

There are two invasive bacterial infections for which vaccines are available, but that are not routinely used in most Member States, namely pneumococcal and meningococcal infection. Rates for invasive pneumococcal infection seem to have remained stable across the Union at between five and six cases per year per 100 000 per year, but this is a serious infectious disease causing several thousand deaths each year, especially in the very young and the very old. Meningococcal meningitis is one of the diseases for which surveillance figures are more reliable: it is a serious and very characteristic disease receiving high public attention. Annual rates remain steady at just over one case per 100 000 per year. A good vaccine is only available for one of the two main strains of meningococci commonly seen in Europe, but it is still being introduced in some Member States.

Most of the childhood diseases that are now preventable by vaccination have been decreasing in number over the past few years as a result of these effective childhood vaccination programmes. Yet, despite all the efforts, outbreaks still occur in population subgroups where vaccination uptake remains poor. Further, unwarranted doubts about vaccine safety, fuelled by the media in some Members States have set back targets for various of these infections, causing localised outbreaks that should have been completely preventable.

New vaccines have recently been, or soon will be, be licensed (e.g. against varicella, human papilloma virus and rotavirus) which raises the question as to whether they should be included in vaccination programmes, and if so, how to monitor the impact and the adverse effects at the EU level following the immunisation.

Food- and water-borne diseases

There are a large number of diseases grouped together under this heading, some of great public health importance, some of lesser concern to humans, but still relevant to the food industry.

Surveillance for several of these diseases has improved considerably in many Member States over the last decade, and it is difficult to decide whether an increase in reported incidence reflects a genuine increase or rather improved detection. However, for two important infections, salmonellosis (including typhi and paratyphi) and shigellosis, there seems to be a downward trend in the EU. *Campylobacter* are the most commonly diagnosed food-borne bacteria in the EU, and may be increasing slowly over time. *Cryptosporidium* has caused waterborne outbreaks in several Member States.

Besides these important infections, there a several food- or waterborne infections that are either of regional concern (brucellosis, echinococcosis, trichinellosis, leptospirosis), or that are of main concern for the immuno-compromised, the foetus and the very young (listeriosis, toxoplasmosis). Indications are that listeriosis may be increasing, but as for toxoplasmosis, the data are quite unreliable.

Hepatitis A is declining in the Union, but this also means that more and more people remain susceptible to this virus, and smaller outbreaks are still seen in several countries.

Cholera is exclusively an imported disease to the EU, with almost no secondary domestic cases seen in recent years.

Norovirus and rotavirus infections are not reportable in the EU, but are both important causes of gastroenteritis all over the Union. It appears that outbreaks caused by norovirus in confined places, such as schools, hospitals and cruise ships are on the increase, but it should be realised that methods for laboratory diagnosis have really only been available for the last decade.

The true size of the problem posed by food- and water-borne infections is difficult to ascertain: even the best national surveillance systems miss the majority of cases, namely those patients who do not seek health care for their symptoms of gastroenteritis. Surveillance of these diseases remains important, not only to discover and, ideally, stop an outbreak, but even more importantly to identify weaknesses in food (and water) processing and handling, in order to make informed improvements in the future.

An enhanced surveillance for all food-borne diseases (covering all the diseases, but also enhancing the information collected, including antibiotic resistance where appropriate) is therefore a priority. Such a system should integrate laboratory data, in particular from molecular sub-typing.

Other zoonoses

The most important non-food zoonoses in the Union are tularaemia, hantavirus infections, borreliosis and tick-borne encephalitis. Of these, only tularaemia is under EU surveillance. This is a disease mainly seen in the north and in sparsely populated areas of central Europe. It appears in outbreaks at intervals of several years, and any actual trend is difficult to describe.

A number of exotic diseases, such as viral haemorrhagic fevers, malaria and plague should be reported to the EU network, but these cases, if any, are almost all imported. The main reason for surveillance for malaria is not to discover any spread in the EU, but rather to ensure that our recommendations for prophylaxis remain valid.

Few of the exotic diseases pose any major public health threat to the EU citizens but some of them are prone to outbreaks, which always attract a lot of media attention. It is important to follow their epidemiology in order to give adequate information to the EU public.

Table A. Summary of general trends (1995–2005), EU incidence (2005), main age groups affected (2005), and major threats detected (2005) for diseases reported on EU-level

Disease	General 10-year trends	EU incidence per 100 000 (2005)	Main age groups affected (2005)	Major threats monitored/ detected (2005)
Antimicrobial resistance (AMR) and healthcare-associated infections (HCAI)				
AMR	↑	Not applicable	No data	0
Nosocomial infections	No reliable data	Not applicable	No data	0
HIV, sexually transmitted infections (STI) and blood-borne viral infections				
HIV*	↑	7.4	20–29	0
AIDS	↓	1.5	30–39	0
Chlamydia infection	↑	99.4	15–24	0
Gonorrhoea	↔	9.5	15–24	0
Syphilis	↔	3.5	25–44	0
Hepatitis B	↓	1.5	25–44	1
Hepatitis C	↑	8.6	25–44	0
Respiratory tract infections				
Influenza	↔	No data	0–14	1
Avian influenza	↑	0	Not applicable	1
Tuberculosis	↓	13	65+	1
Legionnaires' disease (legionellosis)	↑	1.1	65+	6
SARS	Not applicable	0	Not applicable	0
Vaccine-preventable diseases (VPD)				
Invasive pneumococcal infection	↔	5.8	0–4, 65+	0
Invasive meningococcal disease	↓	1.2	0–4	2
Invasive infection caused by Haemophilus influenzae type b	↓	0.3	0–4	0
Pertussis	↓	4.2	0–4, 5–14	0
Diphtheria	↓	<0.1	0–4	0
Tetanus	↓	<0.1	65+	0
Measles	↓	0.3	0–4	3

Mumps	↓	17.7	5–14, 0–4	0
Rubella	↓	0.5	0–4	0
Poliomyelitis	↓	0	0	4
Smallpox	Not applicable	0	0	0
Food- and waterborne infections				
Campylobacteriosis	↑	45.1	0–4	0
Salmonellosis	↓	39	0–4	13
Typhoid/paratyphoid fever	↓	0.3	0–4	1
Shigellosis	↓	1.8	0–4	0
Verocytotoxin-producing Escherichia coli (VTEC)	↑	1.2	0–4	6
Yersiniosis	↔	2.2	0–4	0
Listeriosis	↑	0.3	65+	1
Brucellosis	↓	0.3	45–64, 25–44	2
Botulism	↔	<0.1	45–64, 25–44	1
Cholera	↓	<0.1	15–24	6
Hepatitis A	↓	1.7	5–14	3
Giardiasis	↔	5.2	0–4	0
Cryptosporidiosis	↓	2.8	0–4	0
Echinococcosis	↓	<0.1	65+	0
Trichinellosis	↓	<0.1	5–14, 45–64	0
Variant CJD	↔	<0.1	no data	2
Toxoplasmosis	↓	0.8	5–14	0
Other diseases of zoonotic and environmental origin				
Tularaemia	↔	0.1	45–64	0
Q Fever	↔	0.3	45–64, 25–44	0
Leptospirosis	↔	0.2	45–64	0
Anthrax	↔	<0.1	no data	1
West Nile Virus	Not applicable	<0.1	No data	1
Rabies	↓	<0.1	45–64	2
Malaria	↓	1.1	25–44	0

Viral haemorrhagic fevers (VHF)	Not applicable	Not applicable	Not applicable	7
Yellow fever	↓	0	0	2
Plague	↓	0	0	0

*Based on data from all countries of the WHO European Region.

Another finding of the report is that the present list of disease for EU-wide surveillance should be revisited at regular intervals to determine whether all diseases still merit inclusion in the list or whether any other diseases should be added. ECDC, together with its Advisory Forum, will therefore review the list regularly and advise the Commission and Member States on the need for changes.

The future

This report attempts to capture the epidemiological situation for a number of infectious diseases over the last 10 years. It is difficult to predict how this will change in the coming years.

One should just consider: three new infectious diseases over the last three decades are: HIV infection, variant Creutzfeldt-Jakob's disease and SARS. They are three completely different diseases, each with its own transmission route, attack rate, clinical picture and natural history. Their emergence would have been almost impossible to predict in 1977.

However, some determinants can be identified that will probably affect the infectious disease picture in the EU:

- *the aging population* will increase overall susceptibility to several of the infections in this report;
- *climate change*, with global warming and increased frequency of extreme weather, could bring diseases that are now only seen in the tropics into Europe;
- *increased travel and migration* will bring EU citizens into contact with diseases that do not normally occur here;
- *societal changes*, such as urbanisation, large indoor mass gatherings, daycare homes for children, etc, will increase the risk of diseases, especially those that are respiratory-spread;
- *sexual contact patterns* that started changing profoundly even before the contraceptive pill was introduced may well continue to develop in ways that would favour the spread of sexually transmitted infections;
- *antimicrobial resistance* is a rapidly increasing problem, which will not go away unless actively addressed.

In order to be prepared for such shifts in the infectious disease panorama, considerable research and studies are needed on the present and probable future determinants of infectious disease in the European Union.

1 Introduction

1.1 Background

The aim of this report is to provide an overview of the situation and trends of communicable diseases (CDs) in the EU for 2005. The report also examines some of the main social and demographic issues over the last decade, in order to make action proposals for decision makers to strengthen prevention, control and surveillance in EU.

The core of the report is a brief epidemiological analysis, based on the available data and indicators, of the trends of the 46 CDs under national surveillance, together with SARS, avian influenza and West Nile virus. Also included is a description of some of the demographic and socioeconomic determinants related to these diseases, their potential economic impact and the position of the European public health and healthcare services to cope with these risks and diseases.

The *Annual Epidemiological Report* is intended to serve as a tool for policy makers to use the available data for action and as such it contains (along with the data, analysis and conclusions) some element of risk assessment and trends, as far as the data allow. This function will need to be further developed over the coming years and several gaps in data availability and quality are highlighted for eventual improvement.

1.2 The EU context

The European Centre for Disease Prevention and Control (ECDC) was established by the European Parliament and Council Regulation 851/2004 of 21 April 2004 to identify, assess and communicate current and emerging threats to human health from communicable disease. Within this broad mission statement, the main technical tasks of the Centre fall into the following four categories:

1 Scientific opinions, bringing together technical expertise in specific fields through its various EU-wide networks and through ad hoc scientific panels.

2 Technical assistance and communication about its activities and results, and disseminating information tailored to meet the needs of its different audiences.

3 Epidemiological surveillance and networking of laboratories, i.e. the development of epidemiological surveillance at European level and the maintenance of networks of reference laboratories.

4. Early Warning and Response based on ‘round the clock’ availability of specialists in communicable diseases.

The founding Regulation of ECDC (851/2004/EC) stipulates in Art. 10(2) that it shall ‘provide the Commission, the European Parliament and the European Council with an annual evaluation of the current and emerging threats to health in the Community’. In the Work Programme for 2005–06 set out for the Centre by its Management Board, the mandate, however, is wider, with one of the tasks being to ‘produce an annual epidemiological report that summarises the trends in communicable diseases and the outcome of investigations for outbreaks of EU concern’. In addition, there is a need for an epidemiological evidence base for ECDC’s long-term planning and priority-setting for the coming years, as well as a baseline assessment of the situation at the time ECDC was established.

Therefore, this epidemiological report contains data, analyses and conclusions based on the trends of surveillance data over the last 10 years, as well as the results and implications of the health threats monitored in 2005.

1.3 Structure of the report

The overall **Summary and Conclusions** is a synthesis of the main epidemiological findings of the disease specific chapter and the main conclusions of the remainder of the report.

Chapter 2 is the **Methods** section, where the main data sources and their limitations, the assumptions, as well as any analytical methods used, are very briefly described.

Chapter 3 describes some aspects of the European **Social and Demographic Context** over the last decade that helps to explain the evolution of CDs in this period and possibly indicate future challenges. It also provides a framework to analyse the European Health Systems potential to prevent and control CDs. Section 3.1 provides a brief overview of those demographic trends that are most important and relevant due to their impact or potential impact on CDs in the EU. Section 3.2 analyses the role and capacity of the EU Health Service and Systems to carry out the detection of threats and outbreaks, primary and secondary prevention and control including vaccination; health promotion and protection; and care and control potential for CDs. This sub-chapter is structured by organisational levels (e.g. Primary Health Care, Hospital, Public Health services) and by relevant Public Health functions (detection, prevention, control, treatment).

Chapter 4 is the main chapter on the **Epidemiological Data on Communicable Diseases** in Europe, and covers each of the 46 CDs (Commission Decisions 2119/98/EC and 2003/534/EC) plus SARS, avian influenza and West Nile virus. Graphs are used to help summarise the key findings and to illustrate/emphasise the text. Each disease section is structured as follows:

- Brief general description of the disease.
- Baseline trends over the previous ten years.
- Surveillance data for 2005.
- Additional tables or any Dedicated Surveillance Network activities and their data for the disease.
- Outbreak and threats monitored in 2005 (if relevant).
- Conclusions
- Overview of the main features of the surveillance system for that disease in the countries.

Chapter 5 attempts to comment on some **overall patterns** that seem to emerge from the data in the preceding chapter. Section 5.1 focuses on patterns and trends in selected risk groups and areas with some analysis on chosen topics, issues or determinants This section summarises an analysis of the disease-specific trends and outbreak and threat information in a number of ways in order to try to identify those CD of special concern in the EU. Section 5.2 focuses on the economic consequences of CD outbreaks and epidemics, describes the information available and the gaps related to the estimation of healthcare costs attributable to CD and the financial impact on the overall economic system of a country or region due to CD cases and outbreaks. Section 5.3 introduces the concept of using the 'burden of disease' approach in order to help in priority-setting and policy decision-making processes.

Chapter 6 summarises the actions initiated by ECDC to verify, assess, investigate and respond to **communicable disease threats** in the EU in 2005. This is in brief as many of the systems currently in place had not yet been activated in 2005. In future reports, more analyses of the threat monitoring and detection system in the ECDC and summaries of the lessons learnt and their implications for the future, including improving coordination with other EU alert systems and vital partners such as the World Health Organization will be included in this chapter.

Chapter 7 presents the main **conclusions** of this AER, while section 7.1 includes proposals for action to strengthen prevention, control and surveillance in the EU and section 7.2 has some suggestions for the future development of the *Annual Epidemiological Report*.

References are listed after each chapter or sub-chapter.

The two Annexes describe and list communicable diseases for EU surveillance (**Annex 1**), and the national surveillance systems (**Annex 2**).

A separate executive summary of this report with the essential action points mainly for policy makers and a smaller leaflet of main messages for wider consumption are also available.

Finally, the work to harmonise systems and data at the EU level is on-going. This first Epidemiological Report on CDs in the EU is mainly based on readily available data and information. This means that in several instances the quality and comparability of the data were not ideal and sometimes good EU-level data was just not available. Where this was the case these issues have been documented. Where comparable or more extensive data were already available (even if only for some years or not for all the EU) these have been used to show the trend analysis that would be possible. In the case of the latter, wherever possible country-level exercises and examples are used to illustrate EU-level issues. These two approaches will hopefully also enable the way forward for future reports to be delineated.

2 Description of methods

This Chapter describes the main data sources, assumptions and their limitations.

Demographic and socioeconomic data

The main source for the demographic figures and data was the Eurostat databases available through their website. Additional information was obtained from specific publications and other annual reports (e.g. *Europe in figures: Eurostat yearbook 2005* (European Commission; Eurostat), *Key figures on Europe: Statistical Pocketbook 2006, Data 1995–2005* (European Commission; Eurostat), *Regions: Statistical yearbook 2005* (European Commission; Eurostat), etc) or monographs (e.g. *Statistics in focus* series (European Commission; Eurostat)). Indicators from the ECHI (European Community Health Indicators) were also used, as well as the WHO health for all database (HFA-DB).

Information on social determinants was obtained from publications by several European institutions such as the European Observatory on the Social Situation, European Academy of the Urban Environment and the European Foundation for the Improvement of Working and Living Conditions, amongst others.

For the health services section (section 3.2) publications from the European Observatory on Health Care Systems were one of the main sources, together with articles identified by MEDLINE and *Eurosurveillance* and the outputs of specific disease networks. The references used are included where relevant.

The main limitations of the data and information are documented in the primary sources themselves and the usual limitations with regard to the use of secondary sources apply.

For this report, data available at EU and MS level were used.

2.1 Aggregated data

A Eurostat database (*Infectious diseases – Reported cases and incidence rates per 100 000 inhabitants*) was used for the first draft of the historical background disease information. In addition, country-specific data sheets including all the diseases per country were prepared by the Directorate-General for Health and Consumer Protection (DG Sanco). By a formal joint letter from DG Sanco (John Ryan) and ECDC (Zsuzsanna Jakab), the Member States were asked to update this data and their updates and corrections were then used in the final analysis.

This Eurostat database provides aggregated data on the number of cases per country per year for the period 1980 to 2005. For the purposes of this analysis, the period between 1995 and 2004 was used. The list of countries included the then 25 members of the EU as well as the three EEA/EFTA countries (Iceland, Norway and Liechtenstein) and all these were included in the overall trend graphs. The data was found to be complete for all the years in this period for only a limited number of diseases.

Incidence trend (chart)

For this trend analysis the total incidence of disease per year over the period 1995–2004 for the whole EU/ EEA/EFTA area was calculated. The numerator is the total number of reported cases in a specific year while the denominator is the sum of the population of all countries that reported in that year. When making reference to the source of the data, all countries that provided data (including 0 cases) are included.

2.2 Disaggregated data

For the description of the 2005 situation, data reported directly from the country surveillance system (country reports) were used. The preferred format for this transfer was the old BSN format, however, other formats were accepted. These data tended to contain more detailed

information, for example, age, gender, month of report, etc. Some countries opted not to submit data in this format for 2005, but simply provided frequency tables for each disease. Originally the database was used to distinguish between ‘total reported’ and ‘confirmed’ cases and it was intended that only confirmed cases be taken into account. It soon became apparent that the data-sets are not yet solid enough to allow this distinction to be made with any degree of security and although this was a desirable thought it was abandoned in favour of including confirmed cases if clearly specified, otherwise all officially reported cases were included. In future a greater emphasis on working with ‘confirmed case’ datasets will be made.

Overview

This presents an overview of the number of reported cases and the disease incidence for all countries that provided information throughout the whole of 2005 (including those that reported zero cases); the number of cases reported and the crude incidence rate. The report type indicates the way a country reports the data (‘C’ = Case-based reporting, ‘A’ = Aggregate data reported, ‘—‘ = Not reported). This is based on the description of the report type in the data. Overall crude incidence rates for the EU and EEA/EFTA region are also estimated. In this report it was not possible to identify when the country data were based on a sentinel system and therefore should be related to a specific population denominator (rather than the whole population) before estimating the incidence. However, what information is available on these, is summarised in the country surveillance system overview tables at the end of each disease sub-chapter. This issue is an area that will be looked at more closely in the future reports.

Population data used

Eurostat was the source of all the population/denominator data. Totals per year and per country are available for all countries over the analysed period (1995–2005). For the age- and gender-dependent incidences, age- and gender-specific population data from Eurostat were used: the ‘Population by sex and age as on 1 January of each year’ dataset for 2005. The Eurostat age-specific population data were aggregated into the following age groups used in the analysis: 0–4, 5–14, 15–24, 25–44, 45–64 and 65+ years (with the exception of tuberculosis).

Age distribution (chart or table)

This presents the age-specific disease incidences by age group. Only data from those countries that provided the age data were included. The numerator consists of all the reported cases within the given age group, while the denominator is the sum of the populations within the respective age group, of all the countries that did have cases and provided age-specific information (including those with zero cases reported). The data is usually represented in a chart with the overall incidence for all countries. When making reference to the source of the data, all countries that provided data (excluding those with zero cases) are included. Countries whose total data did not specify this variable (i.e. total = unknown age) in their data were excluded.

Gender distribution table

The gender-specific incidences and/or ratios are estimated based on the data from those countries with this variable included. The totals for the whole of the EU and EEA/EFTA region are presented. When making reference to the source of the data, all countries that provided data (excluding those with zero cases) are included. Countries whose total data did not specify this variable (i.e. total = unknown gender) in their data were excluded.

Season (chart or table)

This distribution presents the total number of reported cases per month for 2005 in order to show a seasonal trend. Only data from the 25 EU and EEA/EFTA countries that provided seasonal data were included. When making reference to the source of the data, all countries that provided data (excluding those with zero cases) are included. Countries whose total data did not specify this variable (i.e. total = unknown month) in their data were excluded.

Importation status

This section discusses the cases that were imported or considered to be local, wherever this was relevant and the data allowed. Countries whose total data did not specify this variable (i.e. total = unknown origin) in their data were excluded.

2.3 Analysis of data

One of the main tasks of the ECDC is to create a common database, with practical, evidence-based, accepted definitions and reporting procedures in order to improve the comparability of the data and therefore the epidemiological situations in the countries. As this was not in place at the time of preparation of this report, with the base data collected from a variety of sources and in a variety of formats (and with variable quality), it was decided that it would probably be counter-productive to carry out a complex analysis on this year's data. The level of analysis is therefore left at a basic level for this report, but as the common epidemiological database becomes the main source for the future reports, more in depth analysis will be carried out, including, for example, modelling and analysis of sub-regional trends.

3 Context

This chapter presents a discussion of those social and demographical changes in the EU during the last decade that may have had a bearing on the current and future evolution of communicable diseases (CD) and related challenges. The role and capacity of EU health systems are also described, both at organisational and functional levels.

3.1 Demographic trends: Europe's changing population and socio-economic structure

The main social and demographical trends that have an impact or potential impact on CD in Europe, include:

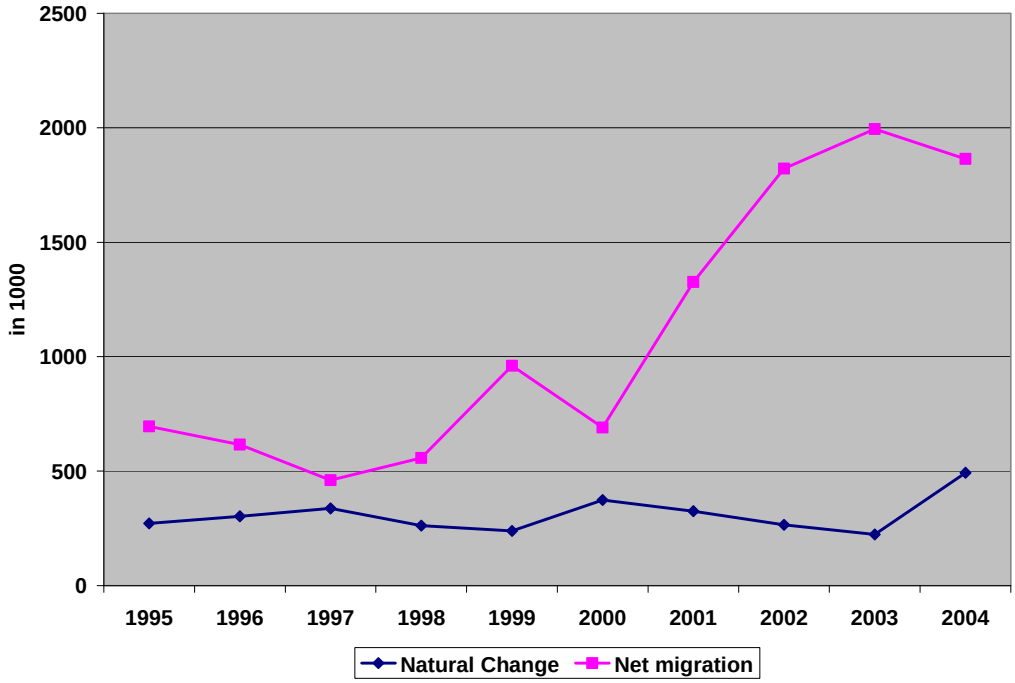
- Changes in the age distribution (ageing process) or in fertility patterns that can have an impact on, for example, the immunity of certain sectors of the population.
- Population movements that affect the dynamics of exposure to CD (e.g. immigration and tourism).
- Trends in the global trade of food and animals that could introduce new risks.
- Changing patterns in the living and working environment and socioeconomic conditions that may affect CD exposure and transmission (like housing and working conditions, unemployment, poverty, income inequalities, urban ghettos and homelessness, access to social and health services).

Europe's population is growing

The population of the 28 countries (EU25 and EEA/EFTA) has grown from 450 million in 1995 to over 466 million in 2005. Almost three quarters (73.9%) are concentrated in six countries: Germany, France, United Kingdom, Italy, Spain and Poland. Over the last five years (2001–05), there has been a marked increase in annual population growth in the EU (from 1.6 million in 2001 to 2.3 million in 2005), due mainly to higher net immigration[1] (figure 3.1.1).

Although fertility rates in the majority of EU countries continued to decline over this period, a handful of countries (in 2004, Ireland: 2.0; France: 1.9; Finland, Sweden and Denmark: 1.8) started to report fertility rates near natural replacement levels (2.1), which could be the start of a reversal of previous trends[2].

Figure 3.1.1. Population change (in 1 000s) in 28 European countries (EU25 and EEA/EFTA) 1995–2004, according to their main components (natural change and net migration)



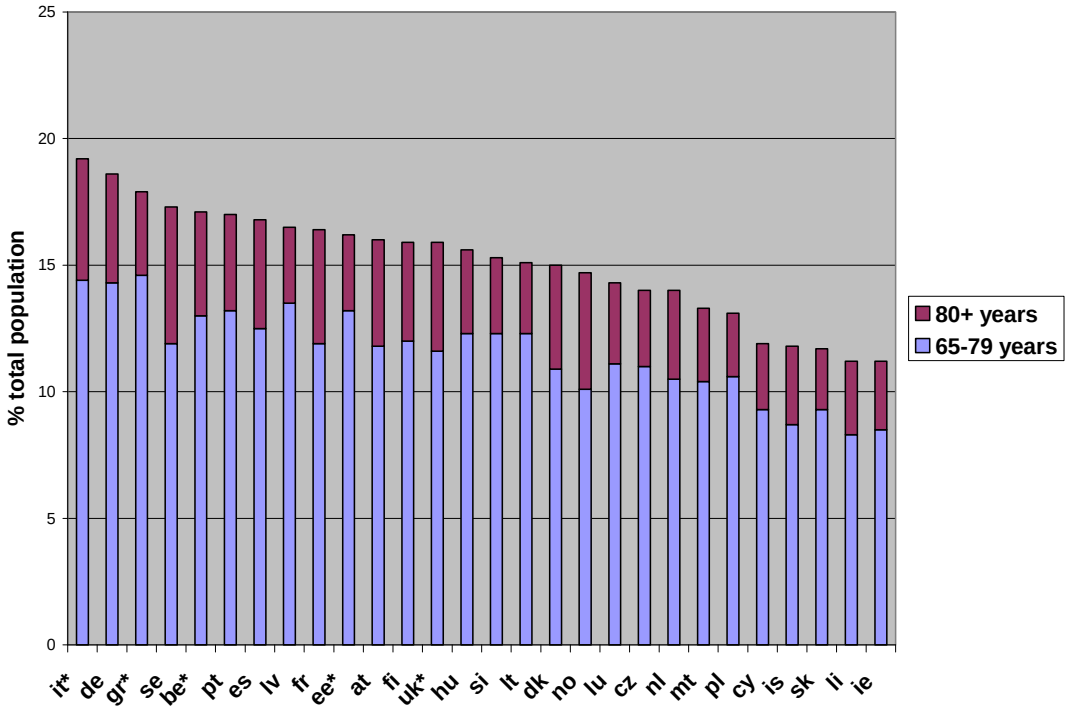
Source: Eurostat.

The ageing process will continue

Both low birth and death rates will contribute to the increasing ageing of Europe. This has implications for the overall population's herd immunity and the ability to resist certain CDs (e.g. influenza and pneumococcal disease), increases the risk of certain outbreaks (e.g. norovirus outbreaks in homes for the elderly) and poses a growing demand on health services.

The countries (figure 3.1.2) with a higher proportion of the population who are 65 and over are Italy (19.2%), Germany (18.6%), Greece (17.9%) and Sweden (17.3%). Sweden also has the largest proportion of population over 80 years old (5.4%).

Figure 3.1.2. Proportion of population aged 65 and over (% of total population) in 28 European countries (EU25 and EEA/EFTA), 2005



Source: Eurostat. *BE, EE, GR, IT and UK data from 2004.

Increasing migration flows: an opportunity but also a challenge

An increase in migration has reinforced the European active working population. Migration is also changing the multiethnic, multicultural and multilinguistic social character, which needs to be borne in mind when considering CD prevention and control policies.

Some European countries, like Spain, Italy and Malta, that in previous decades generated emigrants, have over the last five years been the main destination for new immigrants[3] resulting in a rapid increase, over a short period of time, in the population of their largest cities. This has resulted in pressures on the health, social and educational services to meet this new and complex demand. Health services (including those involved with CD) need to adapt to these new demands produced by migration flows and the ageing process in order to avoid impoverishment of current public service capacities[4].

There has been some concern about the risk of importing infectious cases via immigration[5]. However, perhaps the more important issue is to avoid creating new sub-populations exposed to the increased risks related to certain (poor standard) working and living conditions, which could result in strong social and economical determinants for potential outbreaks within these migrant communities[6,7].

Living in healthy cities?

Cities are the main living environment of the European population. The countries where a significant proportion of people still lives in the countryside are Slovenia, Slovakia, Latvia, Finland, Ireland and Greece[8].

Over recent decades the patterns of urbanisation and integration of internal (rural to urban) and external migration have resulted in the existence of 'impoverished inner-city areas' in many European cities. Without any interventions these areas can play a significant role in the spread of

CD and in outbreaks. Several cities, individually and collectively through European local and regional networks (e.g. Healthy cities[9], Megapoles[10], EUREGHA[11] and Eurohealthnet[12]), have tried to ensure that health issues are included in urban planning agendas, including the use of health impact assessments.

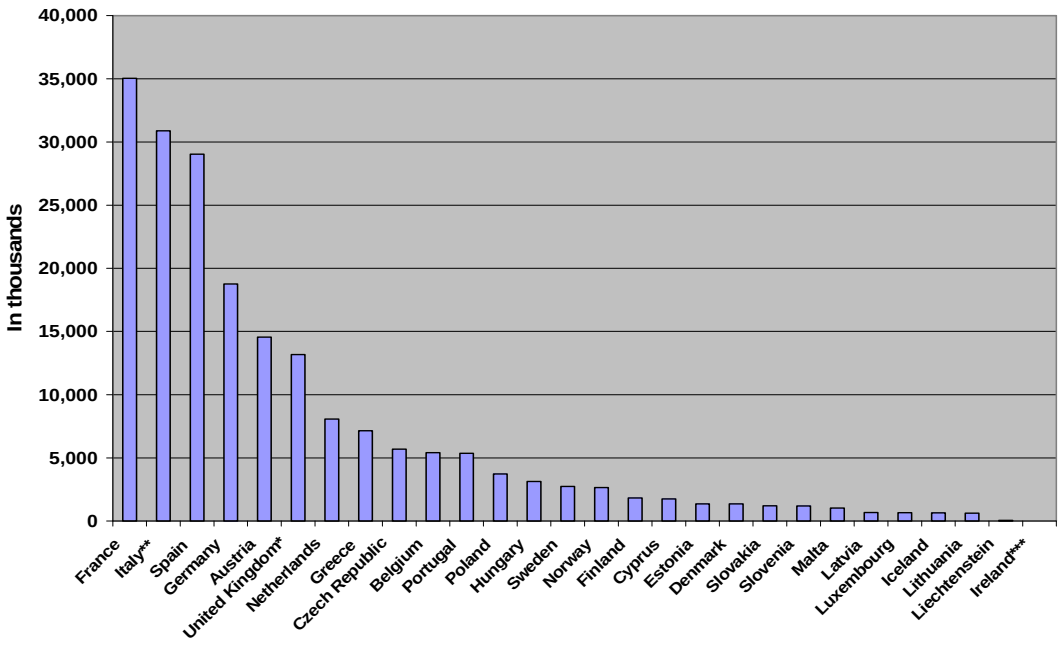
Increased tourism and travel

Tourism is one of the most important sectors of many European countries' economies[13], contributing to both community and national development. However, the increased frequency of travel has also resulted in greater vulnerability to the transmission of old, new and re-emerging infectious diseases[14].

According to Eurostat[15], in 2004 about 197 million EU citizens made around 408 million trips. Germany is the main source of tourists (59 million in 2005), followed by France (30 million), UK (29 million) and Italy (24 million)[16]. On the other hand, the preferred destination countries are France, Italy and Spain[17] (figure 3.1.3).

Global travel (including tourism, migration, refugees and business travel) has grown from 25 million travellers in 1950, to 341 million in 1980 and 500 million in 1993, and is estimated to reach 1 billion by 2010[18]. The process of globalisation will continue to increase travel, especially by air, connecting, in hours, extremes of the world, with their different social environments and microbiological ecosystems. Travel is often a very important risk factor in the transmission of infectious diseases although there are severe limitations on the relevant surveillance data. It will continue to increase in significance in the coming years.

Figure 3.1.3. Tourism: arrival of non-residents in hotels and similar establishments, 2005



Source: Eurostat. *UK 2004; **IT provisional ***IE not available.

Globalisation of trade in food and animals

Continued globalisation broadens our exposure to a variety of micro-organisms and makes the prevention and control of zoonoses and food-borne diseases that much more difficult. The EU25 share of world trade (import and export) was 19% in 2005 (the same as USA and double that of Japan or China)[19]. Asia is the main world partner region of the EU25, with trade of more than 700 billion euro in 2004 followed by America, with almost 550 billion euro. Maritime transport was by

far the most frequently used mode of transport for imports of agricultural products and live animals (61%) and foodstuffs and animal fodder (89%) into the EU during 2004[20].

Inequalities in wealth and health

Although Europe continues to become wealthier overall, inequalities persist, not only between European countries, but also within the country's towns and cities (especially less developed regions and neighbourhoods), between social groups and also between Europe and neighbouring countries. Interventions focused on dealing with certain socioeconomic determinants of CD risks and outbreaks can help to increase overall security and minimise risks (apart from addressing the inequity considerations).

Differences within countries should also be considered, giving special attention to the less economically developed areas in Europe. Regions of relative wealth coexist with those less economically developed[21]. Even broader gaps can be found inside the biggest European cities.

Regarding the evolution of income inequality levels over the last decade, some indicators suggest that social cohesion may not have strengthened much across the EU over this period[22]. Income inequality in wealthy European countries was found to be strongly associated with higher mortality among infants and significantly associated with CD[23].

Some 15% of European Union citizens are regarded as being poor. Relative poverty rates in the EU25, range from 8% in the Nordic countries, Czech Republic and Slovenia to 21% in Greece, Ireland and Slovakia. There seems to have been some convergence in the extent of poverty across the EU15 since the mid 1990s, though no overall reduction can be observed[24].

The complex social, political and economic changes beyond the European Union's borders in the neighbouring countries are potentially significant to the EU. These countries include those on the eastern border, like Russia, Ukraine and Belarus, all societies in political transition[25], but also to the south, where the Mediterranean Sea is both a real geographic and a symbolic barrier, marking the enormous social, economical and cultural gap between EU and north and sub-Saharan African countries. Countries like Spain, Malta and Portugal are nowadays one of the main entry points for these recent economic migrants.

Trends in working and living conditions

In 2004, about 10% of the population aged between 18 and 59 years in the EU25 lived in jobless households[26]. In some European countries unemployment rates have decreased, but with an increase at the same time of low-quality jobs (short-term contracts, low occupational health conditions, instability, etc) with an attendant potential increase in health risks.

In the EU, work-related stress is now believed to affect one-third of the workforce[27]. People living under long-term stress are known to be more vulnerable to a wide range of conditions, including CD, probably through a weakened immunity mechanism[28].

Housing is an important determinant of health, with substandard housing and poor living conditions (overcrowding, bad temperature comfort, indoor air pollution, inadequate sanitation and water supplies, poor food safety standards, presence of vectors, etc) posing significant threats to health in general, and a risk for CD in particular[29]. There is a higher level of overcrowding in southern countries[30]. On the other hand, some central and eastern European countries have experienced dramatic changes in their housing arrangements, due to large-scale privatisation of the housing sector resulting in visible deterioration of housing stock and lack of repairs[31,32]. In countries in western Europe, problems with housing are prevalent, especially old housing stocks, although these are not as evident[33].

The prevalence of homelessness varies across countries. However, it appears to have increased in Europe since the 1980s, particularly among young people and women[34]. There is clear evidence of the significantly poorer health status of homeless people when compared to the general population, including some CD, like HIV and tuberculosis[35]. Homeless people tend to have problems obtaining adequate health care and may experience barriers to access, due to discrimination, appointment procedures, and financial constraints[36]. Conditions requiring

uninterrupted treatment such as TB and HIV are often inadequately controlled and difficult to manage without a stable residence.

Nomadic and semi-nomadic populations like the Roma (also known as Romani or Gypsies) form another vulnerable and at-risk community for CD. The estimated population across the EU is 8–12 million, mainly concentrated in central and eastern Europe. Despite the small number of studies[37], it is estimated that the life expectancy of Roma is shorter on average by ten years than that of the rest of the population and that the child death rate is up to four times higher[38] and also that their exposure to certain CDs is higher[39].

3.2 Health services in Europe in relation to communicable diseases

An increasing awareness of the new challenges posed by the re-emergence of 'old' communicable diseases, together with the new threats which emerged from increasing globalisation, international trade and population movements (especially migration and refugees), has stimulated the strengthening of CD-related health resources in the EU.

Surveillance has traditionally been seen as mainly a national responsibility, but in the last decade, an EU 'network approach' has stimulated the establishment of disease-specific 'dedicated surveillance networks' (DSNs). Many of these networks have been successful in following trends and detecting international outbreaks[40], but so far many of them have continued to work in isolation with no mechanism to coordinate their individual efforts. The creation of ECDC is a recent milestone in the construction of a new European public health capacity designed to cope with these new challenges. Clearly, its effectiveness will depend not only on the ability of the national surveillance systems to give valid information, but also on the capacity of the health systems of EU Member States to prevent, detect, treat and control CD.

An exercise to map the strengths and weaknesses of the European health services related to CD should be carried out in the next years[41]. This should allow us to answer the question: *How well do the health services of Europe protect against communicable disease?*

One of the main difficulties of such an analysis is the variety of organisational models[42] across Europe, products of different historical and political contexts and values (e.g. countries differ in the relative emphasis they place on individual and collective actions[43]). There are even differences in the meaning of terms like 'public health' in the different countries[44], which can be seen as indicative of different conceptual and operational frameworks. Differences in public health policies have a clear impact on the national approaches to CD prevention and control. This is well documented in the area of STI, where there is a clear heterogeneity of current surveillance systems[45], policies and programmes[46] and even practices[47].

The national capacities and resources for CD control[48] appear to be generally of a good standard in Europe. There is a very strong tradition of public health in the EU, with dedicated and highly professional epidemiologists and some of the best public health laboratories in the world. However, there are wide differences between the Member States when it comes to resource allocation, with the necessary resources often lacking in the countries with the highest disease incidences.

Any discussion of health services should include some consideration of the public accessibility to these services, identifying and removing spatial, financial and cultural barriers. Differences in access to health services across socioeconomic groups may exacerbate existing health inequalities and make proper coverage of CD prevention and control measures difficult[49].

Organisational levels of the CD-related health services

Primary health care

Primary health care (PHC) has been a traditional ally and strategic partner of the public health services. PHC is not only important because the information gathered at the first contact level of the health care system is vital for surveillance, but also because both 'cultures' share a community-oriented framework and a prevention focus. At its core, PHC operates at a more

collective and prevention-oriented framework, represented and based on the spirit of the Alma Ata Declaration[50] that promoted the concept of thinking beyond mere individual clinical demand.

A broad range of health care reforms have occurred in Europe since the early 1980s, many of which have affected primary care. Examples of such reforms are the Primary Health Care Reform in Spain, the introduction of general practitioner (GP) fund-holding and the later Primary Care Groups and Trusts in the United Kingdom, revised family doctor systems in Sweden and Finland, and new policies in Germany, France, Norway and Finland leading to voluntary patient list systems and a stronger coordinating role for GPs[51].

Several differences between countries have a clear impact on their CD prevention and control capacities: the comprehensiveness of care offered (range of services, e.g. the inclusion or otherwise of preventive services), the continuity of care (e.g. systems with or without patient lists per GP), the type of first contact care (e.g. GP's gate-keeping or countries with parallel access to medical specialists), home care services (i.e. home nursing and home help services), mode of employment and payment for healthcare workers (e.g. self-employed or salaried GPs), teamwork culture (cooperation or competitiveness) and the cost of services for the user (e.g. fee-for-service basis, free access or moderating tickets). For example, population-oriented preventive screening programmes are unlikely to be provided under simple capitation payment systems. This is because such programmes are not demand-driven, so that additional incentive payments would be required[52]. Primary care practitioners, mainly the GPs, have a huge role in dealing with the problem of antimicrobial resistance (AMR), as the bulk of antibiotic prescribing is carried out in this sector.

Increasing availability to new information technologies and laboratory tools at the PHC level provides new opportunities for future CD prevention and control capacity. Information systems based on electronic communication technology in health centres (especially with the introduction of computerised medical records) lead to easier registration, notification and information-sharing, with obvious benefits for the surveillance systems. The availability of serological tests and other laboratory tools to diagnose CD, especially vaccine-preventable diseases, avoids dependence on hospitals and facilitates confirmation and subsequent reporting of cases.

Hospital-based care

Hospitals are crucial partners for CD control, due to their personnel and material resources (e.g. microbiological laboratories, specialised staff in CD) and experience in dealing with CD. Europe has extremely diverse hospital and health care systems. The directions of hospital reforms in Europe during last decades were also diverse. Some were focused on devolving a high degree of autonomy to the individual hospitals and introducing new management systems. Although with obvious benefits from a managerial aspect, sometimes this has led to some degree of isolation from the rest of the health care system and especially from the public health system, making it difficult for these hospitals to share the objectives of improving the health of the population where they are located. Experience from several countries indicates that collaboration between hospitals and public health services is easier when undertaken within a regional planning mechanism[53]. The emerging significant threat of healthcare-associated infections becomes more difficult to tackle with this tendency of increasing independence of the hospital sector.

Social services and other strategic sectors outside the healthcare system

Social services have a high capacity to access populations at higher risk for CD and to mobilise resources. Although there has sometimes been an insufficient coordination, there is a growing awareness about the need for a collaborative framework between social and health services. Several public administrative services and functions (e.g. educational, environmental risk management, housing, urban planning, working conditions inspection, agriculture and cattle) have a strategic impact on CD and are potentially very efficient at up-streaming intervention (housing, environment, etc.) for the prevention and control of CD.

CD-related health services according to public health functions

Another approach to analyse the health systems' capacity to prevent and control CD is to check the development of relevant public health functions (detection, prevention, control, and treatment) included under each organisational level.

Primary prevention

The first line of defence against CD in Europe lies in primary prevention, aimed at avoiding risks of infection. Important primary preventive actions include public health advocacy about socioeconomic risk factors, vaccination programmes and specific interventions like blood safety.

Inequality of health is another important determinant supported by an increasing interest in research on this topic. Public health services are in the process of redefining their roles in highlighting and communicating the relationship between CD and social and economic determinants, advising policymakers about necessary interventions and evaluating the health impact of public policies. Introducing variables describing social status in our health information systems is a basic need to fulfil these functions.

Over the past two decades, a long series of specific and non-specific measures (e.g. tighter selection of blood donors) have been introduced into the screening of blood donations in order to reduce the residual risk of transmission of blood-borne viruses[54]. The EU's Blood Directive (2002/98/EC) and the legislation implemented under it were an important step towards ensuring an equivalent standard of quality and safety of blood and blood components, whether used for transfusion or as the base material for the manufacture of medicinal products, throughout the EU.

Immunisation

Vaccination is extremely cost-efficient, and has probably contributed more to the improvement in public health in the last 100 years than almost any other measure. The coverage of the basic childhood immunisation programmes is generally good in the EU, although pockets of low vaccine uptake persist, which pose a substantial risk for future outbreaks. More needs to be done when it comes to adult vaccination. For example, the uptake of the seasonal influenza vaccine has generally remained at too low a level. With the licensing of an increasing number of new, relatively expensive vaccines, a serious review of vaccine use is likely to occur in the coming years.

In general, developing standardised surveillance methodologies remains a big challenge for Europe[55]. Immunisation coverage is one of the most important indicators for monitoring vaccination programmes' performance and to properly interpret surveillance data about vaccine-preventable diseases. Wherever computerised vaccination registries are not present, monitoring immunisation coverage is a more complex task.

Surveys performed within the EUVAC.NET project[56, 57] regarding monitoring of measles and pertussis vaccine coverage highlighted this need for homogeneity in order to improve data comparability. ECDC shall support Member States in defining common standardised methods to measure vaccination coverage and encourage the implementation of comprehensive computerised information systems that could link data on vaccination coverage with those on disease surveillance and vaccine safety.

Serological surveillance[58] is a promising technique for obtaining information about the immune status of the European population and for properly assessing the vaccination programmes. It could also assist in predicting the need for future catch-up programmes.

There is a wide variation among national childhood immunisation schedules and vaccination recommendations in Europe, of which MMR and BCG[59] vaccinations are examples. ECDC will work with Member States and the Commission to develop a sound scientific basis for considering harmonising vaccine strategies and schedules wherever possible.

Secondary prevention

Secondary prevention activities are generally aimed at the early detection of infection, thereby increasing opportunities for prompt treatment and decreasing the risk of secondary transmission. Screening is either aimed at the early detection of specific diseases, e.g. HIV infection and tuberculosis[60], or aimed more generally at finding disease in vulnerable groups such as immigrants or migrants[61,62] The actual practices vary enormously between Member States, reflecting their different traditions, e.g. between the old and new Member States, and different epidemiological situations.

Case detection and reporting

New approaches have been developed to enhance the case detection capacity of CD surveillance systems that range from detection through sentinel networks[63] or using information from sources external to the health system (e.g. the tourism industry detecting and analysing cases and outbreaks among tourists[64,65]).

Clinical microbiology laboratories play an important role in the early detection and confirmation of disease, the agent identification, and notification to the appropriate authorities. To be more effective in this role, laboratories must be specially prepared to handle agents safely, and have the appropriate rapid and sensitive diagnostic testing systems[66]. Laboratories' full participation in reporting is a crucial element of surveillance systems. Further extension of the electronic data transfer systems can facilitate networking of laboratories and speed up notification to the responsible health authorities. Elsewhere, electronic reporting has been shown to be faster, less labour-intensive and more complete than traditional disease reporting. Several countries may need to look carefully at how best to improve their national standards of electronic disease-reporting to be able to compare their data with Member States like the United Kingdom, Germany, the Netherlands and Sweden, where such systems are already in place[67].

Better detection of cases and outbreaks could probably be achieved by working to reduce some of the strict data protection laws and by attempting to convince the medical profession that its independence is not threatened by these new public health information systems. This should help to avoid incomplete notifications or unrecorded and uninvestigated outbreaks[68,69].

Over the last decade several electronic national surveillance systems[70] and specific disease networks have been introduced, with some even implementing a web-based reporting system. The benefits in terms of improved timeliness and completeness compared with conventional records, have been clearly demonstrated[71]. The increasing interconnection between PHC centres, hospitals[72] and laboratories[73] should ensure a higher quality of data for surveillance purposes.

Patient treatment

Patient treatment is being increasingly hampered by the rapid emergence of AMR and various HCAI. AMR is a complex multi-factorial phenomenon, requiring multi-level control measures. Effective control also requires close cooperation between clinicians, laboratory scientists, epidemiologists, and public health practitioners[74]. Within the hospitals, strict enforcement of hygiene practices is imperative for the successful fight against HCAI, which are often caused by multi-resistant bacteria. As AMR is immensely costly once established, there is much is to be gained by implementing counter measures at a very early stage.

Outbreak detection and investigation

Good surveillance systems are vital to achieve the overview necessary to detect outbreaks, follow disease trends and assess the effectiveness of preventive measures. Increasing global travel and trade call for surveillance even at the international level. It is performed both within statutory and non-statutory notification systems[75], and as case-based surveillance and sentinel surveillance. A specific part of surveillance is 'epidemic intelligence' activities (see Chapter 6) aimed at detecting health events like outbreaks, rather than single cases. The organisation of national surveillance geared at outbreak detection is, in principle, similar between the Member States, although

sometimes organised in different vertical programmes, e.g. for tuberculosis or HIV. In practice, the differences in performance between the national systems are often so large that direct comparisons of incidence are meaningless. This is one area that will require specific studies to introduce the necessary improvements.

Evaluation

In the near future useful information should be available to clarify not only the resources required, but also the functionality of our health systems in meeting the challenges related to CD. Some examples are the ongoing development of plans and assessments of the preparedness for pandemic influenza at the national and sub-national levels, evaluations of current specific surveillance systems, bioterrorism preparedness and response assessments[76] and the use of some CD healthcare quality indicators (like avoidable mortality caused by CD[77]).

Training and research

The resources for outbreak investigation and control differ largely between the Member States, as does the quality of the outbreak investigations. There is an urgent need for better training in practical analytical epidemiological methods. National Field Epidemiology Training Programmes (FETPs)[78,79] as well as the European Programme for Intervention Epidemiology Training (EPIET)[80] have been successful in creating a European cadre of well-trained field epidemiologists. However, the limited number of persons graduating from these programmes every year is far from meeting the demands. Short courses aimed at updating regional and national epidemiologists are also needed to complement the existing programmes.

The increasing public concern about the importance of CD has prompted a resurgence in research in this field within the EU. Overall, the scientific production and repercussion index of the EU's research on infectious diseases experienced a notable rise during the last decade of the 20th century[81].

Communication and participation

Information is one of the main products of CD prevention and control activities. There is a great deal of interest in finding the best ways to communicate this information to society and decision makers. Apart from the importance of working with mass media and using available internet resources (e.g. institutional websites[82]), there is still the need to explore new ways of improving public access to relevant CD information, to learn the most appropriate way to communicate risks and of how to increase the transparency of this communication process.

European actions and resources

European Union

Initiatives of the European Commission in the field of communicable diseases could be divided into two categories: providing grants to research within the research framework programmes (Directorate-General for Research), and funding public health activities within the Public Health Programmes (DG Sanco). Commission initiatives have been instrumental in bringing the countries' scientific and professional sectors closer together. Under Decision 2119/98 of the Parliament and the Council and subsequent Commission Decisions, a Community Network for the epidemiological surveillance and control of communicable diseases in the Community brought the Commission and the Member States together to create an Early Warning and Response System (EWRS) and set standards for EU-level surveillance of communicable diseases (setting out a list of diseases, case definitions, and procedures for the DSNs). The Public Health Programme has also funded important infrastructural networks such as the EPIET, the scientific publication *Eurosurveillance*, and the two regional networks EpiNorth and EpiSouth, operating at sub-regional levels in neighbouring geographic areas. Following major crises and health threats such as SARS, and in preparation to meet the challenges of a next possible influenza pandemic, the Commission took the initiative to move to a next level and provide for the integration of all these initiatives by setting up a new Centre for Disease Prevention and Control – which was then established in 2004 and became operational on 20 May 2005 – to provide the necessary EU-level

capacity in surveillance, preparedness and response, training, and the provision of scientific advice. ECDC collaborates actively with several of the other European institutions and agencies in related fields, such as food safety (EFSA), medicines (EMEA), environment (EEA), drug dependency (EMCDDA), and with regard to minority groups, the EU Agency for Fundamental Rights (FRA, formerly the EUMC).

World Health Organization

Among the intergovernmental organisations, the World Health Organization (WHO) is the most important ally in the prevention and control of communicable diseases. Within the EU zone the mandate of WHO and ECDC are different but complementary to each other. Through successful collaboration, duplication of work can be minimised and eventually eliminated, with the work becoming more complementary. Indeed, as the European Region of WHO includes 53 countries, WHO has focused most of its work outside the EU27. Examples of successful areas of collaboration between WHO and the EU include outbreak investigations within the WHO Global Outbreak and Response Network (GOARN), surveillance, and polio eradication.

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4 Epidemiological situation of communicable diseases in Europe

This chapter is divided into 51 sections, each dealing with a particular communicable disease or disease group. Each section ends with a summary table describing some features of each country's surveillance system dealing with that particular disease, apart from the exceptions below.

All the surveillance systems are described except for avian influenza (section 4.4).

The tables use the following abbreviations:

A	Aggregated
Ac	Active
C	Compulsory
C-B	Case-Based
Co	Comprehensive
Hosp	Hospitals
Labs	Laboratories
N	No
Pa	Passive
Phys	Physicians
Se	Sentinel
U	Unknown / Not specified
V	Voluntary
Y	Yes

A general summary of the main data on communicable diseases in Europe is presented in the following tables B and C.

Table B. Incidence of reported cases (per 100 000) per country in 2005 (EU and EEA/EFTA Member States)

— = no available data; NC = countries reporting disease, but the cases are non-confirmed. The total incidence refers to reporting countries only.

Due to large differences between the national surveillance systems, the figures are not comparable between the countries. Low numbers could be due to genuinely few infections or a high degree of under-reporting and conversely, high numbers could be due to many infections and the consequence of a highly effective surveillance system. For several diseases, a large proportion of the reported diseases are imported. For details please refer to the full Epidemiological Report.

	Austria	Belgium	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherland	Poland	Portugal	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Iceland	Liechtenstein	Norway
Anthrax	0	<0.1	0	0	0	0	—	—	0	<0.1	0	0	0	0	—	—	0	0	<0.1	0	0	0	0	—	0	0	—	0
Botulism	<0.1[a]	0	0	<0.1	0	0	—	<0.1	<0.1	0	<0.1	—	<0.1	0	0.15	—	0	—	<0.1	<0.1	—	<0.1	0	<0.1	<0.1	0	—	0.1
Brucellosis	<0.1	<0.1	0.3	<0.1	0	0	<0.1	<0.1	<0.1	1.1	<0.1	1.3	1.2	0	0	0	0	<0.1	<0.1	1.4	0	0	0.5	0.2	<0.1	—	—	<0.1
Campylobacteriosis	62	65.9	0	296.2	68	9.2	76.4	3.3	75.3	—	82.1	43.9	0.6	0	20.3	42.6	22.6	23.1	0.1	—	40.9	51.9	12.9	75.4	88	46	—	57.2
Chlamydia inf.	3.7	20	0.1	—	441.3	189	—	—	—	—	5.8	—	—	27	16.4	—	12	—	0	—	2	11.5	0.3	367	196.5	552.5	—	433.4
Cholera	0	<0.1	0	0	0	0	—	—	—	0	0	—	0	0	—	—	0	<0.1	0	<0.1	0	0	0	<0.1	<0.1	0	—	<0.1
vCJD	0	0	0	0	0	0	—	<0.1	—	0	0	<0.1	—	0	—	0	0	<0.1	0	0	0	0	0	0	<0.1	0	—	0
Cryptosporidiosis	—	3.4	0	<0.1	—	0	—	—	1.6	—	0	13.8	—	0	0	—	1.5	—	0	—	0	0.5	0.3	0.8	9.3	—	—	—
Diphtheria	0	0	0	0-	0	0	—	—	—	0	0	0	0	0.9	—	—	0	0	0	0	0	0	0	—	0	0	—	0
Echinococcosis	0.1	<0.1	0.1	<0.1	—	0	—	<0.1	0.1	<0.1	<0.1	0	—	0.2	0.4	0	0	—	<0.1	<0.1	<0.1	0.3	0.2	0.1	<0.1	—	—	<0.1
EHEC / VTEC	0.7	0.5	0	16.7	2.9	1.4	0.4	0.2	1.4	..	<0.1	3.3	<0.1	0	0	1.8	1.2	0.4	<0.1	—	1.1	2.4	<0.1	4.3	2	0.3	—	0.4
Giardiasis	—	13.7	0.1	0.9	—	24.3	—	—	5.3	—	0.3	1.4	—	0.4	1.3	—	0.3	—	8.5	—	1.3	1.2	1.3	12.8	5.4	14.6	—	9.2
Gonorrhoea	8	4.2	2.1	8.4	8.2	21.4	4.5	—	—	—	8.4	—	0.7	30.1	12.6	0.2	5.7	—	1	0.4	2	2.3	0.4	7.7	34	6.5	—	6

Haemophilus influenzae type b (invasive)	<0.1	0.7	0	0.2	<0.1	1.5	—	0.8	<0.1	<0.1	<0.1	0.4	<0.1	0	0.6	0	0	—	0.2	0.1	0.1	0.3	<0.1	1.3	0.2	0	—	0.1
Hepatitis A	2	2.3	1.2	3.2	0.9	1.3	0.5	—	1.4	1.4	2.8	1.2	2.2	6.3	2.2	—	1.5	1.3	0.1	2.3	9.8	0.5	1.8	1	0.8	0.3	—	1.2
Hepatitis B	7	5.3	0.8	3.5	0.5	5.8	—	0.2	1.4	0.8	1.2	1.8	1.8	7.4	4.1	1.1	3	1.8	1.2	0.9	2.3	0.9	1	2.4	0.7	11.2	—	3.2
Hepatitis C	10.9	8.9	0.5	8.3	5.7	6	—	—	9.5	0.1	0.2	35	—	4.8	2	4.4	2	0.2	7.9	0.9	0.5	0.5	0.6	29	17.5	15	—	0.7
HIV infection	5.5	10.2	5.2	0.8	5.3	46.7	2.6	9.9	3	5	1.1	7.7	2.1	13	3.5	13.6	4.7	7.5	1.7	25.1	0.4	1.8	—	4.3	14.8	2.7	—	4.7
Legionellosis	0.8	1.7	0	0.1	2.1	0.2	—	—	0.6	0.2	0.1	0.2	1.5	0	<0.1	—	1.2	1.7	<0.1	0.4	<0.1	1	2.2	1.2	0.6	2.4	—	1.9
Leptospirosis	0.1	0.1	0	0.5	0.2	0.8	<0.1	0.8	<0.1	0	0.3	0.4	<0.1	0.4	0.2	—	0.7	0.2	<0.1	0.3	0.7	0.4	0	<0.1	0.1	—	—	—
Listeriosis	0.2	0.6	0	0.2	0.9	0.2	0.7	0.4	0.6	<0.1	0.1	0.3	0.1	0.1	<0.1	0	0	0.6	<0.1	—	<0.1	0.2	0.2	0.5	0.4	0.3	—	0.3
Malaria	0.7	2.6	0.3	0.2	1.6	0	0.5	—	0.7	0.2	0	1.1	1.1	0.2	0.1	0.7	0.5	1.9	0.1	0.5	0	0.4	0.7	1.3	2.9	0	—	0.8
Measles	0.1	0.3	0.1	0	<0.1	0.2	0	<0.1	0.9	0.3	<0.1	2.3	0.4	<0.1	0	0	0.5	<0.1	0	<0.1	0	0	<0.1	0.1	0.1	0	—	0
Meningococcal inf. (invasive)	1.3	2.1	0.5	1	1.6	1	0.7	1.1	0.8	1.7	0.3	5	0.6	0.8	2.4	0.9	2.7	1.5	0.5	1.3	0.8	0.8	1.6	0.6	1.8	1.7	—	0.9
Mumps	0.3	0.7	0.7	17.6	0.2	2.2	—	—	—	<0.1	0.1	14.5	4.2	0.2	3	0.2	0.5	—	0.3	0.2	0.2	0.3	0.6	0.9	77.2	29	—	0.2
Pertussis	1.7	1.6	0.8	4	2.4	4.7	—	—	—	<0.1	0.2	2	1.4	0.7	1.9	0	0.7	40.2	4.2	0.7	0.3	3.8	0.3	15.1	0.6	2	—	19.1
Plague	0	0	0	0	0	0	—	—	0	0	0	0	0	0	—	—	0	0	0	0	0	0	0	0	—	0	0	0
Pneumococcal inf. (invasive)	1.8	15.5	1.1	0.6	2	2.1	—	10	—	—	0.6	6.3	0.5	—	1.1	—	1.7	—	0.4	—	0.6	2.2	2.2	15.8	11.9	—	—	23.6
Polio	0	0	0	0	0	0	—	—	0	—	0	0	0	0	—	—	0	0	0	0	0	0	0	0	—	0	0	0
Q fever	—	0.1-	0	<0.1	—	0	—	0.5	0.5	<0.1	0.1	0.2	—	0	0-	0	0	<0.1	0.1	<0.1	0	0.2	0.3	<0.1	<0.1	—	—	—
Rabies	0	0	0	0	0	0	—	—	0	0	0	0	0	0	—	—	0	0	0	0	0	0	0	0	0	0	0	0

Rubella	<0.1	—	0	<0.1	0	0.5	—	—	—	0	<0.1	0.4	0.5	1.5	3.4	0	0.7	2.2	<0.1	0	<0.1	0	1.1	0	<0.1	0	—	<0.1
Salmonellosis	68.4	47.1	7.9	322.2	33.2	23.2	47.3	9.4	63.3	9.4	77.4	8.5	13.7.	27.7	68.6	46.4	16.4	8.5	39.4	4.4	223.7	71	16.3	39.6	21.1	31	—	32.2
Shigellosis	1.4	4.1	0.1	2.8	3	7.3	2.2	1.3	1.4	0.2	0.8	0.9	—	8.1	13.4	1.3	0	2.6	0.2	<0.1	9.5	1.7	0.5	6.3	2.5	1.7	—	3.6
Syphilis	3.3	3.4	2.8	5.1	2.1	8.3	2.7	—	3.9	0	5.4	—	2.4	19.2	8.6	4.8	4	—	1.6	0.9	3.1	2	1.2	1.2	6.5	1	—	0.5
Tetanus	0	<0.1	0	0	0	0	—	<0.1	—	<0.1	<0.1	—	0.1	0	—	—	0.3	—	<0.1	<0.1	0	0.1	<0.1	<0.1	<0.1	0	—	0
Toxoplasmosis	—	—	0	3.4	—	0.4	—	—	—	0	1.1	1.1	—	0.1	6.9	—	2	—	0.8	—	4.9	1	0.1	—	0.2	—	—	—
Trichinellosis	0	—	0	0	—	<0.1	0	<0.1	0	0	0	0	<0.1	2.1	0.4	0	0	0	0.1	0	0	0	<0.1	0	0	—	—	0
Tuberculosis	11.6	11	4.4	9.9	7.8	39	6.9	8.6	7.3	6.9	20	11.1	7.1	62.5	75	8	5.7	7.1	24.1	33.7	14.1	14.1	18.2	6.3	14.2	3.7	—	6.3
Tularaemia	<0.1	0	0	0.8	—	0	—	<0.1	<0.1	0	0.9	0	0	0	0	0	0	—	<0.1	—	0.4	<0.1	0	2.7	—	—	—	0.4
Typhoid/paratyphoid fever	0.2	0.6	0.7	<0.1	0.7	<0.1	—	0.2	0.2	0.2	<0.1	0.1	0.4	<0.1	0.1	0	0.3	0.2	<0.1	0.7	<0.1	0	0.1	0.3	0.8	0	—	0.9
Yellow fever	0	0	0	0	—	0	—	—	0	0	0	—	0	0	—	—	0	0	0	0	0	0	0	0	0	0	—	0
Yersiniosis	1.2	2.9	0	4.9	4.5	2.3	12.2	0.3	6.8	—	0.4	<0.1	—	2.2	14.6	0.2	0	—	0.3	—	1.2	1.4	0.8	8.2	0.1	—	—	2.8

(a) Probable cases

Table C. Reported number of cases in the EU and EEA/EFTA Member States 1994–2004

The numbers should be interpreted with caution, as increasing numbers could reflect both a true increase and improved performance in the surveillance systems. For several diseases, a large proportion of the reported diseases are imported.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Anthrax	23	8	25	21	33	38	28	28	19	27
Botulism	271	240	215	245	246	261	174	298	225	213
Brucellosis	2 909	3 152	4 088	3 771	3 971	3 022	2 667	2 387	1 705	1 743
Campylobacteriosis	85 130	91 285	105 797	149 561	152 617	170 065	193 708	186 780	170 218	182 598
Chlamydia infection	97 858	103 955	111 256	118 151	129 803	148 533	164 152	181 484	188 381	208 807
Cholera	36	30	25	40	18	18	21	12	14	23
vCJD	10	12	14	17	30	25	19	17	6	15
Cryptosporidiosis	6 814	4 760	5 724	5 163	6 456	7 833	6 389	4 940	8 413	6 164
Diphtheria	448	156	55	72	89	272	95	57	30	26
Echinococcosis	717	759	578	560	485	370	419	417	398	370
EHEC (VTEC)	3 209	3 046	3 714	3 597	6 893	6 847	8 675	9 196	9 170	9 773
Giardiasis	12 788	11 891	12 794	11 614	11 380	10 196	13 833	12 267	12 232	17 101
Gonorrhoea	35 602	32 197	29 525	28 270	28 474	35 328	34 258	34 306	33 556	31 133
HiB (invasive)	841	912	938	906	859	931	1 065	1 050	1 069	1 013
Hepatitis A	25 885	37 759	45 977	33 436	16 614	11 196	12 469	8 544	8 423	9 379
Hepatitis B	24 414	24 430	27 126	25 450	19 074	19 719	17 195	15 906	15 022	12 648
Hepatitis C	10 686	11 706	15 971	22 427	23 554	22 476	27 638	26 536	27 450	27 137
HIV infection	7 419	7 410	7 246	8 074	8 079	9 703	13 987	16 034	18 211	24 533
Legionellosis	588	817	1 233	1 462	2 263	2 421	3 763	4 791	4 503	4 635
Leptospirosis	451	783	752	826	856	750	900	1 022	696	688
Listeriosis	669	615	701	506	737	777	961	987	1 148	1 216
Malaria	6 533	8 062	8 619	8 750	9 907	10 366	10 050	9 198	8 238	7 680
Measles	114 209	118 724	129 222	29 617	26 051	14 632	15 975	28 747	24 692	5 944
Meningococcal inf. (invasive)	6 443	7 566	9 182	7 841	8 804	8 907	8 210	7 407	6 718	5 722
Mumps	225 811	197 621	189 001	274 197	169 324	94 358	70 370	63 460	108 669	160 783
Pertussis	33 792	23 702	24 283	21 519	19 920	23 322	19 381	19 775	13 817	27 041
Plague	0	0	0	0	0	0	0	0	0	0
Polio	4	4	0	2	1	1	1	0	0	0

Q fever	1 961	1 809	1 556	1 529	2 094	1 339	1 415	1 645	1 687	1 216
Rabies	0	7	2	0	0	2	3	2	2	3
Rubella	96 693	133 753	180 765	59 429	37 210	51 994	91 979	53 334	13 105	5 807
Salmonellosis	362 872	329 318	320 881	316 227	280 495	244 370	243 415	225 330	213 184	197 050
Shigellosis	24 568	16 572	16 591	13 605	12 695	13 356	14 064	11 200	10 172	10 645
Pneumococcal inf. (invasive)	14 843	17 350	17 845	16 209	15 985	16 498	16 343	15 380	17 966	17 588
Syphilis	12 254	13 445	12 747	10 828	9 299	8 736	10 412	11 701	12 564	13 424
Tetanus	342	327	289	267	260	246	194	165	205	165
Toxoplasmosis	3 042	3 125	2 643	2 341	2 427	2 231	1 845	2 276	1 911	1 678
Trichinosis	618	341	283	1 243	435	218	259	153	151	254
Tuberculosis	82 674	80 826	78 608	76 621	73 270	70 991	66 557	63 074	18 173	82 674
Tularaemia	991	710	962	662	589	1 646	282	625	1 685	557
Typhoid fever	3 137	2 944	2 269	2 091	2 371	1 796	1 667	1 374	1 536	1 559
West Nile virus infection	0	0	5	0	0	0	0	0	7	0
Yellow fever	0	0	0	2	2	0	2	0	0	0
Yersiniosis	4 030	4 020	7 198	10 475	9 279	8 525	11 147	11 420	10 292	10 251

The following population estimates were used as the denominator in determining the crude incidence of the diseases:

Country	**Population 2005**	**Country**	**Population 2005**
Austria	8 206 500	Lithuania	3 425 300
Belgium	10 445 900	Luxembourg	455 000
Cyprus	749 200	Malta	402 700
Czech Republic	10 220 600	Netherlands	16 305 500
Denmark	5 411 400	Poland	38 173 800
Estonia	1 347 000	Portugal	10 529 300
Finland	5 236 600	Slovakia	5 384 800
France	62 370 800	Slovenia	1 997 600
Germany	82 500 800	Spain	43 038 000
Greece	11 075 700	Sweden	9 011 400
Hungary	10 097 500	United Kingdom	60 034 500
Ireland	4 109 200	Iceland	293 600
Italy	58 462 400	Liechtenstein	34 600
Latvia	2 306 400	Norway	4 606 400

Source: Eurostat.

4.1 HIV/AIDS

The human immunodeficiency virus (HIV) remains one of the most important communicable diseases in Europe. It is an infection associated with serious morbidity, persistently high costs of treatment and care, significant mortality and shortened life expectancy. In western and central Europe, it is estimated that 720 000 persons were living with HIV/AIDS at the end of 2005 and that over 20 000 individuals are becoming infected each year[1]. In eastern Europe and central Asia, 1.5 million persons were estimated to be living with HIV/AIDS at the end of 2005 and more than 200 000 persons to have been infected during 2005.

HIV is a retrovirus, which attacks the immune system and causes a lifelong severe illness with a long incubation period. There are two known types of HIV: HIV-1 and HIV-2. Both HIV-1 and HIV-2 have the same modes of transmission and are associated with similar illnesses. However, HIV-2 is less virulent and produces a milder illness. HIV-1 is more infectious, results in a more severe illness, and is responsible for the most HIV infections.

Infection with HIV occurs by the transfer of infected blood, semen, vaginal fluid and breast milk. HIV is spread by sexual contact with an infected person, by sharing needles or syringes (primarily for drug injection) with someone who is infected, or, less commonly (and now very rarely in countries where blood is screened for HIV antibodies), through transfusions of infected blood or blood clotting factors. Babies born to HIV-infected women may become infected before or during birth or through breast-feeding.

Infection with HIV-1 is associated with a progressive decrease of the CD4 T lymphocytes and an increase in viral load. The end-stage of the infection, acquired immunodeficiency syndrome (AIDS), results from the destruction of the immune system. AIDS is defined by the presence of one or more opportunistic illnesses (European AIDS case definition)[2].

Effective antiretroviral combination therapies, introduced in the mid-1990s and widely used in industrialised countries, have had a profound effect on the course of HIV infection, improving the quality of life and delaying the onset of AIDS and death in HIV-infected individuals. However, intolerance to side effects and appearance of resistant strains remain causes for concern.

AIDS surveillance is therefore no longer relevant in the assessment of the spread and burden of HIV and is of historical interest only. HIV reporting has become one of the key instruments for monitoring this epidemic in Europe.

10-year trends

HIV trends

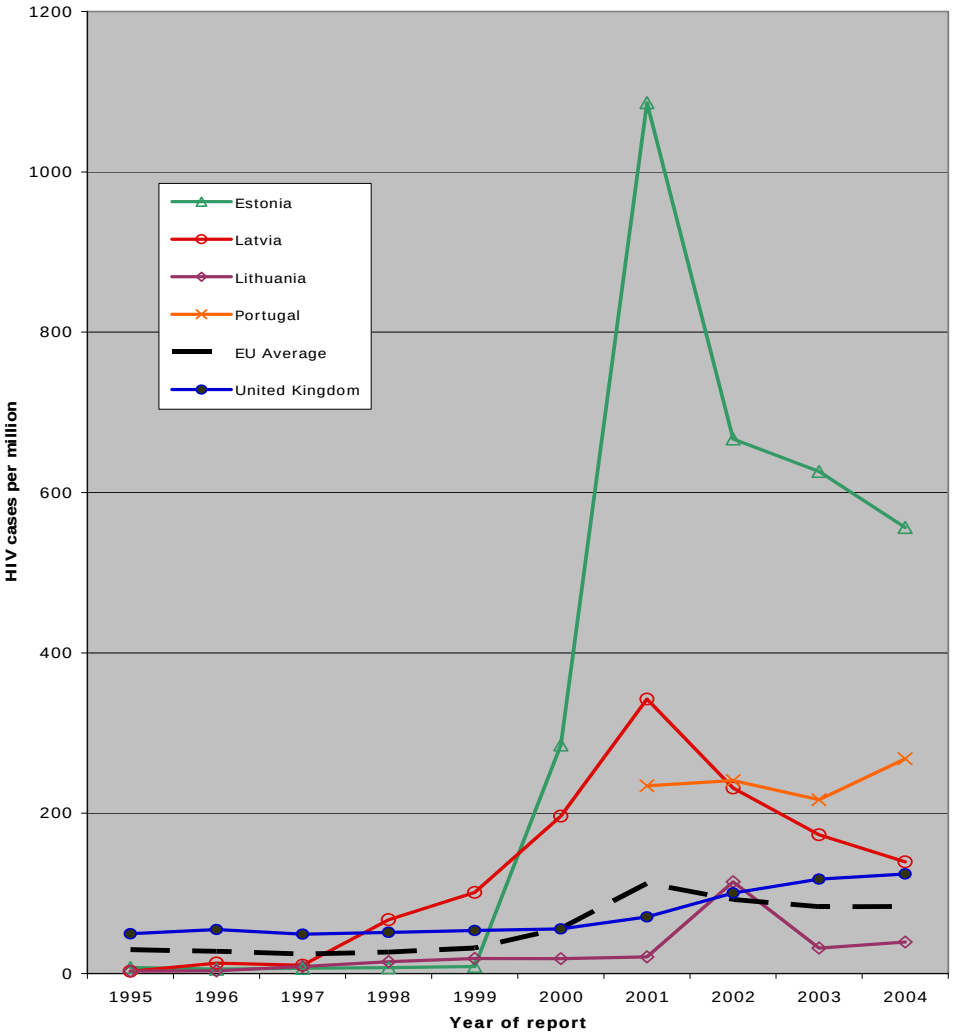
Surveillance data on HIV/AIDS are collected by the EuroHIV surveillance network in the 53 countries of the WHO European Region, including the data from the EU and EEA/EFTA countries. National data on HIV diagnoses are available from 23 of the 25 EU countries and from the EEA/EFTA countries for at least one year during the 1995–2004 period (figure 4.1.1). HIV surveillance was established at different times in the different countries. For instance, it had been set up in a majority of countries by the late 1980s, but not until much later in some (e.g. post-2000 in France, Malta and the Netherlands), and there is currently no national HIV reporting in Italy and Spain[3].

The epidemic exhibits very different patterns in the different EU Member States in terms of magnitude, trends, and affected populations. In the EU15, the epidemic is older and mature, with the highest rates found in Portugal. Among the other most affected countries, as explained above, HIV data are not available in Italy and Spain, and have only recently become available in France. Where data are available, the number of new HIV diagnoses appears to have shown signs of resurgence in recent years in a number of countries, with a particularly marked increase seen in the UK and in the Netherlands.

The epidemic in the new Member States is similarly diverse. In the Baltic States, the number of HIV diagnoses, which had been extremely low until the late 1990s, started to rise abruptly, peaking in 2001 or 2002, and then declined. Estonia has by far the highest rate, but in several other new

Member States, the number of new HIV diagnoses is still increasing but the rise is slow and the epidemic remains a low-level one. Not so the trend in the UK and Portugal, where the crude incidence rates are causing some concern (figure 4.1.1.).

Figure 4.1.1. Rate of HIV cases per million population in EU and EEA/EFTA countries by year reported, 1995–2004



Source: EuroHIV.

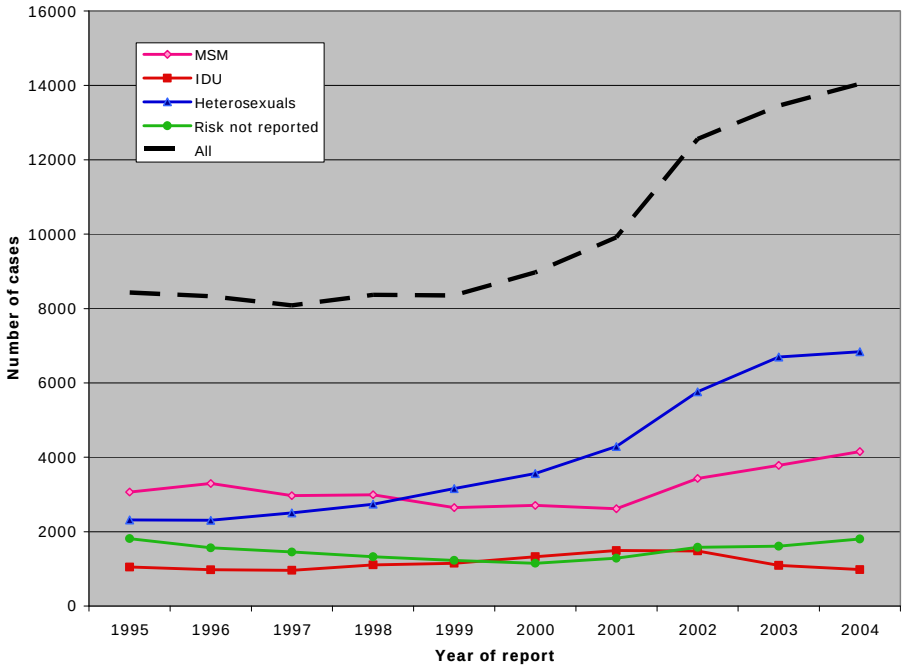
Data from Italy and Spain not available.

Consistent HIV reporting data are available from 20 countries (data by transmission group from 19 countries) from 1995 onwards. The number of new HIV diagnoses has been increasing sharply in recent years: from 8 366 in 1999 to 14 789 in 2004. Although the highest crude rates are found in Estonia, the overall EU figure is heavily influenced by the larger countries, more recently by the UK which accounts for almost half of the cases reported each year.

As shown in figure 4.1.2, much of the overall rise in the number of new HIV diagnoses in the EU is due to a steady increase of HIV infections diagnosed in persons believed to have been infected through heterosexual contact: from 2 314 cases in 1996 to 6 386 in 2004. This increase is largely due to the rising number of diagnoses in persons originating from high-prevalence countries outside Europe. The HIV diagnoses in men having sex with men (MSM) declined until around the year 2000, then started to rise again, from 2 615 cases in 2001 to 4 151 in 2004. The number of newly diagnosed

cases of HIV among injecting drug users accounts for a low proportion of total cases and has declined since 2001 (from 1 491 to 860 cases in 2004), although data are unavailable for Estonia, Italy, Spain and Portugal, where severe epidemics among injecting drug users have been reported in the past.

Figure 4.1.2. HIV reported cases by transmission group in EU and EEA/EFTA countries, by year reported,1995–2004



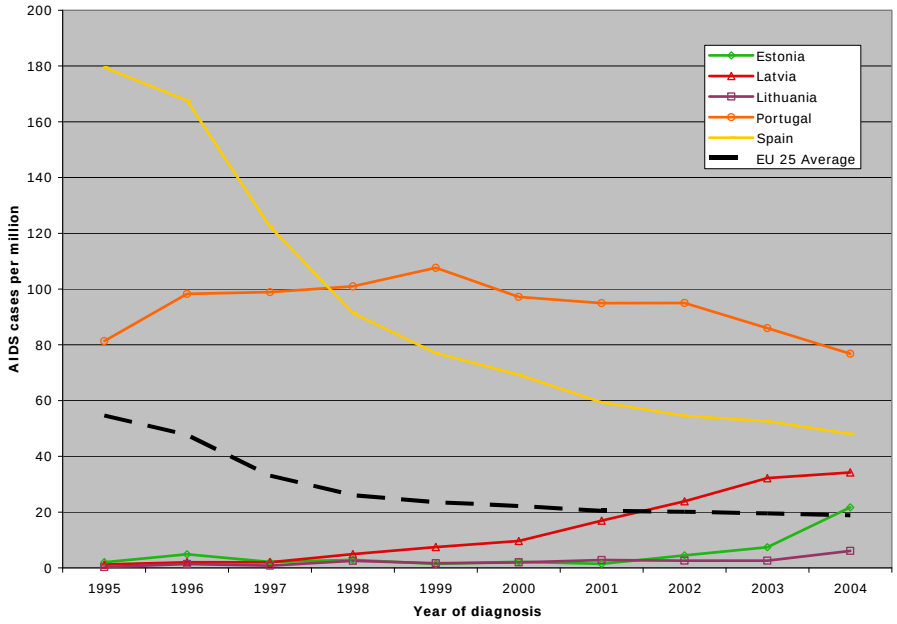
Source: EuroHIV. MSM = men having sex with men; IDU = injecting drug users.

Data on risk group was available from 20 countries: Belgium, Czech Republic, Cyprus, Denmark, Estonia (total only, no data by transmission group), Finland, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Norway, Poland, Slovakia, Slovenia, Sweden, Switzerland, United Kingdom.

AIDS trends

In contrast to HIV diagnoses, AIDS incidence has been declining since 1995, when it peaked in Europe. Similar trends are observed in most EU countries. Exceptions are Portugal and the Baltic States, where the HIV epidemic is much more recent and access to antiretroviral treatment is likely to be more limited than in other countries. The rates of AIDS cases can therefore be expected to continue to rise for the medium term, against the general trends in Europe.

Figure 4.1.3. Rate of AIDS incidence per million population in EU and EEA/EFTA countries, by year reported,1995–2004



Source: EuroHIV.

Data adjusted for reporting delays, EU25, Iceland and Norway included.

Mortality

In the period 1994–96, AIDS was the third cause of death among persons aged 25–44 years. However, AIDS mortality has decreased since 1996 as a result of the advances in treatment[4].

The situation in 2005

In 2005, 28 044 HIV diagnoses were reported by 26 countries (incidence rate of 66.3 per million). Data by transmission group are not available from Estonia (where many of the cases were believed to be in IDU), except for mother-to-child cases, nor for Italy, while for Austria only estimates are available. Trends described above have generally continued throughout 2005, i.e. a rise in diagnoses in MSM and persons infected through heterosexual contact.

Mode of transmission

Heterosexual contact accounts for the largest proportion of HIV infections diagnosed overall (43%). This is the case for most individual countries, but, reflecting the diversity of the epidemic across Europe, MSM is the largest transmission group in several Member States (Czech Republic, Denmark, Germany, Greece, Hungary, the Netherlands, Slovenia), and IDU the largest group in Latvia, Lithuania and Poland (no data by transmission available from Estonia). With 171 cases reported in 2005, mother-to-child transmission accounts for less than 1% of all new HIV diagnoses.

Table 4.1.1. Number of HIV cases by transmission group in EU25 and EEA/EFTA countries, 2005

	MSM		IDU		HC		Other		Risk not reported		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	N	Rate per million
Austria([a])	111	(24.0)	85	(19)	199	(44)	58	(13)	0	(0.0)	453	55.3
Belgium	231	(21.7)	12	(1.1)	404	(37.9)	34	(3.2)	385	(36.1)	1066	102.3
Cyprus	17	(39.5)	0	(0.0)	25	(58.1)	1	(2.3)	0	(0.0)	43	51.5
Czech Republic	50	(55.6)	4	(4.4)	28	(31.1)	0	(0.0)	8	(8.9)	90	8.8
Denmark	127	(44.6)	19	(6.7)	118	(41.4)	7	(2.5)	14	(4.9)	285	52.5
Estonia([b])	—		—		—		4	(0.6)	617	(99.4)	621	467.0
Finland	31	(22.6)	15	(10.9)	63	(46.0)	0	(0.0)	28	(20.4)	137	26.1
France	1317	(21.4)	163	(2.6)	2652	(43.1)	53	(0.9)	1966	(32.0)	6151	99.0
Germany	1220	(49.8)	136	(5.5)	681	(27.8)	17	(0.7)	397	(16.2)	2451	29.6
Greece	175	(31.3)	19	(3.4)	148	(26.4)	2	(0.4)	216	(38.6)	560	50.4
Hungary	55	(51.9)	2	(1.9)	20	(18.9)	5	(4.7)	24	(22.6)	106	10.5
Ireland	57	(17.9)	66	(20.8)	159	(50.0)	8	(2.5)	28	(8.8)	318	76.7
Italy([c])	—		—		—		—		1 215	(100)	1 215	20.8
Latvia	15	(5.0)	111	(37.1)	94	(31.4)	2	(0.7)	77	(25.8)	299	129.6
Lithuania	3	(2.5)	85	(70.8)	20	(16.7)	0	(0.0)	12	(10.0)	120	35.0
Luxembourg	13	(20.6)	7	(11.1)	39	(61.9)	0	(0.0)	4	(6.3)	63	135.5
Malta	5	(26.3)	0	(0.0)	11	(57.9)	1	(5.3)	2	(10.5)	19	47.3
Netherlands	571	(47.0)	29	(2.4)	448	(36.8)	23	(1.9)	145	(11.9)	1216	74.6
Poland	39	(6.0)	151	(23.2)	70	(10.7)	9	(1.4)	383	(58.7)	652	16.9
Portugal	294	(11.2)	857	(32.5)	1409	(53.5)	18	(0.7)	57	(2.2)	2635	251.1
Slovakia	9	(42.9)	0	(0.0)	12	(57.1)	0	(0.0)	0	(0.0)	21	3.9
Slovenia	29	(80.6)	0	(0.0)	4	(11.1)	0	(0.0)	3	(8.3)	36	18.3
Sweden	97	(24.7)	25	(6.4)	194	(49.5)	12	(3.1)	64	(16.3)	392	43.4
United Kingdom	2696	(30.4)	168	(1.9)	4750	(53.6)	93	(1.0)	1161	(13.1)	8868	148.3
Iceland	3	(37.5)	0	(0.0)	5	(62.5)	0	(0.0)	0	(0.0)	8	27.2

Norway	56	(25.6)	20	(9.1)	134	(61.2)	6	(2.7)	3	(1.4)	219	47.4
Total	7221	(25.7)	1974	(7.0)	11 687	(42.8)	353	(1.3)	6809	(24.3)	28 044	66.3

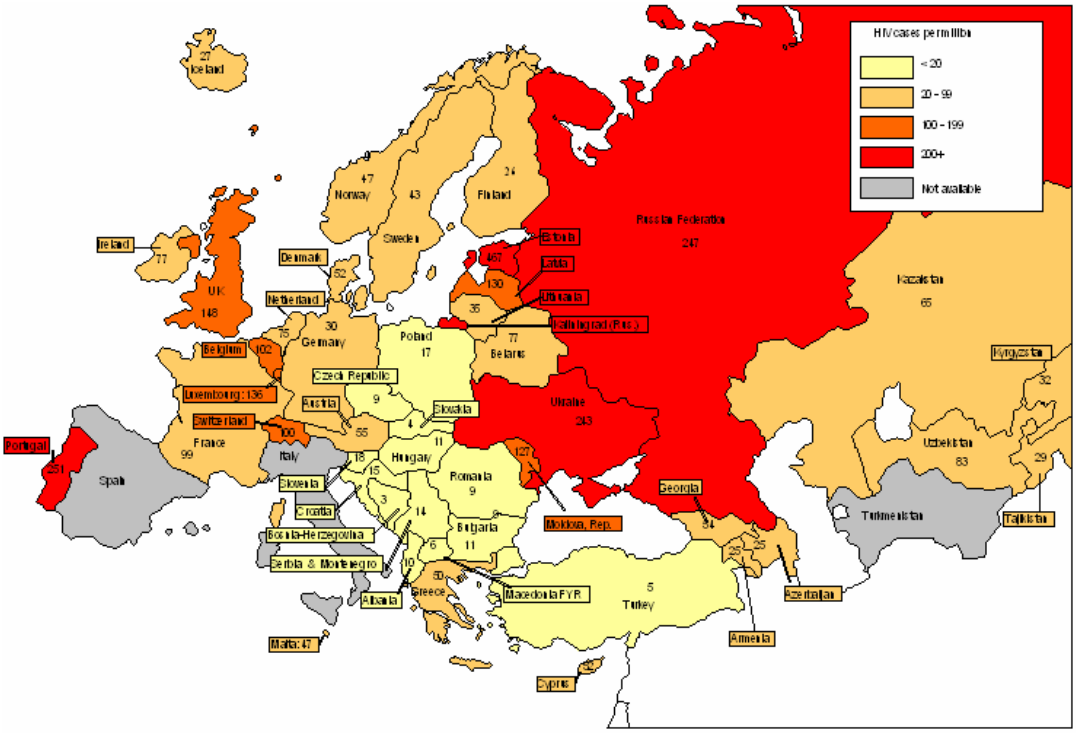
Source: EuroHIV. MSM = men having sex with men; IDU = injecting drug users; HC = heterosexual contact; Other = cases of mother-to-child transmission and cases infected through the transfusion of blood or blood product.

(a) Austria: data on transmission group estimated from cohort study.

(b) Estonia: data not available by transmission group except for mother-to-child cases.

(c) Italy: data from national register not from report to EuroHIV.

Figure 4.1.4. Rate of HIV cases per million population in the WHO European Region, 2005

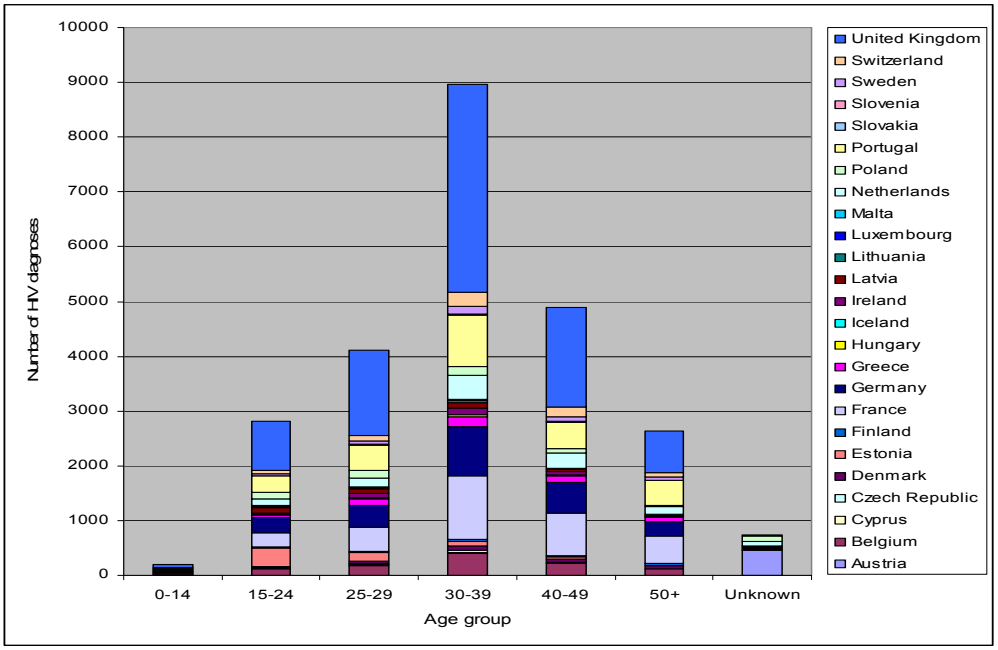


Source: EuroHIV.

Age and gender distribution

Overall, nearly two-thirds (63%) of diagnoses were in men. The highest number of HIV diagnoses was reported in the age group 30–39 years, representing 43% of all cases. Young people aged 15–24 years accounted for 10% of the diagnoses and people aged over 50 years, 8%. Children under 15 years old accounted for less than 1% of all diagnoses. Age and gender distribution do vary, however, across the region. For example, young people aged 15–24 years accounted for 55% of the cases in Estonia and for 30% in Latvia.

Figure 4.1.5. Number of HIV cases by age group and reporting country in the EU and EEA/EFTA countries, 2005

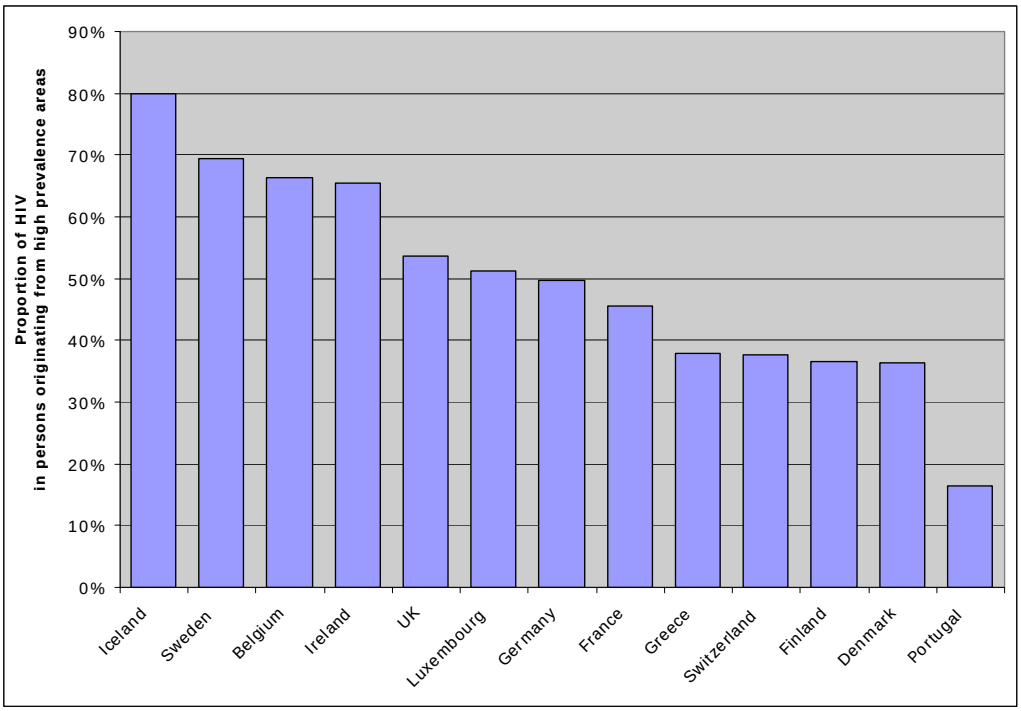


Source: EuroHIV.

Imported cases

EuroHIV collects information on the country of origin of the cases, rather than on the place of infection. Overall, nearly half (47%) of the newly diagnosed cases of HIV infection acquired by heterosexual contact were among persons originating from countries with more generalised epidemics, ranging from 17% in Portugal to 80% in Iceland. Data from several countries suggest that the majority of these persons are believed to have been infected in their country of origin, although transmission within the host EU country does occur[5].

Figure 4.1.6. Proportion of heterosexually-acquired HIV infection in persons originating from countries with generalised epidemics reported in 11 EU and 2 EEA/EFTA countries, 2005



Source: EuroHIV.

Conclusions

HIV in Europe is not a single epidemic but should be seen as a multitude of diverse epidemics. Common trends are nevertheless emerging.

- Heterosexual contact accounts for the largest number of HIV infections being diagnosed in most countries, but probably not for the largest number of transmissions occurring within these countries. The trends underlying the rapid and substantial increases in HIV diagnoses among men and women having heterosexual sex in the EU are complex and sometimes misinterpreted. Even though the number of heterosexually infected men and women diagnosed in the EU is rising steadily, this is to a large extent due to an increase of HIV diagnoses among persons originating from, and infected in, countries outside the EU, primarily in sub-Saharan Africa[5].

- Because of the relative size of the different populations at risk, MSM remains the group at highest risk in most countries. The continued increase in HIV diagnoses is due to a persistently high rate of newly acquired infections in MSM.

- In the Baltic States, the HIV epidemic is driven by IDU. There, the recent decline in the number of cases among IDU most likely reflects a saturation of the IDU population, whereby those at highest risk have already been infected. In parallel, the number of cases of heterosexual transmission is increasing, probably reflecting the spread to the sex partners of IDU, and perhaps to the broader general population.

- Data presented here concern cases of HIV infection that have been diagnosed and reported. A large proportion of HIV-infected persons have not been diagnosed. Estimates of the undiagnosed fraction of the HIV-infected population vary across countries, ranging from 15% in Sweden to 32% in the UK[6] and 60% in Poland (estimate based on informal communications with national HIV/AIDS correspondents).

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National coverage
						Labs	Physicians	Hospitals	Others	
Austria	AIDS-Gesetz 1993	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	HIV/AIDS register	V	Co	A	C-B	Y	Y	Y	N	Y
Cyprus	HIV/AIDS	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	Report of HIV/AIDS	C	Co	A	C-B	Y	Y	Y	Y	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	obligatory, countrywide AIDS	C	Co	P	C-B	Y	N	Y	N	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
Finland	STD sentinel surveillance	V	Se	P	C-B	N	Y	N	N	N
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
Germany										
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y

Hungary	HIV/AIDS surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	HIV/AIDS SURVEILLANCE	V	Co	P	C-B	Y	Y	Y	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	HIV/AIDS surveillance system	V	Co	P	C-B	Y	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg		V	Co	P	C-B	Y	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	HIV/AIDS registry	V	Se	P	C-B	N	Y	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	HIV infection and AIDS Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	HIVSUR	C	Co	P	C-B	N	Y	N	N	Y
Spain	AIDS Register	C	Co	P	C-B	N	Y	N	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Aids	V	Co	A	C-B	Y	N	Y	Y	N

4.2 Antimicrobial resistance

Background on the emergence of antimicrobial resistance (AMR)

Since their discovery, antibiotics have revolutionised the way we treat patients with bacterial infections and have contributed to reducing the mortality and morbidity from bacterial diseases. They are also an essential tool for modern medicine and common procedures such as transplants, chemotherapy for cancer and even orthopaedic surgery could not be performed without the availability of potent antibiotics.

Unfortunately antibiotics have also been liable to misuse. Antibiotics are often unnecessarily prescribed for viral infections. Similarly when diagnoses are not accurately made, more often than not, broad-spectrum antibiotics, i.e. antibiotics that kill a large proportion of various bacteria and not only the bacteria responsible for the disease, are prescribed because the micro-organism responsible for the infection is not known. These examples of misuse promote the emergence and the selection of resistant bacteria.

Considering the mechanisms behind the emergence of AMR, the strategy for its containment in humans is rather straightforward:

- use less antibiotics, i.e. only when they are needed to treat patients;
- block the spread of resistant strains between persons.

The Health Council has provided recommendations[1] to Member States to establish national strategies to contain AMR. The Commission followed up on progress in the Member States and presented their findings to the Council at the end of 2005[2].

AMR trends in the European Union

Specific data to follow AMR trends in the EU have been collected by the European Antimicrobial Resistance Surveillance System (EARSS)[3], established in 1999 and funded by the Commission's Directorate-General for Health and Consumer Affairs (DG Sanco) and the Dutch Ministry of Health, Welfare and Sport. EARSS started by collecting antimicrobial susceptibility data on two bacterial species, later extended to the present seven bacterial species.

EARSS data must be interpreted with caution. The laboratories participate on a voluntary basis and are not necessarily representative of each country. In some countries only a few laboratories participate. There may be large regional differences in the prevalence of AMR within countries, but only national-level data are reported by EARSS. Only isolates from blood and spinal fluid samples are surveyed by EARSS, which means that they mostly represent infections in hospital patients. The methodology to perform susceptibility testing is expected to be standardised in participating laboratories, but so far this can still vary.

Despite these drawbacks EARSS provides a good overview of AMR in Europe. The data are collected by more than 900 laboratories serving around 1 400 hospitals in 32 countries. Two new countries, Lithuania and Turkey, joined EARSS at the end of 2005. Overall, EARSS participating laboratories provide services to an estimated population of over 100 million citizens in Europe.

Resistance data are shown below for four bacteria comparing 2001 and 2005 (figures 4.2.1–4.2.4). There is a general gradient from low resistance in northern Europe (Scandinavia and the Netherlands) to high resistance in southern and south-eastern Europe.

A general increase in methicillin-resistant *Staphylococcus aureus* (MRSA) is occurring throughout Europe and includes countries with high, medium, as well as low baseline endemicity. However, two countries, Slovenia and France, succeeded in significantly reducing the proportion of MRSA among *S. aureus* bloodstream infections (figure 4.2.5), demonstrating that this MRSA pandemic is not irreversible.

Glycopeptide-resistant enterococci are increasing, not surprisingly in countries reporting high MRSA. Glycopeptides are used for the treatment of MRSA-infected patients. This is frequently combined with frequent patient-to-patient transmission in health care settings.

Klebsiella pneumoniae and *Pseudomonas aeruginosa* are recent additions to the EARSS database, but patterns are already emerging. As for other gram-negative bacteria there is a geographical gradient from low resistance in north-western Europe to high resistance in south-eastern Europe. *Klebsiella pneumoniae* invasive isolates resistant to third-generation cephalosporins, fluoroquinolones and aminoglycosides are common in eastern and south-eastern Europe and many of the isolates show combined resistance to these antibiotics. Combined resistance is also the most important threat imposed by invasive *Pseudomonas aeruginosa*.

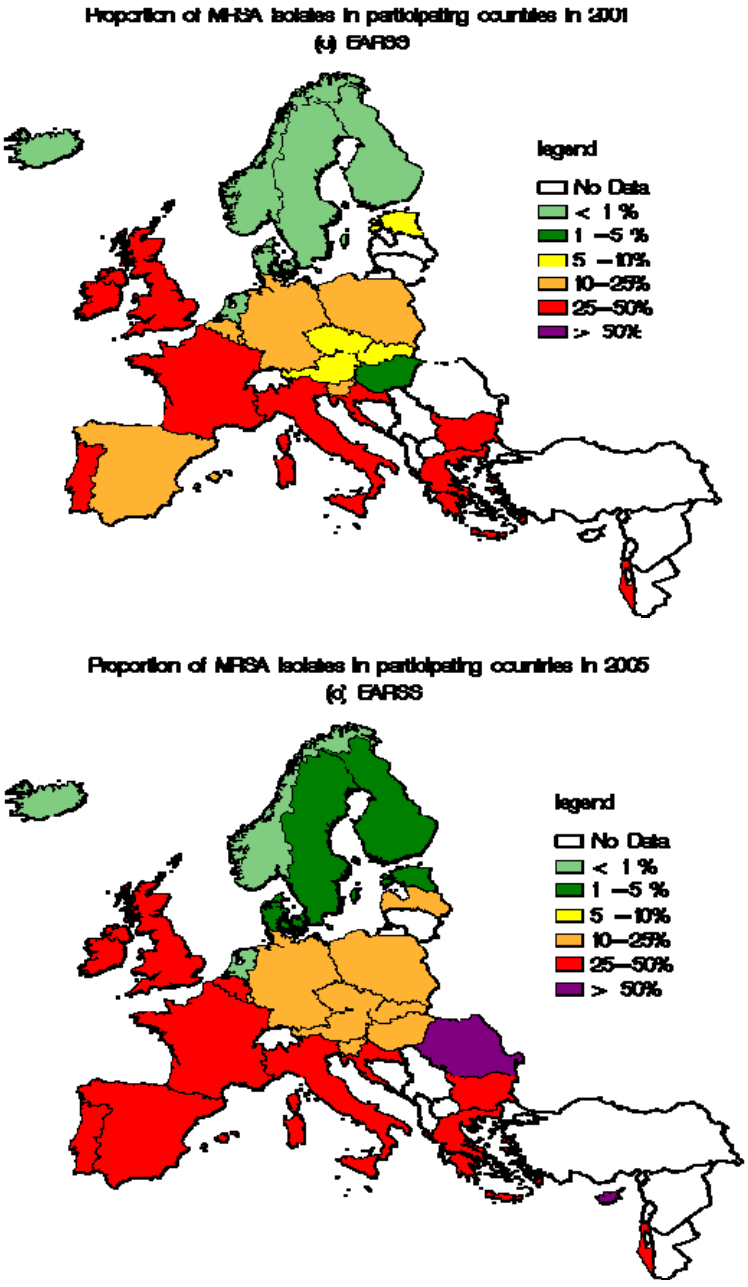
While MRSA, glycopeptides-resistant enterococci and resistant *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* are mostly markers of resistance problems in health care settings, resistance in *Streptococcus pneumoniae* and *Escherichia coli* mainly reflects the situation outside hospitals.

The proportion of *Streptococcus pneumoniae* resistant to antibiotics keeps changing, with decreasing penicillin resistance in some highly endemic countries and with continuous increase in penicillin and/or macrolide resistance in other European countries. The main resistance phenotypes in pneumococci are confined to a few serogroups, all of which are included in the currently promoted conjugate vaccine. This suggests that vaccination, especially in young children, would probably represent an effective additional means of controlling antibiotic-resistant *Streptococcus pneumoniae* in Europe.

Fluoroquinolone resistance in invasive *Escherichia coli* is increasingly rapidly and in most European countries. Co-resistance, combining resistance to three antibiotic classes including third-generation cephalosporins is already the fourth most common resistance pattern found in invasive *Escherichia coli* in Europe.

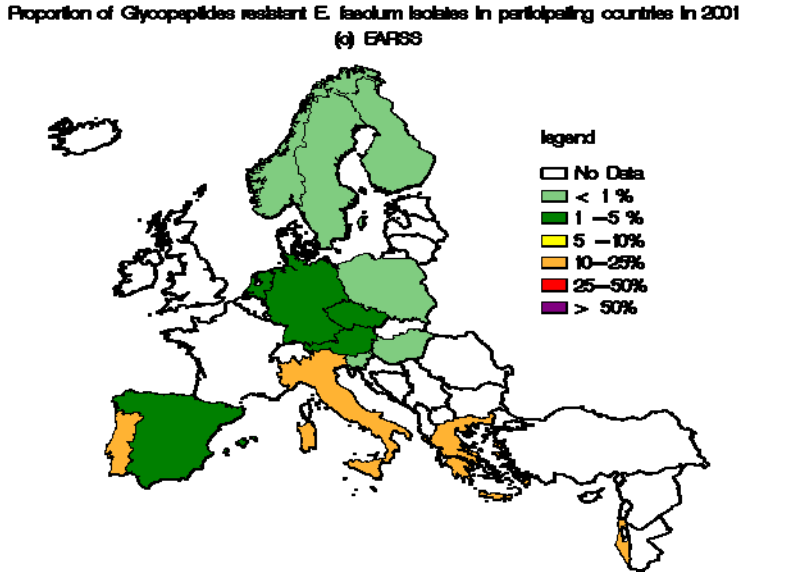
In *Streptococcus pneumoniae* and *Escherichia coli*, AMR is common for those antibiotics that are available for oral administration, e.g. aminopenicillins, macrolides and fluoroquinolones, and therefore commonly used to treat infections in ambulatory care. In this context, the growing availability of third-line antibiotics as oral formulations is a matter of concern and underscores the need for national as well as local antibiotic policies for ambulatory care and for hospitals.

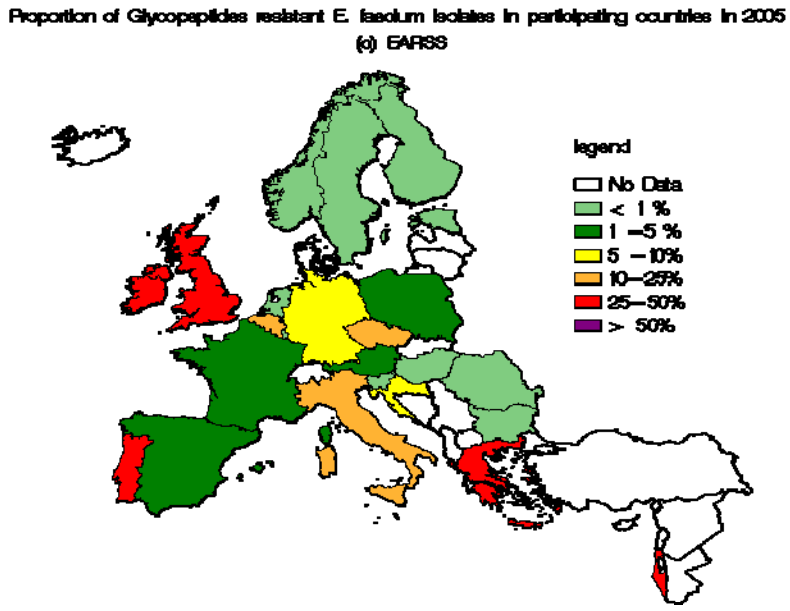
Figure 4.2.1. *Staphylococcus aureus*: proportion of invasive isolates resistant to methicillin (MRSA) in 30 countries in the European region, 2001 and 2005



Source: EARSS.

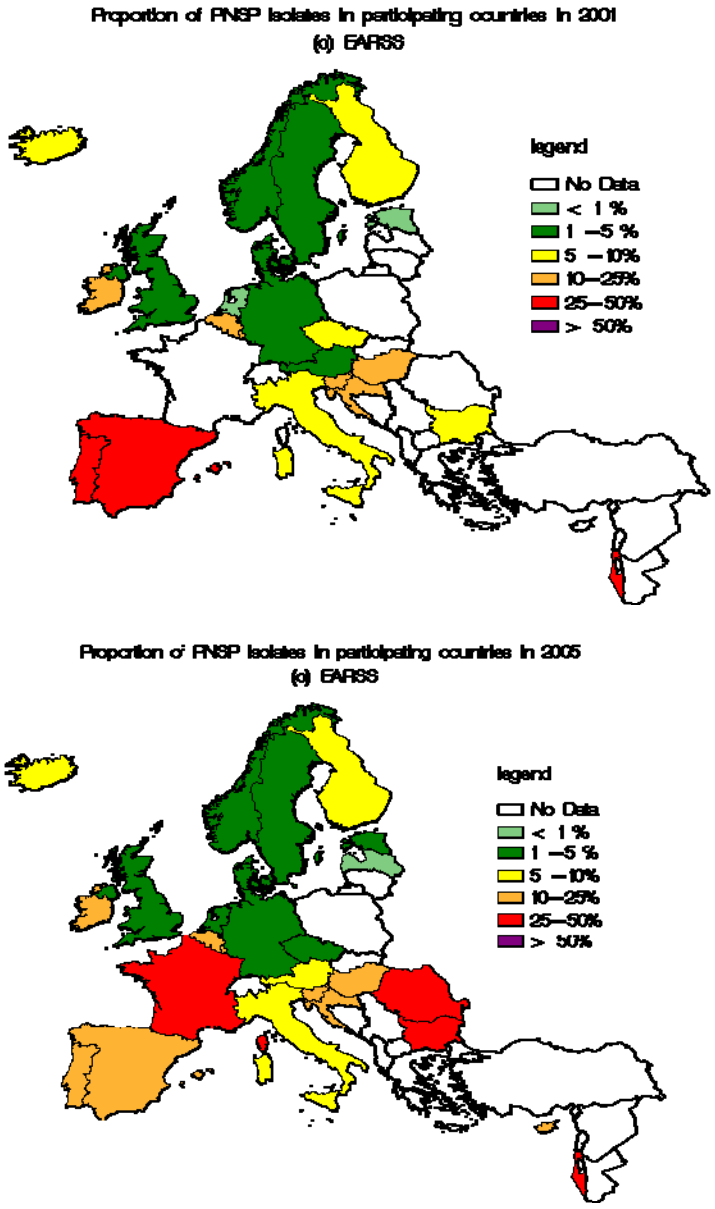
Figure 4.2.2. *Enterococcus faecium*: proportion of invasive isolates resistant to glycopeptides, e.g. vancomycin, in 28 European countries of the European region, 2001 and 2005





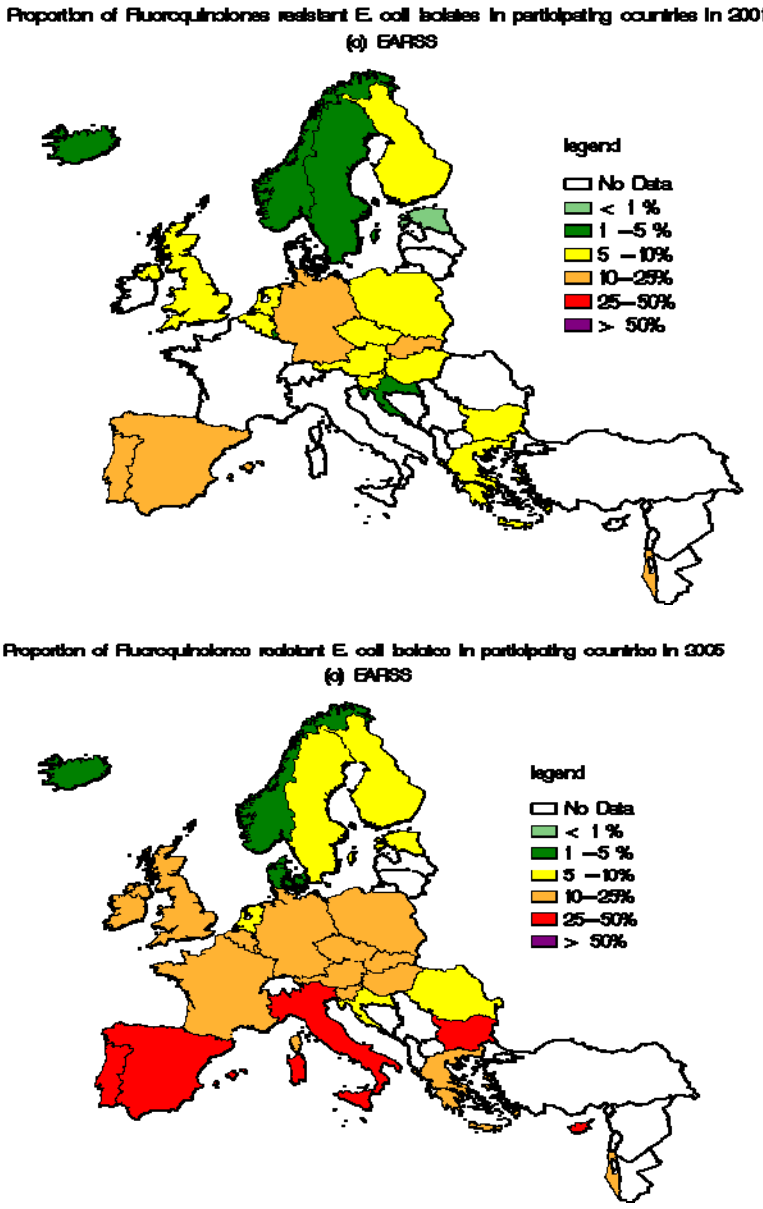
Source: EARSS.

Figure 4.2.3. *Streptococcus pneumoniae*: proportion of invasive isolates non-susceptible, i.e. resistant or intermediate, to penicillin (PNSP) in 29 countries in the European region, 2001 and 2005



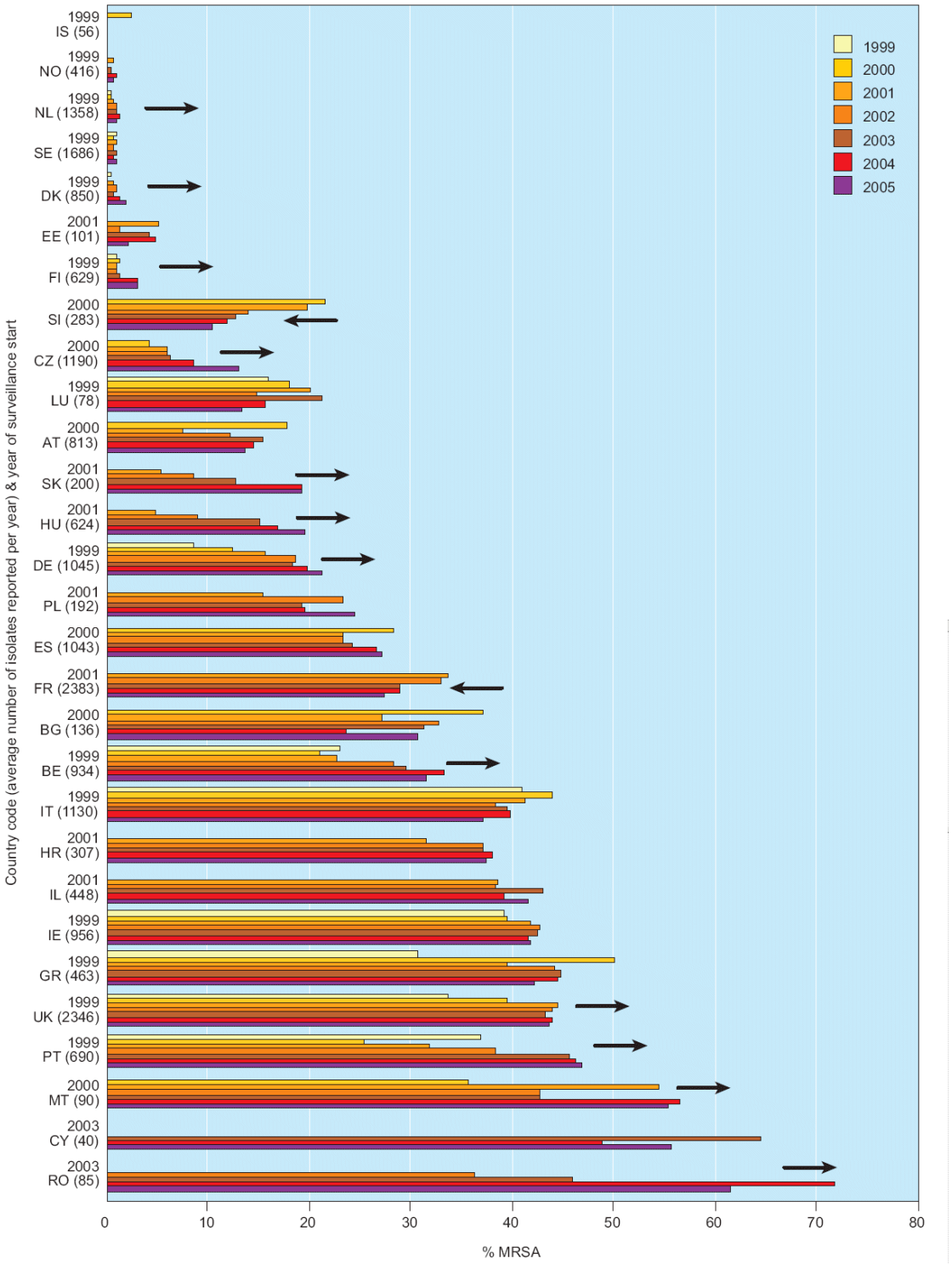
Source: EARSS.

Figure 4.2.4. *Escherichia coli*: proportion of invasive isolates resistant to fluoroquinolones in 29 countries in the European region, 2001 and 2005



Source: EARSS.

Figure 4.2.5. Trends in the proportion of methicillin-resistant *Staphylococcus aureus* (MRSA) from blood and spinal fluid in 29 European countries, 1999–2005



Source: EARSS Annual Report 2005. Only the countries that reported 20 isolates or more each year for at least three years were included. The arrows indicate significant trends.

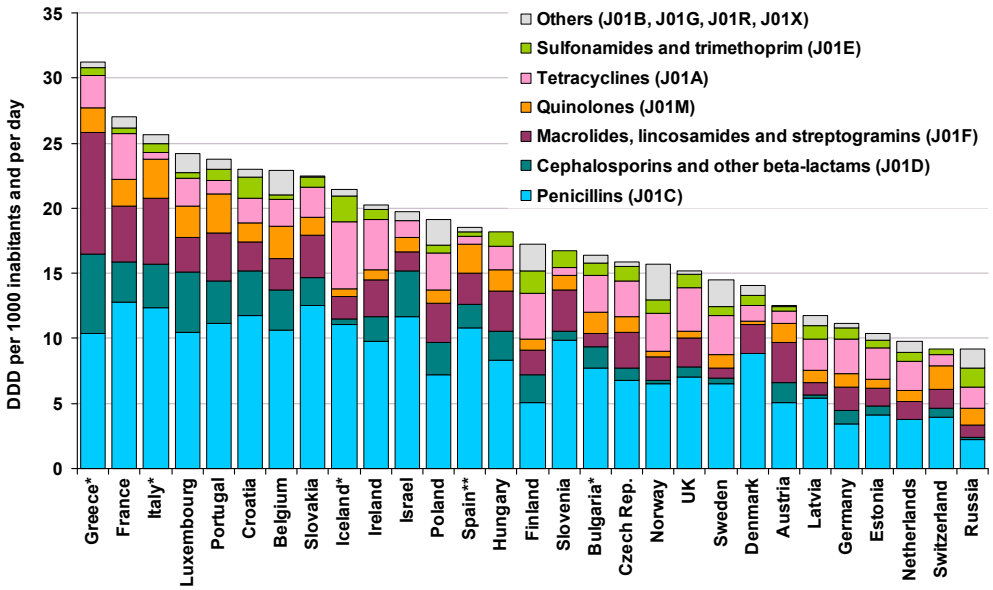
Trends in antimicrobial usage in the EU

Trends in antimicrobial usage in the EU have been analysed by the European Surveillance of Antimicrobial Consumption (ESAC)[4]. The coverage of ESAC has increased over the years and 34 countries currently participate in this surveillance network.

As for AMR, there is a general gradient from low antimicrobial use in northern Europe to higher use in southern Europe, the highest user using three times more antibiotics than the lowest. Additionally, there are marked differences in the type of antibiotics that are used. In Nordic European countries a large proportion of total use is still represented by older, narrow-spectrum antibiotics and newer, broad-spectrum classes are seldom used for outpatients (figure 4.2.6). This is the most likely reason for the low levels of resistance to these newer antibiotic classes in Nordic countries. A consistent association between the level of use of specific antibiotic classes and resistance to these classes has been reported by ESAC, thus confirming the suspected relationship between antibiotic use and AMR in European countries[5].

Some countries have shown a marked increase in their outpatient use of antibiotics between 2002 and 2004 (Croatia: +1.3 DDD per 1 000 inhabitants and per day, Ireland: +1.2, Hungary: +1.1). Italy and Greece reported increases of +1.3 and +0.7 DDD per 1 000 inhabitants and per day, respectively, between 2002 and 2003. Conversely, some other countries have shown a marked decrease (France: -5.0 DDD per 1 000 inhabitants and per day, Slovakia: -3.1, Germany: -2.7, Portugal: -2.3, Luxembourg: -2.3). The decrease in France has been attributed to a national antibiotic plan, including a national public campaign, which has been run annually since 2001, and individual feed-back to prescribers on their antibiotic prescribing pattern. The remaining countries have only shown smaller variations (+/- 1 DDD per 1 000 inhabitants and per day) during this same period.

Figure 4.2.6. Total outpatient antibiotic use in 29 European countries in 2004



Source: ESAC. *Total use for Iceland and Bulgaria, 2003 data for Greece and Italy. **Reimbursement data, which do not include over-the-counter sales without a prescription.

Harmonising susceptibility testing in Europe

A prerequisite to be able to properly follow the trends of AMR patterns is that the methodology for susceptibility testing is the same in all laboratories. The methods must also be reliable and quality assured. ESCMID (European Society of Clinical Microbiology and Infectious Diseases) set up a group that was working on standardisation in this field. The Commission has supported this work as

a network since 2004 in the European Committee on Antimicrobial Susceptibility Testing (EUCAST)[6]. EUCAST has accomplished a number of important achievements:

- Agreement on a model for setting harmonised breakpoints for new antimicrobial agents in Europe. EMEA, the pharmaceutical industry and EUCAST have agreed (2005) on a standard operating procedure giving EUCAST a formal role in the registration process for new antimicrobial agents.

- Agreement on a model for harmonising breakpoints for existing antimicrobial agents in Europe.

- Web-based software for the collection and presentation of wild type MIC distributions of relevant drug/organism combinations. The programme is accessible through a link from the EUCAST website.

- Agreement to define epidemiological (microbiological) cut-off values for the detection of any phenotypic antimicrobial resistance in surveillance programmes.

Monitored threats in 2005

During the last two years a new antimicrobial-resistant micro-organism has emerged. *Clostridium difficile* is a bacterium that can be found in the intestine of humans. Under certain circumstances it is responsible for severe diarrhoea that can lead to death. The most common risk factor for *Clostridium difficile* infection is antibiotic exposure. A specific strain, strain 027, gives a more serious disease, which results in a higher mortality than with other strains. It is also resistant to a class of antibiotics, the quinolones, which are commonly used in hospitals. The strain first appeared in Canada and in the United States, but has now spread extensively in England and to a lesser degree in Belgium, the Netherlands and France.

A working group with participants from ECDC, some Member States and the ESCMID Study Group on *Clostridium difficile* has published a background document with a suggested plan of action as well as a suggested case definition[7].

Conclusion

- AMR is a major problem in European health care. It affects patient care, jeopardises optimal therapy and makes guidelines obsolete unless constantly rewritten. Although additional studies are needed to determine the precise size of the burden of AMR for the EU, there is no doubt that AMR prolongs patient suffering, costs money and is actually responsible for the death of thousands of European citizens each year.

- In the light of practically no *new* class of antibiotics on the European market, at least for the near future, the only option to curb resistance is to follow the strategies outlined in the Council recommendations. This will require a strong commitment from government and health care personnel in each member state as well as raising awareness with the general public about AMR and the prudent use of antibiotics.

- Combating AMR requires several concerted actions. There are indications that, when efficiently implemented, these actions may stop the AMR resistance and can even result in decreasing AMR rates. Several European countries have, or are in the process of, implementing interventions aimed at curbing AMR, often by combining more rational prescribing of antibiotics with an enforcement of infection control measures. These interventions will be followed closely by European surveillance networks and systems.

References

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EARSS	V	Se	A	C-B	Y	N	Y	N	Y
Belgium	National Surveillance of Hospital Infections (NSIH): AMR	V	Se	A	C-B	Y	Y	Y	N	Y
Cyprus	EARSS	V	Se	A	C-B	Y	N	N	N	N
Czech Republic	Euroepan Antimicrobial Resistance (EARS)	V	Se	P	A	Y	Y	N	N	Y
Denmark	DANMAP	V	Co	A	A	Y	N	N	Y	Y
Estonia										
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Onerba: Observatoire National de l'Etude de la Résistance aux Antibioitques	V	Co	P	A	Y	N	N	N	Y
France	Observatoires Régionaux du Pneumocoque (ORP)	V	Co	A	C-B	Y	N	N	N	Y
Germany										
Greece	Greek System for the Surveillance of Antimicrobial Resistance	V	Ot	A	C-B	Y	N	N	N	N
Hungary	antibiotic resistance	V	Se	P	C-B	Y	N	N	N	Y

	monitoring system									
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	EARSS	V	Co	P	C-B	Y	N	N	N	N
Italy	ARISS	V	Se	P	C-B	Y	N	N	N	N
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Liechtenstein										
Lithuania										
Luxembourg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	Antimicrobial resistance	V	Se	P	C-B	Y	N	N	N	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway	NORM	C	Co	A	A	Y	N	N	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia										
Slovenia										
Spain										
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Antimicrobial resistance	V	Co	A	C-B	Y	Y	Y	Y	Y

4.3 Anthrax

Anthrax is a zoonotic disease caused by the gram-positive, spore-producing bacterium *Bacillus anthracis*. Reservoirs are herbivores, and the spores can survive in the environment for decades. The disease is endemic in several regions of the world, including southern and eastern Europe.

Humans may acquire the infection after exposure to spores, and symptoms appear one to seven days (up to 60 days) later. Clinical presentations include cutaneous anthrax, pulmonary forms, (with a case fatality ratio of around 75%) and gastrointestinal forms (gastrointestinal symptoms may progress to septicaemia and death). Antibiotic treatment is effective if administrated at an early stage.

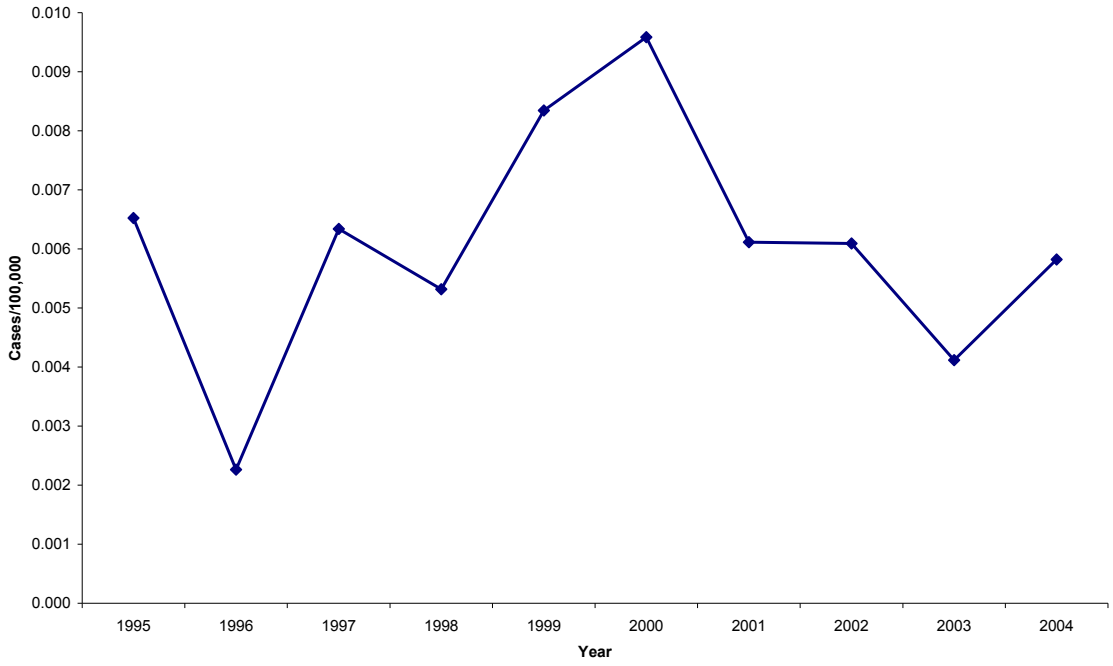
Control measures include the correct disposal of animal carcasses: disinfection, decontamination and disposal of contaminated materials and decontamination of the environment. Protective equipment must be used by workers. Vaccination of exposed animals and humans is required.

Anthrax-related bioterrorist threats have been investigated in Europe. The agent was not confirmed, but a preparedness and response programme for attacks by biological and chemical agents (BICHAT) was developed in 2002 by the European Commission and specific guidelines for the clinical management of bioterrorism-related anthrax were published in 2004.

10-year trends

Data from all 25 EU Member States plus Iceland and Norway are available for anthrax for the period 1995 to 2004, apart from France, Luxembourg, Malta and Spain which only reported for some of the period (Liechtenstein did not submit reports). The annual number of reported cases has remained more or less steady at around 25 cases per year (figure 4.3.1).

Figure 4.3.1. Incidence rate of human anthrax cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The cumulative number of reported cases for this period is 250, with 10 Member States reporting cases, but only six countries reporting more than five: United Kingdom (6), Poland (12), Italy (13),

Portugal (18), Greece (34) and Spain (162). Spain accounts for 65% of the cases and shows the highest incidence over the entire period.

The situation in 2005

In 2005, 21 countries provided data, but only four reported cases: Belgium (one case) Greece (one case) Poland (two cases) and Spain (six cases). The overall incidence rate was 0.003 per 100 000.

Conclusions

- Anthrax is a rare disease in the EU, with an overall decreasing trend over the past 10 years in the EU.
- Only 10 cases were reported in 2005, suggesting a declining trend, but the low number of reported cases does not enable a meaningful analysis of the trends in incidence.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference	V	Co	P	C-B	Y	N	N	N	Y

	Centres									
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Anthrax Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Anthrax	C	Co	A	C-B	Y	N	Y	Y	Y

4.4 Avian influenza

Influenza is an acute infectious disease of the respiratory tract caused by the influenza virus which occurs in three types: A, B and C. The most significant threat to humans arises from the influenza A viruses. The natural reservoir of influenza viruses is a diverse and constantly changing pool of viruses among aquatic wild bird populations, the avian influenza (AI) viruses. These are divided into those of high and low pathogenicity (hence HPAI and LPAI). Since 1959 twenty-four HPAI epizootics have been documented worldwide, all due to the A/H5 and A/H7 virus groups. Usually these viruses cause only minor illness in humans[1].

Since 1997 a new and more lethal strain of HPAI viruses (A/H5N1) has appeared in domestic poultry and humans, initially in southern China where the first human-to-human transmission took place. After 2003, A/H5N1 appeared in many Asian countries causing huge outbreaks in birds and a small number of severe human infections, almost entirely among people with close contacts with domestic poultry. There have been a few, but unsustained, person-to-person transmissions[2].

This A/H5N1 group has shown itself to be unusually stable for an avian influenza strain and has spread among birds in two waves, the second of which took it out of south and south-east Asia to Europe and Africa through migratory birds and trade. While there have been changes in its genetic make-up it remains a group of influenza viruses of birds. It is poorly adapted to humans who are difficult to infect except at high doses[2,3].

The danger to humans lies in the fact that the strain is highly pathogenic in those few humans that do become infected. However, there is generally no transmission from one human to another[3]. To date (January 2007) 269 human cases with 163 deaths (fatality rate >61%) have been reported to WHO.

Cases and trends

Though there have been significant numbers of cases of avian influenza in wild birds in Europe, and a few outbreaks in poultry were seen when a wave of infection in migratory birds swept through the EU from the east during the winter of 2005–06[4], no human cases of avian influenza A/H5N1 have yet been reported in Europe, so there can be no discussion of trends of disease at this stage.

Nevertheless, outbreaks with human cases on the borders of the EU are a reminder of an enduring risk. Within the EU the people considered to be most at risk are those with small domestic flocks[5]. There remains considerable concern over the pandemic risk from H5N1 and on this basis in 2004 WHO raised its pandemic risk to Phase 3. This concern results in part from the widely held view that the worst pandemic of the 20th century arose from another strain of avian influenza.

Conclusions

- Strict surveillance of any suspected avian influenza cases will need to be maintained over the coming years.

References

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Surveillance systems overview

Not studied.

4.5 Botulism

Botulism is a serious paralytic illness caused by a nerve toxin produced by the bacterium *Clostridium botulinum*. The disease may occur after eating foods containing the toxin (food-borne botulism) or due to anaerobic germination of the spores within the intestine or within wounds (intestinal/infant botulism and wound botulism, respectively).

Food-borne botulism is the only epidemiologically relevant form of the disease, and paralytic symptoms generally appear after an incubation period of 12–36 hours (up to several days) after the ingestion of the toxin-containing food. The clinical picture may be very severe, and require intensive-care treatment and the administration of an anti-toxin. Even where these are available, the case fatality ratio averages 5–10%.

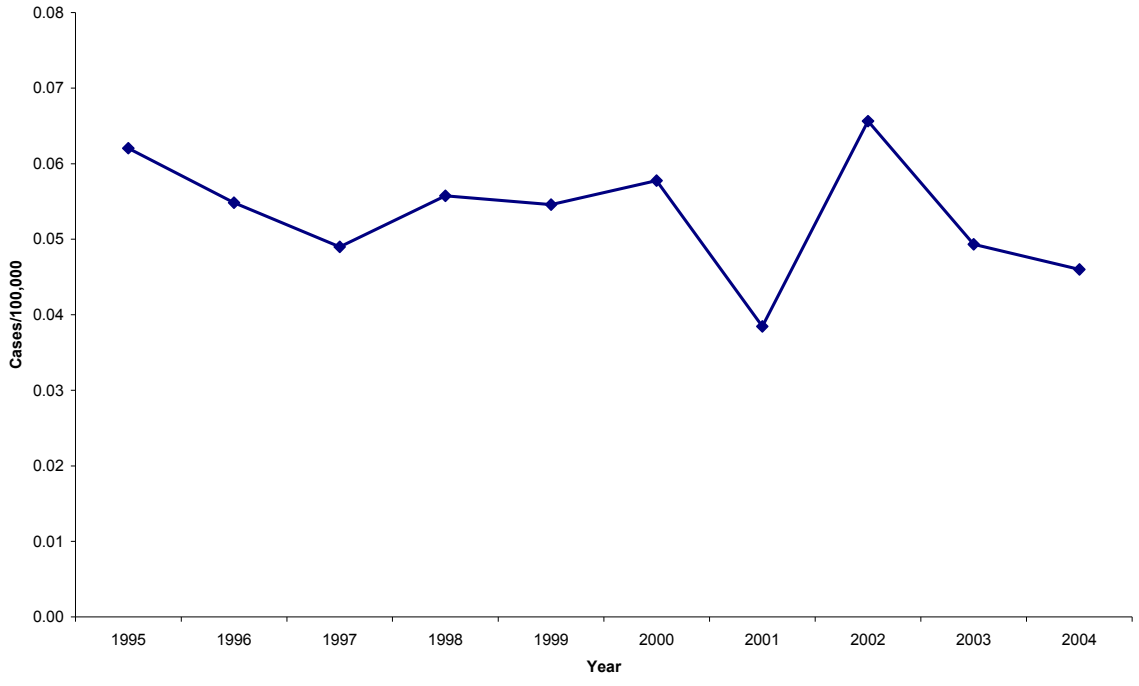
Due to the extremely high potency of the toxin, botulism is included among the potential bio-terrorist threats. Following laboratory accidents, the toxin has also caused symptoms on inhalation, with a substantially reduced incubation period.

10-year trend

Data from 20 EU Member States and Norway are available for the period 1995–2004. Cyprus, Ireland, Malta, Portugal and Iceland reported for only some of the years, while Luxembourg and Liechtenstein submitted no reports. The majority of country reports refer to foodborne botulism cases.

In all 2 388 human cases of botulism were reported over this ten-year period. Poland, with 850 cases, reported the highest number, accounting for 35% of the total.

Figure 4.5.1. Incidence rate of botulism cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein and Luxembourg.

The incidence trend appears to be stable. At the national level, occasional peaks were observed, probably due to outbreaks, such as in Lithuania in 2002, Slovakia in 2000 and Portugal in 2000.

The situation in 2005

In 2005, a total of 152 cases were reported by 22 countries but only five reported 20 or more cases. Lithuania reported the highest incidence (0.15 per 100 000), while the overall incidence rate for Europe is estimated at 0.03 per 100 000.

Table 4.5.1. Number of human botulism cases in the EU and EEA/EFTA, 2005

Country	Report type*	Confirmed cases	Incidence /100 000
Austria	C	3**	0.04
Belgium	C	0	0.00
Cyprus	C	0	0.00
Czech Republic	C	4	0.04
Denmark	—	0	0.00
Estonia	C	0	0.00
Finland	—	—	—
France	C	20	0.03
Germany	C	22	0.03
Greece	C	0	0.03
Hungary	C	5	0.05
Ireland	—	—	—
Italy	C	25	0.04
Latvia	C	0	0.00
Lithuania	C	5	0.15
Luxembourg	—	—	—
Malta	C	0	0.00
Netherlands	—	—	—
Poland	C	23	0.06
Portugal	C	1	0.01
Slovakia	C	—	—
Slovenia	C	1	0.05
Spain	C	8	0.02
Sweden	C	1	0.01
United Kingdom	C	29	0.05
EU total		**147**	**0.03**
Iceland	C	0	0.00
Liechtenstein	—	—	—
Norway	C	5	0.11
Total		**152**	**0.03**

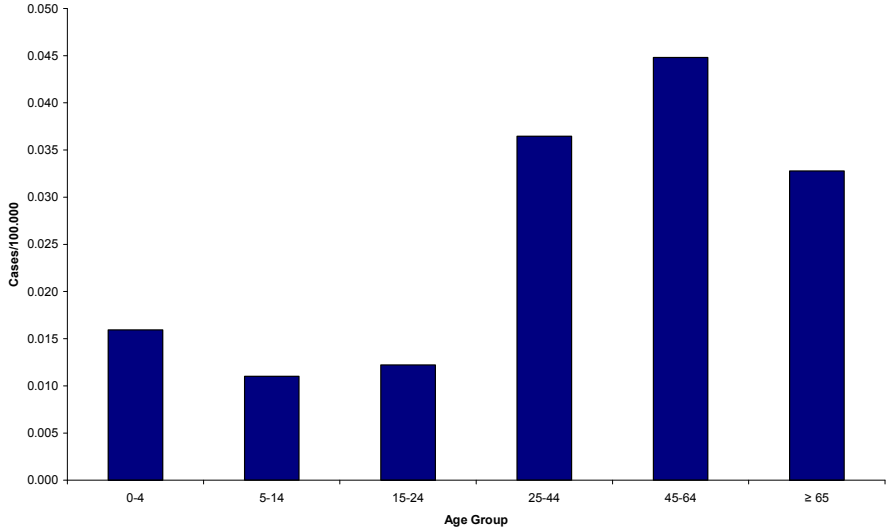
Source: Country reports. *C: Case-based report; —: No report.

**Probable cases only.

Age and gender distribution

The highest incidence was reported in the age group 45–64 years (0.04 per 100 000), followed by the 25–44 year olds (data provided by 13 countries). The gender ratio of male to female is 1.9:1 (data provided by 13 countries, 85 cases).

Figure 4.5.2. Age-specific incidence distribution of botulism for selected European countries, 2005 (n = 83)



Source: Country reports. Reports with age-specific data were available from: Austria, Czech Republic, Germany, Italy, Poland, Portugal, Spain, Sweden and Norway.

Seasonality

In 2005, data on the month of report are only available for 60 cases reported by nine Member States, Norway and Iceland. These data show two peaks, one in June and one in November, but the significance of this finding is doubtful.

Conclusions

- The trend of the incidence of botulism appears to be stable over the years, so the background risk remains unchanged.
- Botulism appears to be a problem in only a few countries of Europe.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N

Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	obligatory, countrywide, based on a double system of reporting Botulism	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland										
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious	C	Co	P	C-B	Y	Y	N	N	Y

	Diseases									
Portugal	Botulism Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Botulism	C	Co	P	C-B	Y	N	Y	Y	Y

4.6 Brucellosis

Brucellosis is a communicable disease caused by bacteria of the genus *Brucella*. The common reservoirs for the *Brucella* bio-variants pathogenic for humans are: *Brucella abortus* (cattle), *Brucella canis* (dogs), *Brucella melitensis* (sheep and goats), and *Brucella suis* (pigs). Brucellosis occurs worldwide but the Mediterranean region has been particularly affected.

Humans become infected by direct or indirect contact with animals or with contaminated animal products (including unpasteurised milk and dairy products) or by the inhalation of aerosols.

After an incubation period of five to 60 days, symptoms may appear either acutely or insidiously. Untreated, they may become a chronic disease. The various clinical presentations include systemic (fever, weakness, obnubilation, arthralgia) and organ-specific symptoms (including meningo-encephalitis and endocarditis). Untreated, brucellosis can lead to death. Prolonged antibiotic treatment is usually effective.

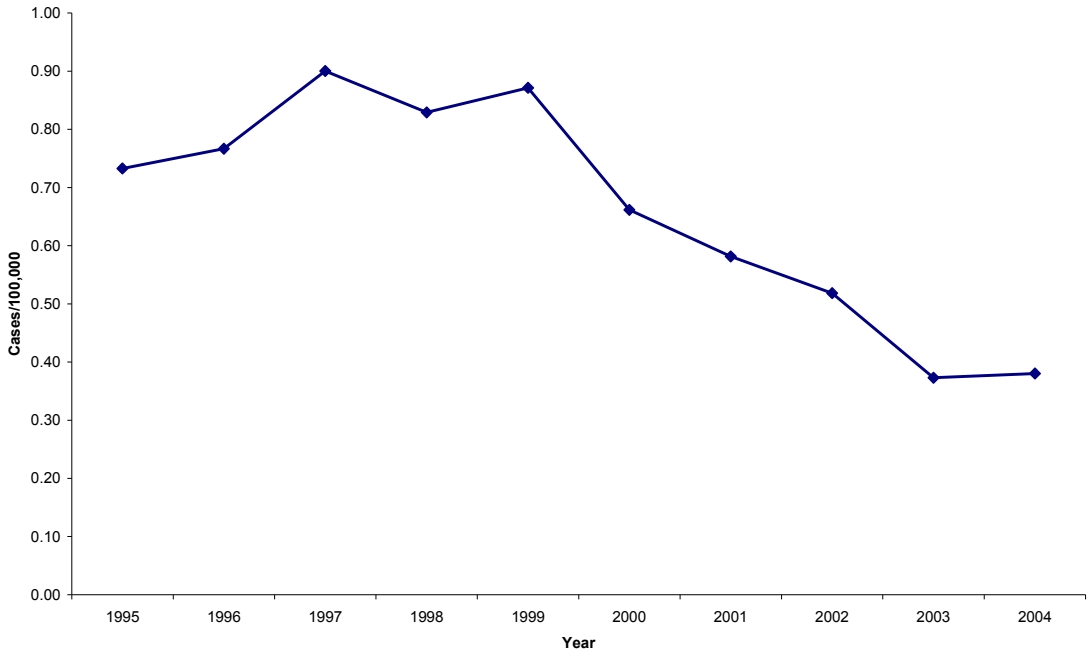
Control measures include animal vaccination and/or test-and-slaughter of infected animals, as well as pasteurisation of milk and dairy products. Health education is also important, because traditional habits and beliefs might impede the widespread application of control measures.

10-year trends

Data from all 25 EU Member States plus Iceland and Norway are available for the period 1995–2004.

The number of cases has been steadily declining from 4 088 in 1997 to 1 744 in 2004 (see figure 4.6.1).

Figure 4.6.1. Incidence rate of brucellosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat and country reports.

Table 4.6.1. Number of brucellosis cases, 1999–2005 (OBF and ObmF([a]) status is indicated)

	1999	2000	2001	2002	2003	2004
Total cases						
Austria (OBF/ObmF)	2	2	2	4	1	1
Belgium(OBF/ObmF)	1	0	1	1	0	8
Cyprus	0	1	1	7	5	1
Czech Republic (OBF/ObmF)	0	0	0	0	0	0
Denmark([b]) (OBF/ObmF)	1	1	18	16	14	4
Estonia	0	0	0	0	0	0
Finland (OBF/ObmF)	0	0	1	0	1	1
France([c])	55	43	22	36	27	21
Germany (OBF/ObmF)	21	27	25	35	27	32
Greece	451	334	379	327	255	223
Hungary (ObmF)	2	1	4	0	0	0
Ireland (ObmF)	19	15	14	4	5	60
Italy	1 129	801	343	820	—	398
Latvia	0	0	0	0	0	0
Lithuania	0	0	0	0	0	1
Luxembourg	1	0	0	1	0	0
Malta	0	0	0	1	0	0
Netherlands (OBF/ObmF)	1	3	1	5	4	8
Poland	3	6	3	2	4	1
Portugal([d])	686	507	40	206	139	39
Slovakia	2	0	0	0	1	0
Slovenia	1	0	1	1	1	0
Spain	1 519	1 104	924	886	596	589
Sweden (OBF/ObmF)	0	1	2	5	3	3
United Kingdom([e]) (OBF/ObmF)	17	20	27	38	24	31
EU total	3911	2866	1808	2395	1107	1421
Iceland	0	0	0	0	0	0
Liechtenstein	—	—	—	—	—	—
Norway	1	1	2	3	3	2
Total	3912	2867	1810	2398	1110	1423

Source: Eurostat.

(a) OBF/ObmF: Officially Brucellosis free/Officially B. melitensis free.

(b) In Denmark, Brucellosis in humans is not a notifiable disease.

(c) In France, 64 departments are ObmF.

(d) In Portugal, Azores are OBF/ObmF.

(e) In the United Kingdom, Great Britain and Northern Ireland are ObmF.

The situation in 2005

Twenty-six countries reported 1 429 cases in 2005, with an overall incidence of 0.31 per 100 000. Portugal (1.40 per 100 000), followed by Ireland (1.29 per 100 000) reported the highest incidence rates.

Table 4.6.2. Number of reported cases of brucellosis, 2005

Country	Report type*	Confirmed cases	Incidence /100 000
Austria (OBF/ObmF)([a])	C	2	0.02
Belgium (OBF/ObmF)	C	2	0.02
Cyprus	C	2	0.27
Czech Republic (OBF/ObmF)	C	1	0.01
Denmark ([b]) (OBF/ObmF)	—	0	0.00
Estonia	C	0	0.00
Finland (OBF/ObmF)	C	1	0.02
France ([c])	C	35	0.06
Germany (OBF/ObmF)	C	31	0.04
Greece	C	127	0.04
Hungary (ObmF)	C	1	0.01
Ireland (ObmF)	C	53	1.29
Italy	C	678	1.16
Latvia	C	0	0.00
Lithuania	C	0	0.00
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands (OBF/ObmF)	C	5	0.03
Poland	C	3	0.01
Portugal	C	147	1.40
Slovakia	C	0	0.00
Slovenia	C	0	0.00
Spain	C	314	0.73
Sweden (OBF/ObmF)	C	14	0.16
United Kingdom ([e]) (OBF/ObmF)	C	12	0.02
EU total		**1 428**	**0.31**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	C	1	0.02
Total		**1 429**	**0.31**

Source: Country reports. *C: Case-based report; 0: No cases reported; —: No report.

(a) OBF/ObmF: Officially Brucellosis free/Officially B. melitensis free.

(b) In Denmark, Brucellosis in Humans is not a notifiable disease.

(c) In France, 64 departments are ObmF.

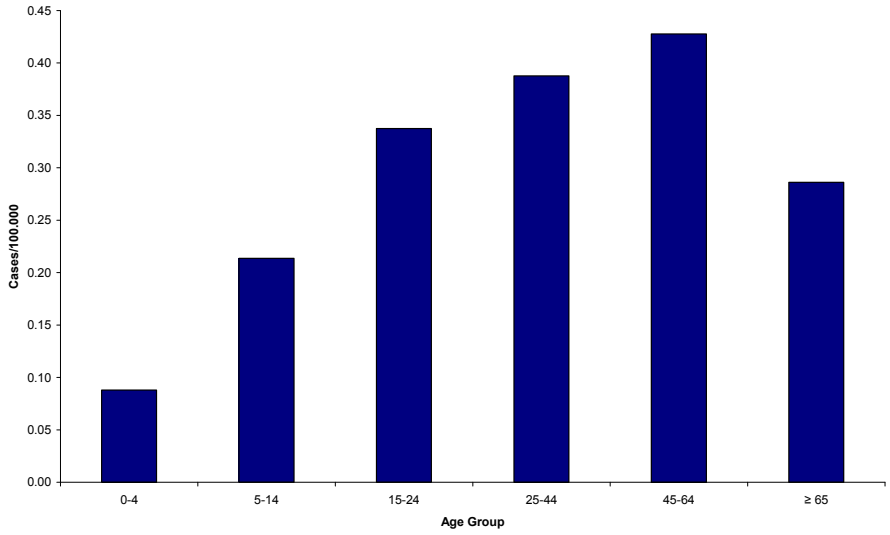
(d) In Portugal, Azores are OBF/ObmF.

(e) In the United Kingdom, Great Britain is OBF, Great Britain and Northern Ireland are ObmF.

Age and gender distribution

The highest incidence was reported in the age group 45–64 years (0.43 per 100 000), followed by the 25–44 year-olds (0.39 per 100 000) (figure 4.6.2).

Figure 4.6.2 Age-specific incidence distribution of brucellosis for selected European countries, 2005 (n = 1 149)



Source: Country reports. Reports with age-specific data were available from: Austria, Cyprus, Czech Republic, France, Germany, Hungary, Ireland, Italy, Poland, Portugal, Spain and Sweden.

Data on gender were available for 1 153 cases in 2005. The overall gender ratio of males to females was 1.7:1 (table 4.6.3) although the opposite was seen in, for instance, Germany (where 52% of cases were reported in women) and Sweden (with a ratio of male to female of 1:3).

Table 4.6.3. Number of brucellosis cases by gender, 2005 (n (%))

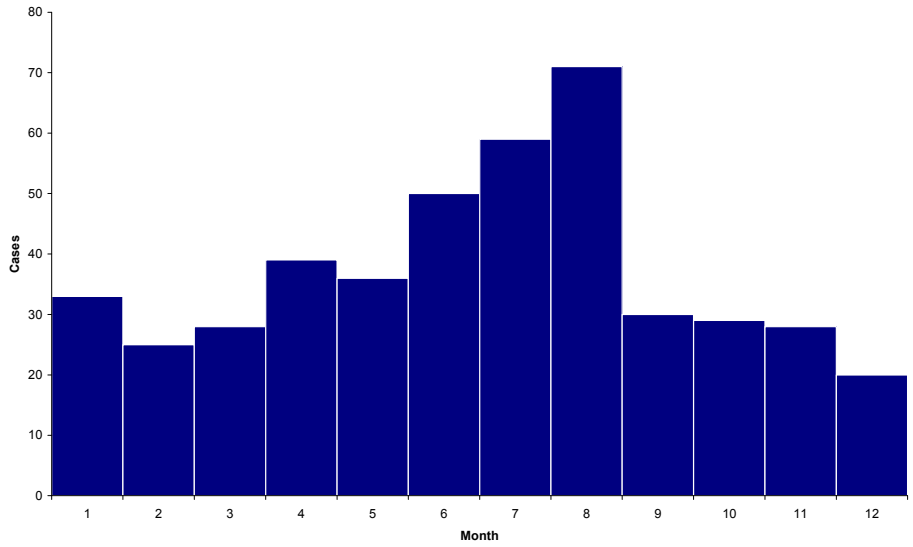
	Cases			Incidence /100 000	
Country	**Male**	**Female**	**Unspecified**	**Male**	**Female**
Austria	2	0	0	0.05	0.00
Belgium	0	0	2	—	—
Cyprus	2	0	0	0.54	0.00
Czech Republic	0	0	1	—	—
Denmark	—	—	—	—	—
Estonia	0	0	0	0.00	0.00
Finland	0	0	1	—	—
France	20	15	0	0.07	0.05
Germany	13	16	2	0.03	0.04
Greece	—	—	—	—	—
Hungary	1	0	0	0.02	0.00
Ireland	49	4	0	2.39	0.19
Italy	399	279	0	1.41	0.93
Latvia	0	0	0	0.00	0.00
Lithuania	0	0	0	0.00	0.00
Luxembourg	0	0	0	0.00	0.00
Malta	0	0	0	0.00	0.00
Netherlands	0	0	5	—	—
Poland	3	0	0	0.02	0.00
Portugal	80	67	0	1.57	1.23
Slovakia	—	—	0	—	—
Slovenia	0	0	0	0.00	0.00
Spain	153	37	6	0.72	0.17
Sweden	3	9	2	0.07	0.20
United Kingdom	0	0	12	—	—
EU total	**725**	**427**	**31**	**0.33**	**0.19**
Iceland	—	—	—	—	—
Liechtenstein	—	—	—	—	—
Norway	0	1	0	0.00	0.04
Total	**725 (61%)**	**428 (36%)**	**31 (3%)**	**0.33**	**0.19**

Source: Country reports.

Seasonality

In 2005, the highest numbers of reported cases were seen in the summer, with 40% of cases occurring from June to August.

Figure 4.6.3. Distribution of brucellosis cases by month, for selected European countries, 2005, (n = 448)



Source: Country reports. Reports with seasonal data were available from: Austria, Belgium, Cyprus, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Spain, Sweden, United Kingdom and Norway; while Estonia, Latvia, Lithuania, Luxembourg, Malta, Slovakia and Slovenia reported no cases.

Imported cases

Overall, imported cases accounted for 5% of the total and were reported by seven countries. Of these, four (Austria, Germany, the Netherlands and Sweden) are considered as OBF/ObmF. It is noteworthy that Germany for example, considered as OBF/ObmF, reported 14 domestic cases in 2005.

Table 4.6.4. Number of brucellosis cases by origin of infection, 2005 (n (%))

	Domestic	Imported	Unknown	**Total**
Austria	0	2 (100)		**2**
Belgium			2 (100)	**2**
Cyprus	2 (100)			**2**
Czech Republic	1 (100)			**1**
Finland			1 (100)	**1**
France	6 (17)	29 (83)		**35**
Germany	14 (45)	17 (55)		**31**
Hungary		1 (100)		**1**
Ireland			7 (100)	**7**
Italy	632 (100)			**632**
Netherlands		2 (100)		**2**
Poland		3 (100)		**3**
Portugal	147 (100)			**147**
Spain	196 (100)			**196**
Sweden		4 (67)	2 (33)	**6**
United Kingdom			19 (100)	**19**
Total	998 (92)	55 (5)	34 (3)	**1 087**

Source: Country reports.

Conclusions

- The general decreasing trend of the last six years in the EU MS, Iceland and Norway continued in 2005 with the number of new cases decreasing in most countries.
- Some countries classified as 'officially Brucellosis free' (OBF) or 'officially *B. melitensis* free' (ObmF) did, however, report domestic cases in 2005. However, this may be misleading as it is known that in, for example, Germany, 'domestic' cases are actually usually related to the (private) import of food from endemic countries or to cases among laboratory personnel.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	Obligatory, countrywide, based on a double system of reporting Brucellosis	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases	C	Co	P	C-B	Y	Y	Y	N	Y

	System									
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Brucellosis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Brucellosis	O	Co	A	C-B	Y	N	Y	Y	Y

4.7 Campylobacteriosis

Campylobacteriosis is an enteritis caused by bacteria belonging to the genus *Campylobacter,* found in the reservoirs poultry, cattle, pigs, wild birds and wild mammals.

The most frequent mode of transmission is through the consumption of contaminated food (mainly poultry) or water. Other risk factors include swimming in natural surface-waters and direct contact with infected animals.

After an incubation period of 2–5 days (range 1–10 days) the clinical picture is generally characterised by severe abdominal pain, watery and/or bloody diarrhoea and fever. Usually, symptoms last for a few days and the disease is self-limiting but occasionally they will persist and result in hospitalisation. Antimicrobial therapy is seldom needed.

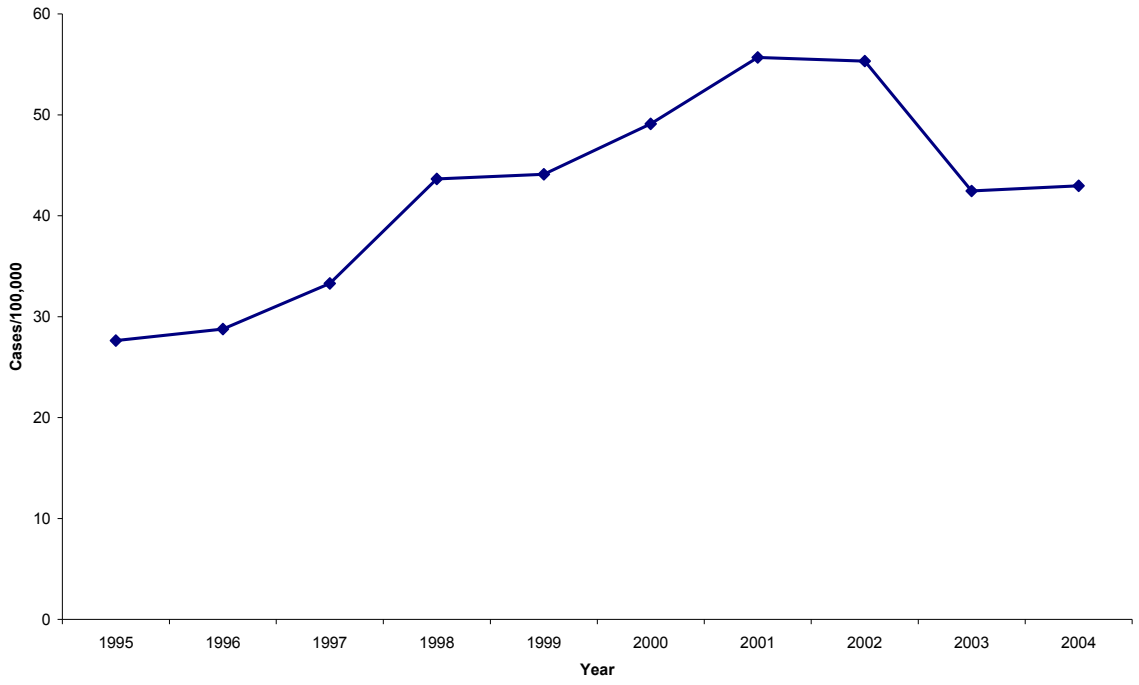
Campylobacter infection has been associated with complications such as reactive arthritis (5–10% of cases) and, on rare occasions, Guillain-Barré syndrome (post-infective polyneuropathy).

As a prophylactic measure, control of *Campylobacter* colonisation in poultry is important, as well as hygienic processing of meat, and the protection and control of private drinking water supplies.

10-year trends

Fourteen EU Member States, Iceland and Norway provided data for the whole period, while Cyprus, Portugal and Liechtenstein did not provide any reports. The incidence of campylobacteriosis showed a steady increase from 85 000 cases in 1995, to between 180 000 and 190 000 cases more recently, although this increase could also be a result of better reporting.

Figure 4.7.1. Incidence rate of human campylobacteriosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Cyprus, Liechtenstein and Portugal.

The situation in 2005

In 2005, 200 570 cases were reported (overall incidence of 45.11 per 100 00) by 23 EU Member States, Iceland and Norway, with the highest incidence reported by the Czech Republic (296.15 per 100 000), followed by United Kingdom (87.95 per 100 000). There is a wide variability in reporting systems between countries and this, combined with the high degree of under-reporting known to occur in many countries, makes direct comparisons between them very difficult. Alternative sources of information, i.e. returning travellers used as sentinels, indicates a very large under-reporting of cases in some of the Member States[1].

Based on the 2005 data[2], Campylobacteriosis is clearly the most frequently reported zoonosis in humans within the EU that also shows a steadily increasing trend. The foodstuff with highest proportion (66%) of *Campylobacter* positive samples is fresh poultry meat but *Campylobacter* spp. are commonly found in faeces of poultry, cattle and pigs. Among sporadic cases, consumption of poultry meat, drinking water from untreated water sources, swimming in open waters, and contact with pets and other animals have all been identified as major sources of infection. Contaminated untreated water supplies and raw milk have been causes of major outbreaks.

Table 4.7.1. Number of human campylobacteriosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Nationally reported cases	Incidence /100 000	Enter-net reported cases	Incidence /100 000
Austria	C	5 093	62.06	5 093	63.40
Belgium	C	6 879	65.85	6 879	65.51
Cyprus	C	0	0.00	—	—
Czech Republic	C	30 268	296.15	30 268	296.75
Denmark	C	3 677	67.95	3 677	66.85
Estonia	C	124	9.21	124	9.54
Finland	C	4 002	76.42	4 002	76.96
France	C	2 049	3.29	2 048	3.41
Germany	C	62 114	75.29	62 114	75.3
Greece	A	—	—	—	—
Hungary	C	8 288	82.08	8 288	82.06
Ireland	C	1 803	43.88	1 803	43.95
Italy([a])	C	339	0.58	341	0.59
Latvia	C	0	0.00	0	0.00
Lithuania	A	694	20.26	—	—
Luxembourg	C	194	42.64	320	64.00
Malta	C	91	22.60	96	24.00
Netherlands	A	3 761	23.07	3 765	43.20
Poland	C	47	0.12	47	0.12
Portugal	—	—	—	—	—
Slovakia	C	2 204	40.93	2 203	39.34
Slovenia	C	1 037	51.91	1 088	54.40
Spain	C	5 542	12.88	338	0.82
Sweden	C	6 796	75.42	6 811	76.53
United Kingdom	C	52 800	87.95	50 879([b])	88.76
EU total		**197 802**	**44.99**	**190 185**	**43.25**
Iceland	C	135	45.98		
Liechtenstein	—	—	—		
Norway	C	2 633	57.16	2 631	49.7
Total		**200 570**	**45.11**	**192 816**	**43.40**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

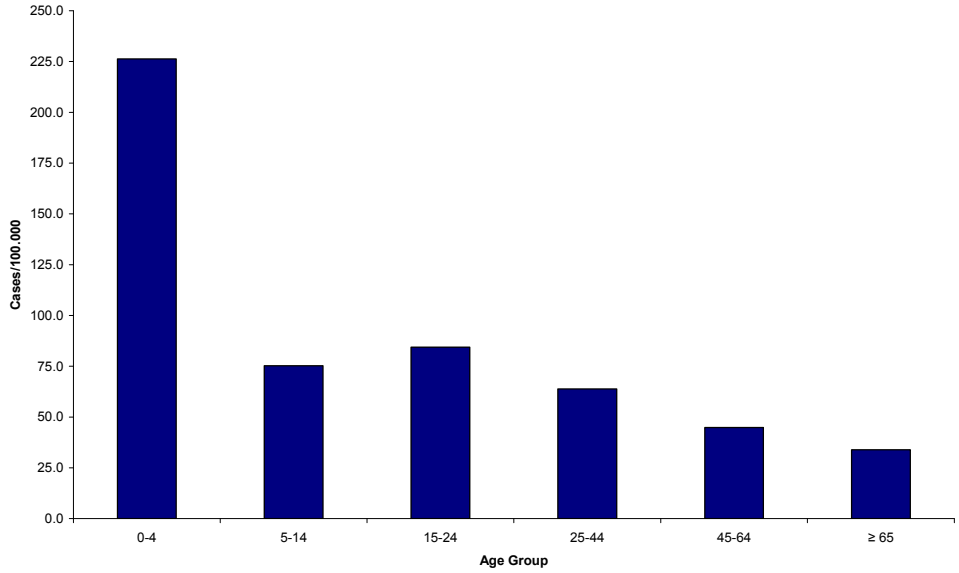
(a) Data from Italy based on laboratory surveillance system.

(b) Data for England, Scotland and Wales only

Age and gender distribution

Data on age groups were available from 14 Member States. The highest incidence was reported in children under four years of age (226.3 per 100 000) (figure 4.7.2). Data on gender were available from 10 countries (n = 57 823), with Cyprus and Latvia reporting zero cases. The male to female ratio was 1.12:1 with an incidence of 14.1 per 100 000 in men compared to an incidence of 12.0 per 100 000 in women.

Figure 4.7.2. Age-specific incidence distribution of human campylobacteriosis for selected European countries, 2005 (n = 130 245)

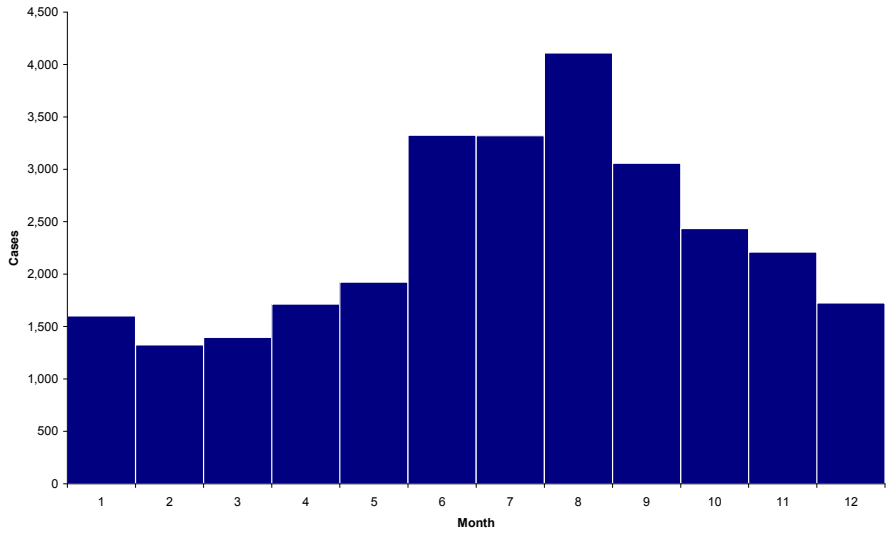


Source: Country reports. Reports with age-specific data were available from: Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Ireland, Malta, Netherlands, Slovakia, Spain, Sweden, Iceland and Norway; Cyprus and Latvia reported zero cases.

Seasonality

Data for seasonality were available from 11 countries, with Cyprus and Latvia reporting zero cases. Cases were mostly reported in the summer months between June and September (figure 4.7.3).

Figure 4.7.3. Distribution of human campylobacteriosis cases by month, for selected European countries, 2005 (n = 28 145)



Source: Country reports. Reports with seasonal data were available from: Austria, Denmark, Estonia, Ireland, Malta, Poland, Slovakia, Spain, Sweden, Iceland and Norway. Cyprus and Latvia reported zero cases.

Imported cases

Data on the importation status of reported cases were available from 13 Member States, Iceland and Norway. Of these, 55% were domestically acquired and 10% imported (for 35% of cases, the importation status was unknown). In Czech Republic, Lithuania and Slovakia, over 99% of reported cases were domestic, whereas in Sweden and Finland, 61% and 52% of reported cases, respectively, were imported.

Enter-net data

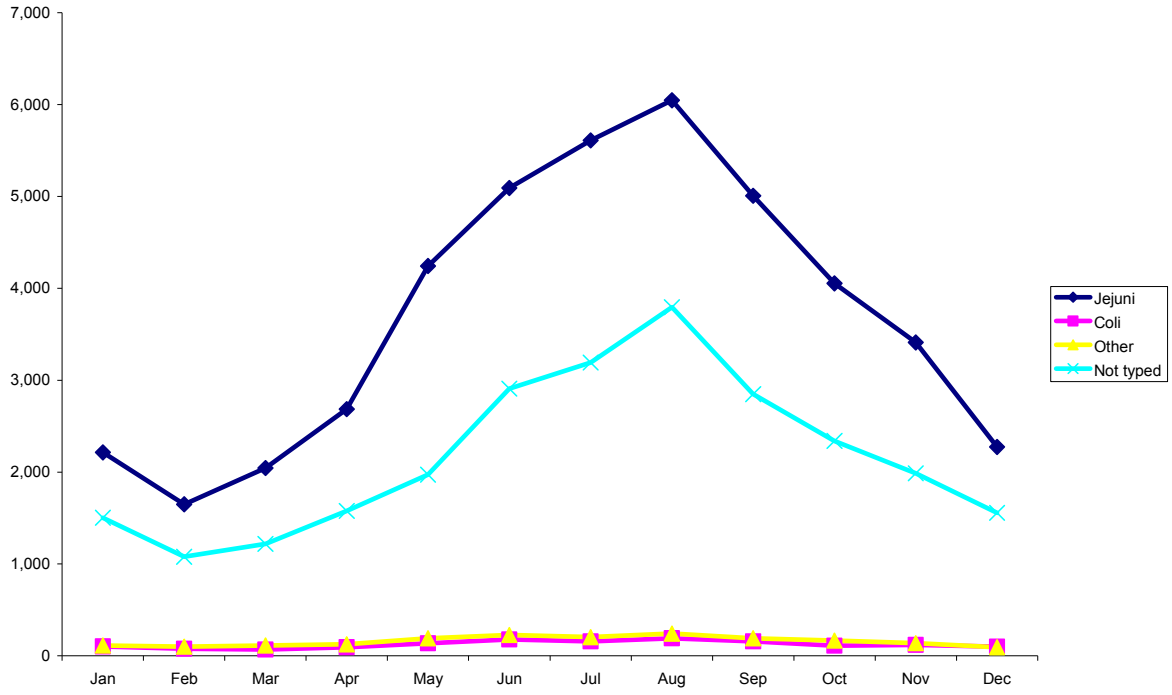
Twenty-four EU Member States and Norway reported 192 816 cases of campylobacteriosis to Enter-net in 2005.

Campylobacter species

Data on *Campylobacter* typing was available for 50 985 cases. *Campylobacter jejuni* was found to account for 36% of the species, *Campylobacter coli* for 1% and the other serotypes for 1%. A high proportion (61%) of confirmed cases had no speciation.

The seasonality of *Campylobacter* is clearly visible for both *Campylobacter jejuni* and *Campylobacter coli* infections. This is most clearly attributed to the *Campylobacter jejuni* infections which occur in much higher numbers during the summer months (figure 4.7.5).

Figure 4.7.4. Number of *Campylobacter jejuni* (n = 44 332), *Campylobacter coli* (n = 1 488), other *Campylobacter* species (n = 1 899) and unspecified species (n = 25 972) cases by month in 2005



Source: Enter-net.

Antimicrobial resistance

Between 2 000 and 6 700 *Campylobacter jejuni* and 300 and 670 *Campylobacter coli* strains were tested for antimicrobial resistance (tables 4.7.2 and 4.7.3). Of the tested *Campylobacter jejuni* strains, high proportions showed resistance to ciprofloxacin (39.3%). For *Campylobacter coli*, the resistance against ciprofloxacin and tetracycline was higher (50.1% and 41.8% respectively) than for

Campylobacter jejuni. For both *Campylobacter jejuni* and *Campylobacter coli*, almost all tested strains were sensitive for amoxicillin/clavulanic acid (99.2% and 99.1% respectively) and gentamicin (97.8% and 96.8% respectively).

Table 4.7.2. Antimicrobial resistance of *Campylobacter jejuni* strains in 2005

C. jejuni	Resistant		Intermediate		Sensitive		**Total tested**
	Freq	%	Freq	%	Freq	%	**Freq**
Gentamicin	30	1.4	17	0.8	2 083	97.8	**2 130**
Ampicillin	645	23.1	236	8.4	1 917	68.5	**2 798**
Amoxi/Clavulanic acid	4	0.2	12	0.6	2 001	99.2	**2 017**
Erythromicin	96	1.5	127	2.0	6 018	96.4	**6 241**
Tetracyclines	1 415	25.1	131	2.3	4 092	72.6	**5 638**
Nalidixic Acid	1 177	39.1	13	0.4	1 823	60.5	**3 013**
Ciprofloxacin	2 615	39.3	29	0.4	4 015	60.3	**6 659**

Source: Enter-net.

Table 4.7.3. Antimicrobial resistance of *Campylobacter coli* strains in 2005

C. coli	Resistant		Intermediate		Sensitive		**Total tested**
	Freq	%	Freq	%	Freq	%	**Freq**
Gentamicin	8	2.4	3	0.9	328	96.8	**339**
Ampicillin	66	17.0	50	12.9	272	70.1	**388**
Amoxi/Clavulanic acid	1	0.3	2	0.6	326	99.1	**329**
Erythromicin	59	9.1	43	6.6	547	84.3	**649**
Tetracyclines	272	41.8	21	3.2	357	54.9	**650**
Nalidixic Acid	185	52.6	4	1.1	163	46.3	**352**
Ciprofloxacin	334	50.1	3	0.4	330	49.5	**667**

Source: Enter-net.

Conclusions

- The incidence of campylobacteriosis has remained high since reaching a peak in 2002 and it is still the most commonly reported enteritis in the EU.
- The most affected age group in the EU is ≤ 4 years old.
- Campylobacteriosis shows a characteristic seasonality, with the highest reported numbers in the summer, from June to September.

- *Campylobacter jejuni* and *Campylobacter coli* strains show resistance in 37–48% of strains against ciprofloxacin but are still sensitive against amoxicillin/clavulanic acid and gentamicin.

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2. www.efsa.europa.eu.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Campylo	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y

Italy	ENTERNET	V	Se	P	C-B	Y	N	N	N	N
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	LSI: laboratory surveillance infectious diseases	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Campylobacteriosis	O	Co	P	C-B	Y	N	Y	Y	Y

4.8 *Chlamydia* infections

Chlamydiae are bacteria capable of generating ocular, pulmonary, uro-genital and systemic disease in humans.

In Europe the most epidemiologically relevant chlamydioses are sexually transmitted infections (STI). They are due to *Chlamydia trachomatis*: serovars D-K causing uro-genital disease and serovar L causing Lymphogranuloma Venereum (LGV: a systemic disease associated with inguinal pathology). The incubation period of chlamydial STIs is between two and three weeks.

Chlamydia trachomatis responds promptly to antibiotic treatment. However, uro-genital chlamydioses often remain asymptomatic and, undetected, can progress to cause permanent damage to the genital organs, compromising the reproductive potential.

Uro-genital chlamydioses are the most frequently reported bacterial STI in several European countries. LGV is now also increasing, having until recently occurred only sporadically in the western world and since 2004, LGV infection has been noted in several large European cities among men who have sex with men.

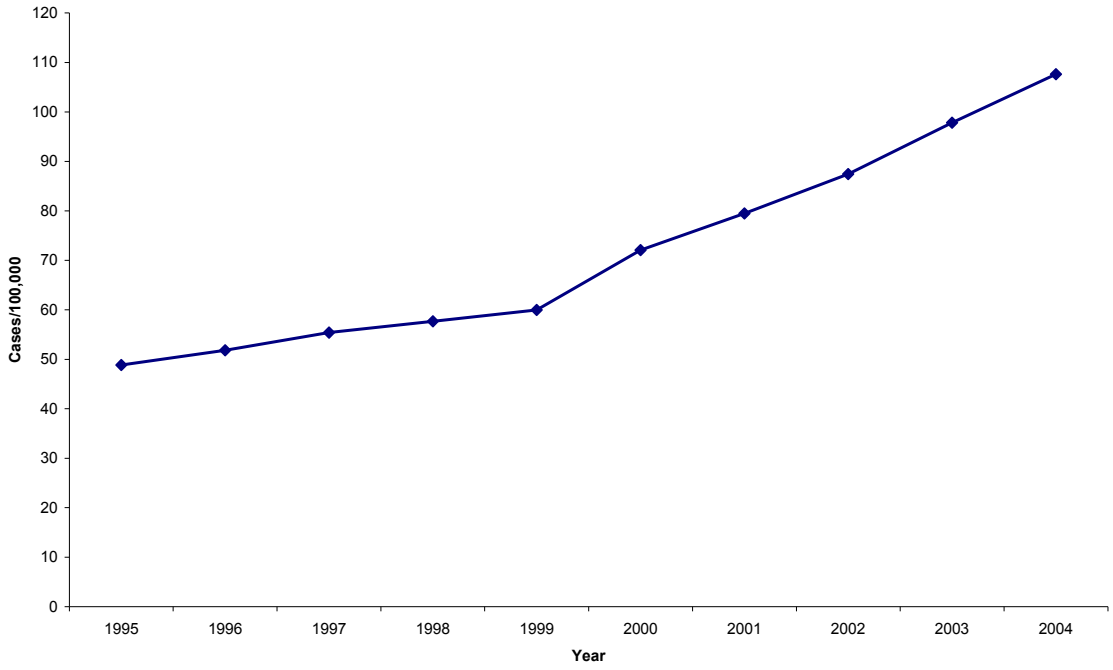
Sexual partners need to be evaluated and eventually treated to prevent mutual re-infection and/or further spread of disease.

10-year trends

14 countries provided *Chlamydia* infection incidence data for the whole period. Conversely, another 10 countries (Austria, Cyprus, Czech Republic, France, Germany, Hungary, Italy, Luxembourg, Portugal and Liechtenstein) did not provide data for any year during the period 1995–2004. The four remaining countries provided data for a range of from one to eight years of this period. International comparisons of any condition are generally inhibited by many differences between data collection methods (especially if the country operates a strict screening programme, for example) and by the variety of patient groups targeted for surveillance of this disease, but this is particularly true for *Chlamydia* infection, which is not a notifiable disease in many countries.

The overall trend is steadily increasing over this period. Quite dramatically increasing trends over the period 1995–2004 have been observed in the Nordic countries, Belgium, the United Kingdom and Ireland, while the opposite is seen in Estonia, Latvia and Slovakia (Lithuania shows a stable trend).

Figure 4.8.1. Incidence rate of *Chlamydia* cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data from Belgium, Denmark, Estonia, Finland, Greece, Ireland, Latvia, Lithuania, Malta, Netherlands, Poland, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Iceland and Norway.

The situation in 2005

In 2005, 203 691 cases of *Chlamydia* infection were reported by 17 countries, with almost 96% of cases from (in descending order) UK, Sweden, Denmark and Norway. The highest incidence rate was reported by Iceland with 552.45 per 100 000, followed by Denmark with 441.29 per 100 000.

The estimated overall incidence of *Chlamydia* infection for these 17 countries was 99.39 cases per 100 000 population (table 4.8.1).

Table 4.8.1. Number of *Chlamydia* cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	307	3.74
Belgium	C	2 091	20.02
Cyprus	C	1	0.13
Czech Republic	—	—	—
Denmark	C	23 880	441.29
Estonia	A	2 541	188.64
Finland	—	—	—
France	—	—	—
Germany	—	—	—
Greece	—	—	—
Hungary	A	585	5.79
Ireland	—	—	—
Italy	—	—	—
Latvia	C	621	26.93
Lithuania	C	563	16.44
Luxembourg	—	—	—
Malta	C	48	11.92
Netherlands	—	—	—
Poland	C	0	0.00
Portugal	—	—	—
Slovakia	C	105	1.95
Slovenia	C	229	11.46
Spain**	C	148	0.34
Sweden	C	33 060	366.87
United Kingdom	C	117 927	196.43
EU total		**182 106**	**91.03**
Iceland	C	1 622	552.45
Liechtenstein	—	—	—
Norway	A	19 963	433.38
Total		**203 691**	**99.39**

Source: Country reports. *A: Aggregated data report; C: Case-based report; —: No report.

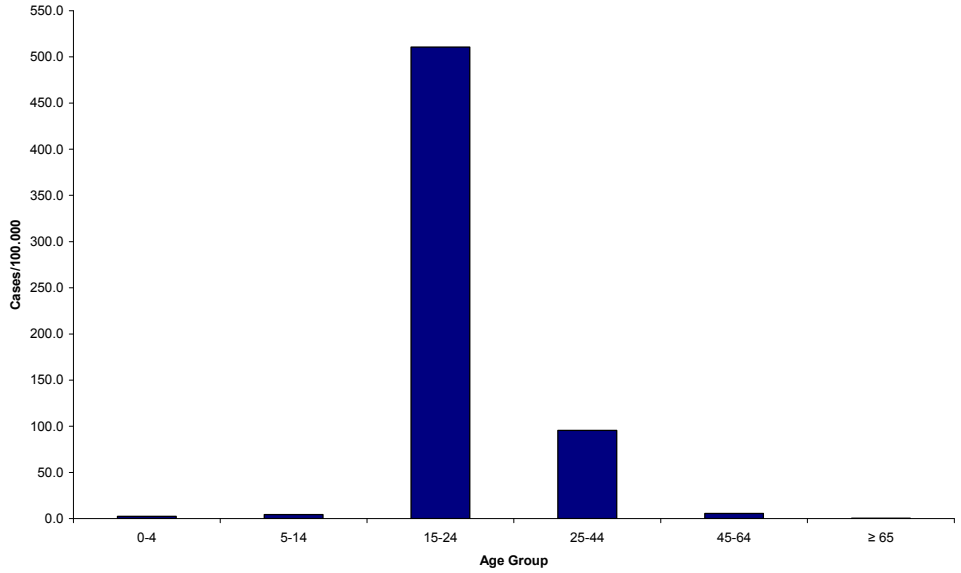
**Numbers for Spain are low as data gathered through a sentinel system.

Age and gender distribution

The highest incidence was reported in the age group 15–24 years of age (510.6 per 100 000), accounting for 66.8% of all cases for which data on age was available. *Chlamydia* infection in the age group 25–44 years accounted for 31.1% of the cases, with an incidence of 95.6 per 100 000.

Information on gender was available for 83 864 cases and *Chlamydia* infection is reported more often in women (61%) than in men (39%), with a female to male incidence ratio of 1.5:1 but there is a clear ascertainment bias due to the higher index of suspicion, more screening possibilities and more symptomatic cases occurring in women.

Figure 4.8.2. Age-specific incidence distribution of Chlamydia cases for selected European countries, 2005 (n = 83 137)



Source: Country reports. Reports with age-specific data were available from: Austria, Belgium, Cyprus, Denmark, Estonia, Latvia, Malta, Slovenia, Spain, Sweden, United Kingdom, Iceland and Norway.

Seasonality

No seasonal trends were observed in the reported *Chlamydia* infections in 2005, although there were slightly higher numbers reported in September and October.

Conclusions

- During the last ten years, the incidence of *Chlamydia* infection decreased in eastern and central European Member States, but appears to have increased steadily from 1995 to 2005 in western Europe. The highest incidence rates were reported by the Nordic countries where *Chlamydia trachmomatis* reporting is mandatory and where obligatory contact tracing is commonly practised.

- The figures described are certainly not representative of the true European epidemiological picture of *Chlamydia* infection due to the widely varying surveillance systems providing the data, and consequently need to be interpreted with caution. Nordic countries such as Sweden, where opportunistic screening for asymptomatic *Chlamydia* infection, contact tracing and notification are mandatory by law[1], provide a disproportionate share of all the cases of 2005.

- In most European countries genital chlamydial infection is not a notifiable disease even though it appears that genital chlamydial infection is the most common bacterial STI and increasing trends have been observed since the mid-1990s.

- Unlike gonorrhea or syphilis, *Chlamydia* infection affects mainly young people and especially young women. *Chlamydia* infection is frequently asymptomatic or causes few symptoms but can lead to serious complications such as ectopic pregnancy or infertility. A recent review of screening studies in Europe has shown that *Chlamydia trachomatis* prevalence in asymptomatic women ranged from 1.7% to 17% depending upon the setting, context and country, with a mode equal to 4% in women seeking contraception and 6% in women having cervical smears[2]. In order to control the *Chlamydia* infection disease burden in Europe, screening programmes targeting young people are crucial for early detection and treatment of all infected individuals and their partners.

- Although lymphogranuloma venereum (LGV) still rarely occurs in the western world[3], public health officials in the Netherlands noted an outbreak in January 2004 of LGV proctitis cases among MSM[4]. Since then, outbreaks of rectal lymphogranuloma venereum have been reported among MSM

in several large cities in western Europe[5]. LGV is not a reportable disease in most European countries. This hinders the public health response to these outbreaks. The emergence of this STI, in addition to syphilis outbreaks, is a major concern for the sexual health of MSM in Europe.

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	Chlamydia	V	Se	P	C-B	Y	Y	Y	N	N
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic										
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting HCV, Chlamydia	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
Finland	STD sentinel surveillance	V	Se	P	C-B	N	Y	N	N	N
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y

France	Renachla: surveillance of genital chlamydiae infection	V	Se	A	C-B	Y	N	N	N	Y
Germany										
Greece										
Hungary	STD surveillance	C	Se	P	A	N	Y	N	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	STI surveillance	C	Co	P	A	Y	N	Y	N	Y
Italy										
Latvia	STI and skin infections surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	Chlamydia	V	Se	P	C-B	Y	N	Y	N	N
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Netherlands	STI sentinel surveillance network	V	Se	P	C-B	N	Y	N	N	N
Norway	MSIS (group C-diseases: chlamydia)	C	Co	A	A	Y	N	N	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SPOSUR	C	Co	P	C-B	N	Y	N	N	Y
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Chlamydia infections	V	Co	A	C-B	Y	Y	Y	Y	Y

4.9 Cholera

Cholera is an acute enteric infection caused only by the bacterial serogroups O1 or O139 of the species *Vibrio cholerae*. The serogroup O1, further classified into different biotypes and serotypes is the most epidemiologically relevant one of the two. Serogroup O139 can produce the same clinical picture but, to date, did not produce pandemics. Humans are the only relevant reservoir, even though *Vibrios* can survive for a long time in coastal waters contaminated by human excreta.

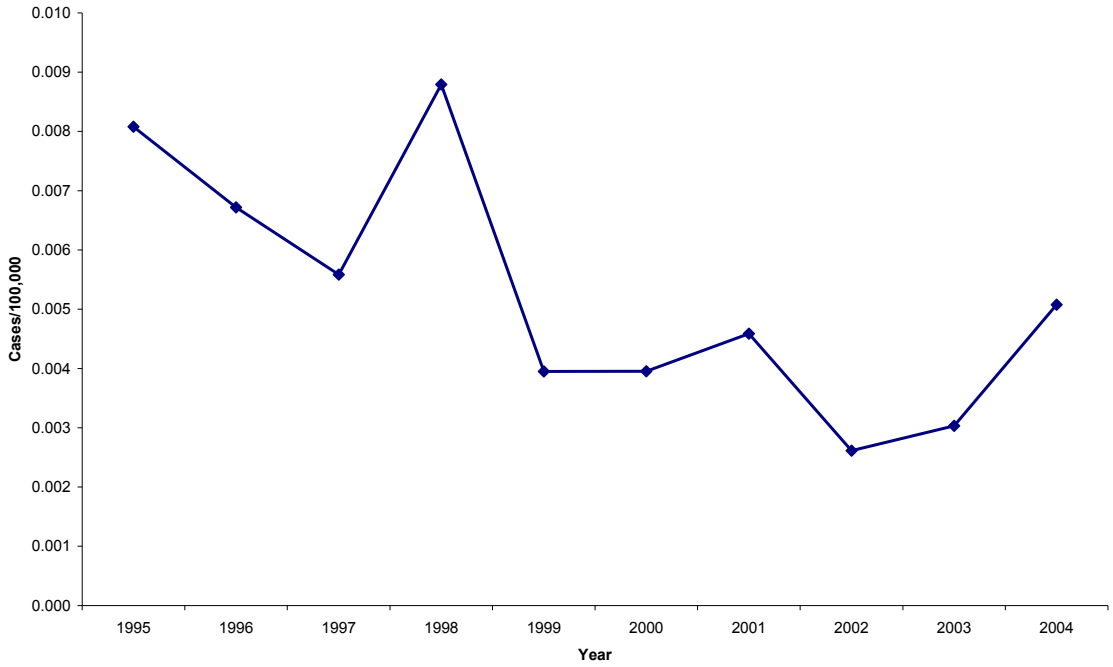
Ingestion of contaminated water and food, especially molluscs or fish eaten under-cooked, results in infection. After a short incubation of less than five days, the typical clinical picture might develop, characterised by vomiting and watery diarrhoea, so profuse that dehydration and even death can ensue. In most cases, though, symptoms are mild or absent and infected individuals become asymptomatic carriers.

With timely treatment (rehydration and antibiotics), the mortality of symptomatic cases is less than 1%. Cholera cases are subject to International Health Regulations (IHR). The disease has not been endemic in Europe for a long time, and thanks to high hygiene standards the potential for imported cases to generate further ones is considered to be low.

10-year trends

According to Eurostat, the number of reported cholera cases in the EU25 has been limited over the period and steadily declined after a peak (40 cases) in 1998 (figure 4.9.1). From 1995 to 2004, 237 cholera cases were reported (incidence: under 0.01 cases per 100 000) by the EU25, Iceland and Norway. Eleven countries (Cyprus, Estonia, Greece, Latvia, Lithuania, Luxembourg, Malta, Poland, Slovakia, Slovenia and Iceland) all reported no cases.

Figure 4.9.1. Incidence rate of cholera cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The situation in 2005

In 2005, 34 cases of cholera were reported by 20 countries. Belgium reported the highest incidence of 0.06 per 100 000 (six cases) followed by United Kingdom with 0.03 per 100 000 (20 cases). The Netherlands (four cases), Poland, Portugal, Sweden and Norway (each one case) reported the other cases. The overall incidence rate was 0.01 per 100 000, although, as most of these cases were confirmed as imported, the incidence rates are not quite an appropriate statistic for cholera.

Conclusions

- Cholera remains an imported disease in the EU.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	N

	and 6									
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Cholera Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Cholera	O	Co	P	C-B	Y	N	Y	Y	Y

4.10 Cryptosporidiosis

Cryptosporidia are protozoan (coccidia) parasites infecting a variety of animals (e.g. cattle, sheep, rodents, cats and dogs, but also birds, fish and reptiles). Human infections occur due to *Chriptosporidium parvum*, a species that also affects domestic animals.

In humans, asymptomatic infections are common, especially in immuno-competent individuals, who, after an incubation period averaging one week, may manifest an enteritis, spontaneously resolving over a couple of weeks. By contrast, immuno-compromised patients may develop profuse, life-threatening, watery diarrhoea that is very difficult to treat with currently available drugs.

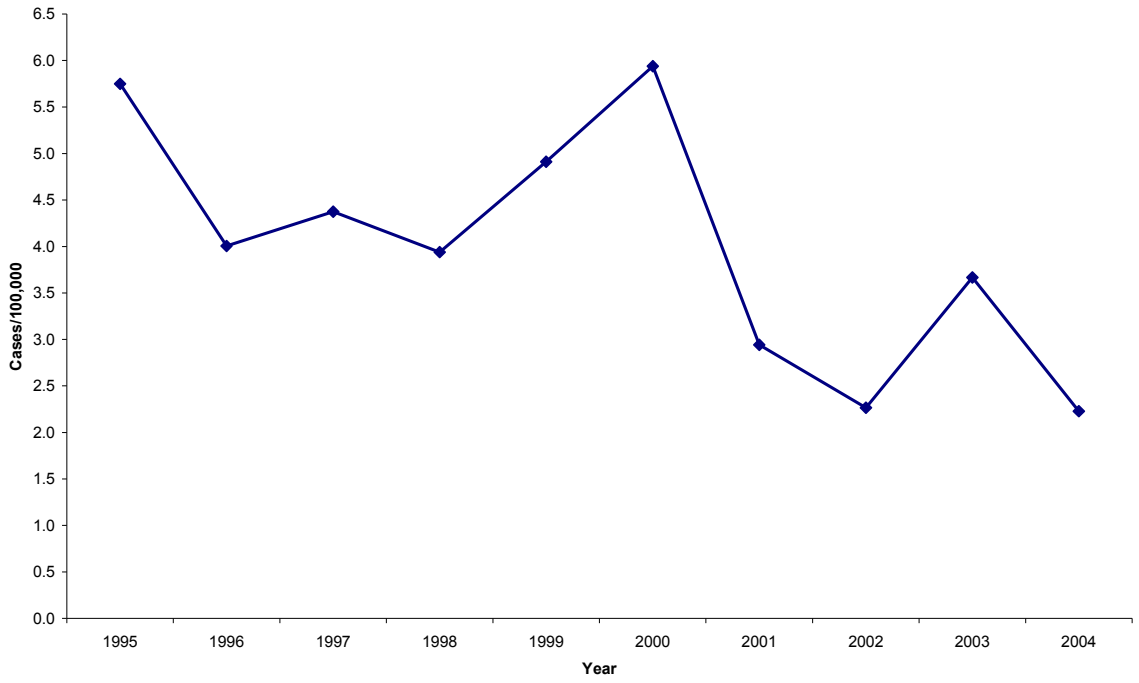
Person-to-person or animal-to-person disease transmission occurs mainly via the faecal-oral route through contaminated water and food. *Cryptosporidium* oocysts can survive for months in moist soil or water[1] and endure harsh environmental conditions (e.g. heat, cold, droughts) for extended periods of time.

Outbreaks have been reported in health and day-care centres, within households, among bathers, affecting participants in water sports in lakes and swimming pools, and in municipalities with contaminated public water supplies. Due to the resilience of the oocysts, water distribution systems are particularly vulnerable to contamination with *Cryptosporidium*, which can survive most disinfection procedures such as chlorination.

10-year trends

As cryptosporidiosis is not notifiable in many countries, trend data is scanty. Only Finland, Slovakia, Slovenia, Spain, Sweden and United Kingdom provided data for the whole period, while another nine countries provided data for at least some of the years. The incidence trend is influenced heavily by the UK data which accounted for 87.9% of the cases over this period.

Figure 4.10.1. Incidence rate of Cryptosporidiosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data from Belgium, Czech Republic, Estonia, Finland, Germany, Ireland, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Spain, Sweden and United Kingdom.

The situation in 2005

In 2005, 7 960 cases were reported by 16 countries, with Ireland (13.75 per 100 000) and the UK (9.26 per 100 000) reporting the highest incidence rates. Cryptosporidiosis is not a notifiable disease in a number of countries, (e.g. Austria). Further, not all the countries' surveillance systems have national coverage (two do not). Inter-country comparisons are particularly difficult due to differences in detection, investigation, case definitions, recording practices and the procedural/legal basis of reporting. Furthermore, the country incidence rates are likely to underestimate the actual burden of cryptosporidiosis due to the insensitivity of passive surveillance.

The overall incidence rate was 2.81 per 100 000.

Table 4.10.1. Number of Cryptosporidiosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Confirmed cases	Incidence /100 000
Austria	—	—	—
Belgium	C	357	3.42
Cyprus	C	0	0.00
Czech Republic	C	1	0.01
Denmark	—	—	—
Estonia	A	0	0.00
Finland	—	—	—
France	—	—	—
Germany	C	1 284	1.56
Greece	—	—	—
Hungary	C	0	0.00
Ireland	C	565	13.75
Italy	—	—	—
Latvia	C	0	0.00
Lithuania	C	0	0.00
Luxembourg	—	—	—
Malta	C	6	1.49
Netherlands	—	—	—
Poland	C	0	0.00
Portugal	—	—	—
Slovakia	C	0	0.00
Slovenia	C	9	0.45
Spain	C	108	0.25
Sweden	C	69	0.77
United Kingdom	C	5 561	9.26
EU total		**7 960**	**2.81**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	—	—	—
Total		**7 960**	**2.81**

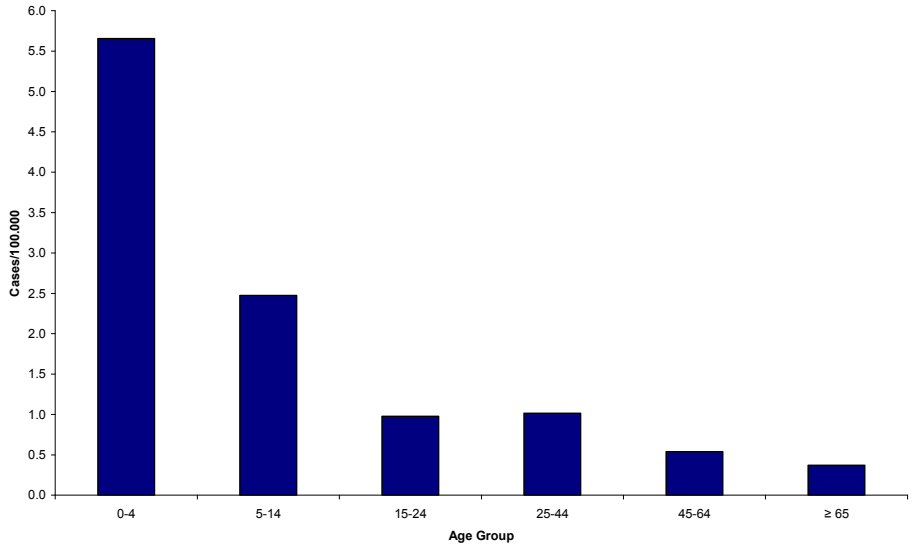
Source: Country reports. *A: Aggregated data report; C: Case-based report; —: No report.

Age and sex distribution

The majority of reported cases of cryptosporidiosis were found in the very young (figure 4.10.2). The highest incidence rates were in the 0–4 year-olds (5.66 per 100 000) followed by the 5–14 year-olds (2.47 per 100 000). One reason for these rates may be the effect of certain selection policies in

laboratories for screening specimens for cryptosporidiosis. Of the 1 820 cases for which the demographic data were available, there was no difference between infection in men (51%) and women (49%).

Figure 4.10.2. Age-specific incidence distribution of cryptosporidiosis cases for selected European countries, 2005 (n = 1 780)

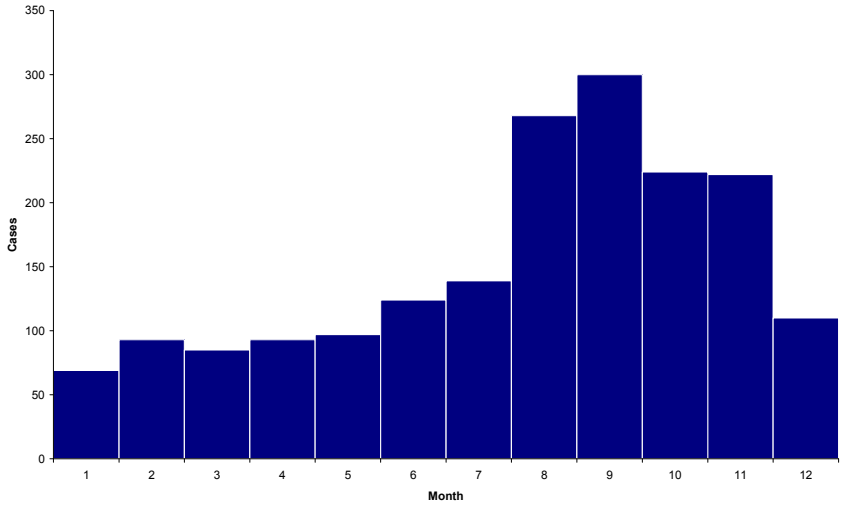


Source: Country reports. Reports with age-specific data were available from: Belgium, Czech Republic, Germany, Malta, Spain and Sweden.

Seasonality

The overall monthly case distribution suggests a peak in late summer and autumn. However, this data is strongly influenced by the German data which made up 70% of the total.

Figure 4.10.3. Distribution of cryptosporidiosis cases by month, for selected European countries, 2005 (n = 1 824)



Source: Country reports. Reports with seasonal data were available from: Belgium, Germany, Malta, Spain and Sweden.

Evidence from the UK suggests that cases of cryptosporidiosis in the spring are mainly caused by *Chriptosporidium parvum*, while cases in the autumn are frequently *Chriptosporidium hominis*. The seasonality of cryptosporidiosis has changed within the UK and the spring peak has disappeared in recent years, probably as a result of improved drinking water quality. The reasons for the autumn cases may be due to holiday travel and swimming pool use, but the evidence for this is poor.

Outbreaks

Cryptosporidium was implicated in several waterborne disease outbreaks studied by WHO, from 1986 to 1996 in the European Region[2].

Returning tourists from high endemic areas and swimming pool outbreaks may contribute to the autumn rise (figure 4.10.3) but it is difficult to identify failures in pool management practices. It is also possible that limitations in the infrastructure contribute to the increased disease burden. Careful outbreak investigations can help to pinpoint routes of disease transmission and identify areas for intervention.

Conclusions

- Cryptosporidiosis can be a life-threatening disease in immuno-compromised individuals and is of considerable concern in young children.
- The seasonal trends apparent from the country reports indicate recurrent exposure of the general public to *Cryptosporidium* with opportunities of communicable disease control.
- Targeted interventions such as upgrading water treatment plants with water filtration have been shown to reduce the disease burden from *Cryptosporidium*.
- Timely and complete surveillance data can help in the investigation of *Cryptosporidium* outbreaks for the identification of risk factors and guide policy recommendations to reduce the disease burden in the general population.

References

1. Smith HV, et al., The effect of free chlorine on the viability of cryptosporidium spp. oocysts. Medmenham, Water Research Centre, 1988 (report PRU 2023-M).

2. Water and Health. A joint report from the European Environment Agency and the WHO Regional Office for Europe. Bartram J, Thyssen N, Gowers A, Pond K, Lack T (eds) (2002) WHO Regional Publications (No 94).

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria										
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y

Republic										
Denmark										
Estonia	Obligatory, countrywide, based on a double system of reporting Cryptosporidiosis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France										
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy										
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway										
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia										
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden										

United Kingdom	UK Cryptosporidiosis	O	Co	P	C-B	Y	N	Y	Y	Y

4.11 Diphtheria

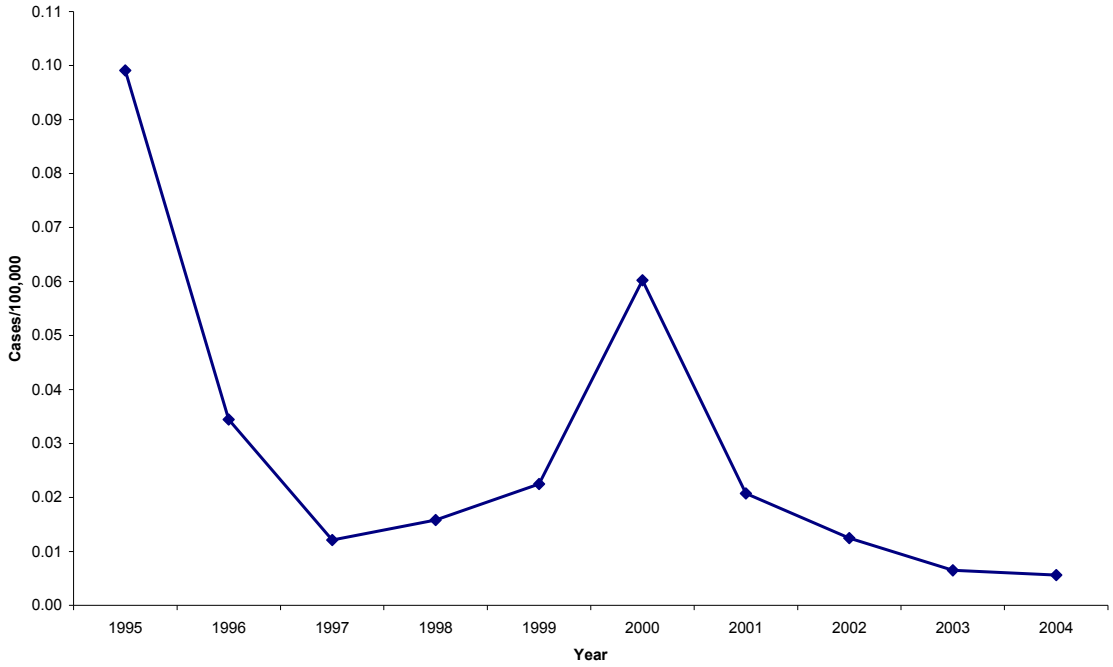
Diphtheria is an acute disease caused by toxin-producing strains of *Corynebacterium diphtheriae* (in some cases also by *Corynebacterium ulcerans*) bacteria, that is known to colonise mucous membranes.

Following infection, after a usually short incubation period (2–5 days), the release of the cytotoxin may produce characteristic lesions on the affected mucous membranes (tonsils, pharynx, larynx, nose) or wounds. Obstruction of the airway may follow. The toxin, once absorbed, reaches other organs and can cause myocarditis, paralytic symptoms and nephritis. In non-vaccinated individuals, and especially if proper treatment is delayed, death can occur in up to 10% of clinical cases despite antibiotics and the use of anti-sera, Diphtheria is transmitted mainly by direct projection (droplet spread). It is preventable by vaccination.

10-year trends

Data were available for the whole period for 25 EU countries, Iceland and Norway. Cases were notified from 15 countries, 12 countries notified zero cases for the whole period. Since 1995, the Baltic States, in particular Latvia, have been the countries most affected by Diphtheria. The incidence in Latvia reached 14.7 per 100 000 in 1995 with a second peak at 11 per 100 000 in 2000. In Estonia and Lithuania, the incidence was 1.3 and 1.2 per 100 000, respectively, in 1995 and gradually decreased over the ten-year period. In other countries, cases are observed sporadically and no particular trends can be observed.

Figure 4.11.1. Incidence rate of diphtheria cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

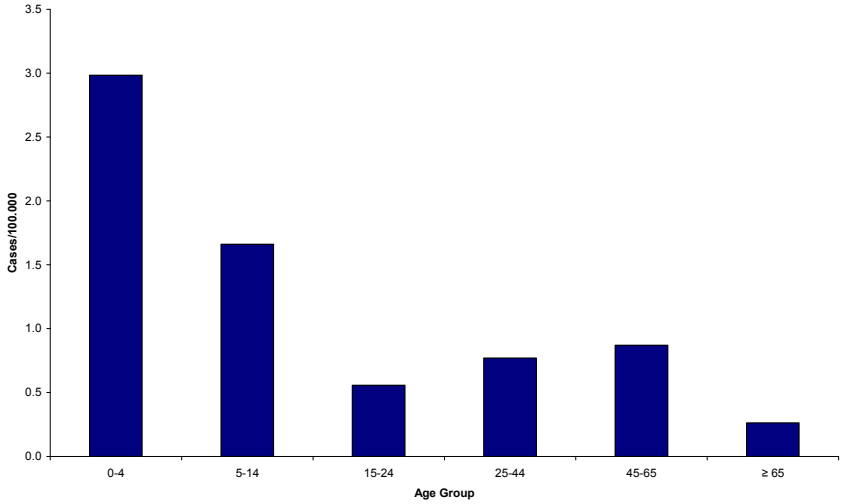
Situation in 2005

In 2005, only Latvia reported cases (20) with an incidence of 0.87 per 100 000. The 20 cases suggest that the overall European incidence rate is 0.007 per 100 000.

Age and gender distribution

The highest incidence rates were observed in the 0–4 year-olds (3.0 per 100 000) followed by the 5–14 year age group (1.7 per 100 000). Nine cases were in males and 11 cases were female.

Figure 4.11.2. Age-specific incidence distribution of diphtheria cases for selected European countries, 2005 (n = 20)

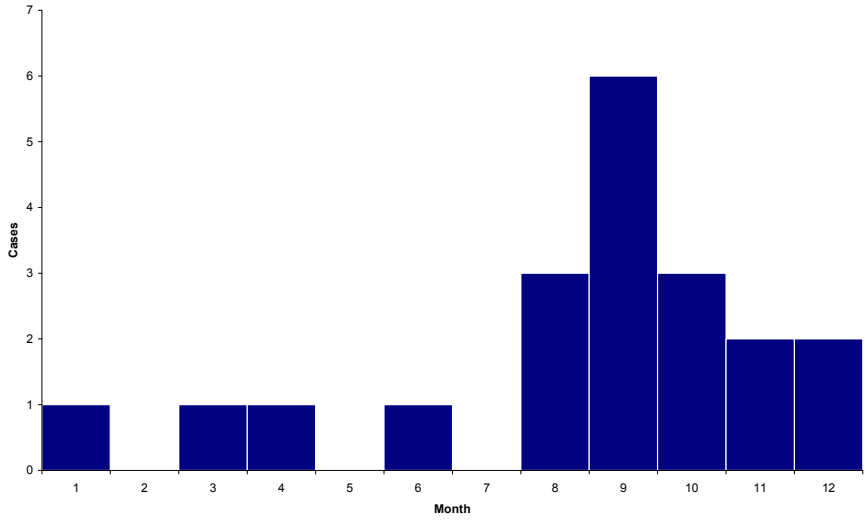


Source: Country reports. Reports with age-specific data were available from Latvia only.

Seasonality

In Latvia, the incidence of diphtheria peaked in September, but in the UK, seasonal trends were less apparent, although no cases were observed from October to December 2005.

Figure 4.11.3. Distribution of diphtheria cases by month, for selected European countries, 2005 (n = 20)



Source. Country reports. Data from Latvia only.

Imported cases

In Latvia, all the cases notified in 2005 were reported as autochthonous. In 2005, Germany had one imported case of diphtheria (a 4 year-old girl from Iraq).

Conclusion

- The general trend for diphtheria is that the incidence has greatly decreased all over Europe during the past 10 years, following the extended outbreak that occurred in the Russian Federation and the former Soviet Union during the 1990s.
- Since 1995, most of the cases are occurring in the Baltic States, particularly in Latvia.
- Currently, Latvia is still observing a small number of cases, although this is much less than in previous years.
- Not all the countries reported data so the overall picture is somewhat difficult to interpret.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register	C	Co	P	C-B	Y	Y	N	N	Y

	(NIDR)									
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Diphtheria Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y

Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Diphtheria	O	Co	P	C-B	Y	N	Y	Y	Y

4.12 Echinococcosis

Echinococcosis is a zoonotic disease caused by the larval stage (hydatid cyst) of tapeworms belonging to the species *Echinococcus*: *Echinococcus granulosus* (cystic hydatidosis) and *Echinococcus multilocularis* (alveolar hydatidosis). *Echinococcus granulosus* and *Echinococcus multilocularis* eggs are excreted, respectively, in the faeces of infected dogs and foxes and can be ingested by humans either by close contact with these animals either through poor hand-hygiene or contaminated food.

The most common location of cysts is the liver, but they may develop in almost any organ, including lungs, kidneys, spleen, nervous tissue, etc, years after the ingestion of the *echinococcus* eggs. In the case of cystic hydatidosis, symptoms usually appear due to the mass effect of the lesion. If leaks occur, hypersensitivity phenomena and seeding of cysts to distant sites may ensue. Alveolar hydatidosis invades tissues in a cancer-like fashion and, untreated, it is always fatal.

Patients are treated with surgery and the administration of anti-helminthic drugs.

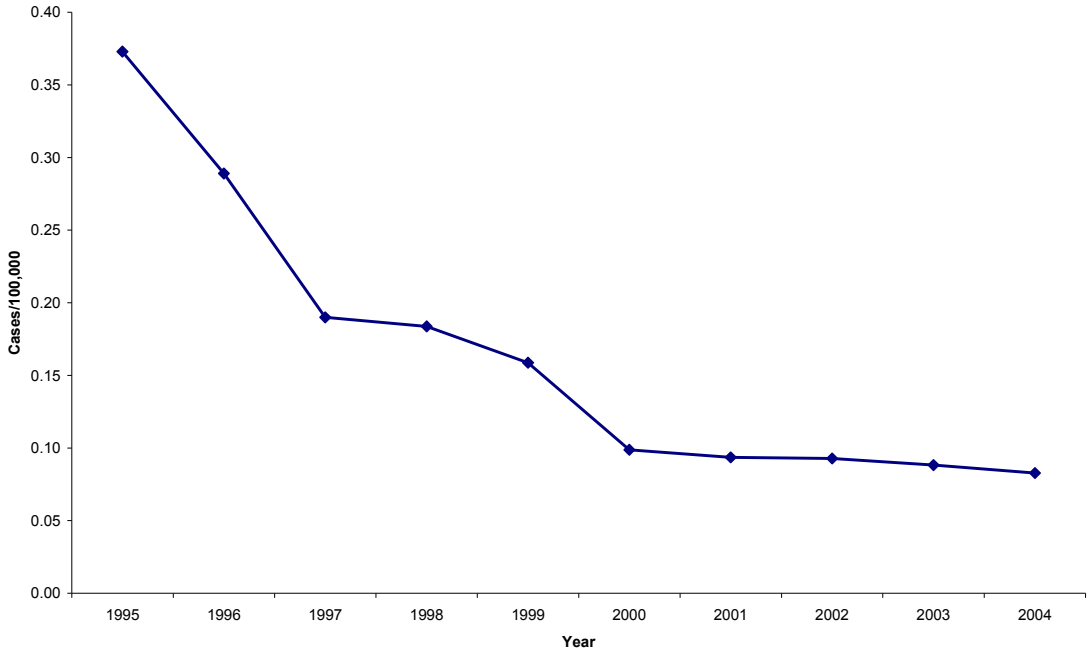
Cystic hydatidosis occurs where dogs have access to animal viscera, usually of sheep and cattle (intermediate hosts), containing cysts. Alveolar hydatidosis is restricted to northern countries, where foxes abound.

Poor hand hygiene, close contact with infected animals and ingestion of undercooked, unwashed food contaminated with *echinococcus* eggs (e.g. vegetables) are all risk factors. Public education campaigns to avoid exposure (e.g. hand-washing after dealing with dogs) and proper destruction of infested viscera of intermediate-hosts are effective control measures.

10-year trend

Data for the whole period was only available from 14 Member States and Norway, with the remainder all providing data for at least some of the period (Ireland, Luxembourg, Malta, Iceland and Norway all reported no cases over this ten-year period). The number of reported cases of echinococcosis has decreased over this period by approximately 50% (from 717 to 370, see figure 4.12.1). Spain, with 2 483, showed the highest cumulative number of reported cases (49% of the 5 073 EU reported cases) and the highest incidence over most of the period, followed by Greece. However, all countries have seen a dramatic decrease in reported cases over the 10-year period.

Figure 4.12.1. Incidence rate of echinococcosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data from all 25 Member States, Iceland and Norway.

The situation in 2005

In 2005, altogether 337 cases were reported by 22 countries. Lithuania (0.44 per 100 000), followed by Slovenia (0.30 per 100 000), reported the highest incidence rates. The overall incidence rate was 0.09 per 100 000.

Table 4.12.1. Number of echinococcosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	9	0.11
Belgium	C	8	0.08
Cyprus	C	1	0.13
Czech Republic	C	2	0.02
Denmark	—	—	—
Estonia	C	0	0.00
Finland	—	—	—
France**	C	17	0.03
Germany	C	109	0.13
Greece	C	10	0.09
Hungary	C	5	0.05
Ireland	C	0	0.00
Italy	—	—	—
Latvia	C	5	0.22
Lithuania	C	15	0.44
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands	—	—	—
Poland	C	34	0.09
Portugal	C	9	0.09
Slovakia	C	2	0.04
Slovenia	C	6	0.30
Spain	C	78	0.18
Sweden	C	12	0.13
United Kingdom	C	14	0.02
EU total		**336**	**0.09**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	C	1	0.02
Total		**337**	**0.09**

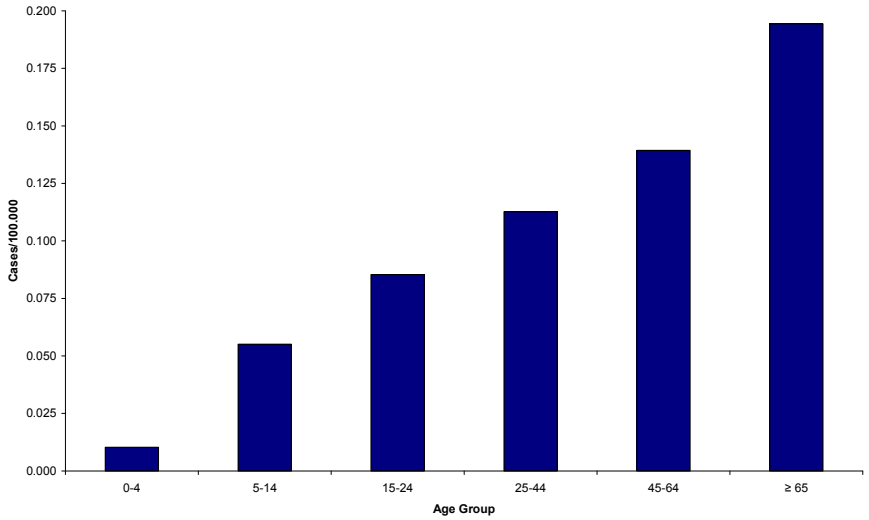
Source: Country reports. *C: Case-based report; —: No report.

**Includes only E multilocularis.

Age and gender distribution

There was a clear tendency for the incidence to increase with age, reaching an incidence of 0.19 per 100 000 in the over 65 year-olds (figure 4.12.2). This is clearly related to the long delay in developing symptomatic disease. Overall, the cases were more or less equally distributed between men (114) and women (120).

Figure 4.12.2. Age-specific incidence distribution of echinococcosis cases for selected European countries, 2005 (n = 235)



Source: Country reports. Reports with age-specific data were available from: Cyprus, Czech Republic, Germany, Hungary, Latvia, Poland, Slovakia, Spain, Sweden, United Kingdom and Norway.

Imported cases

Only three countries reported imported cases: Czech Republic (two), Germany (82) and Sweden (four).

Seasonality

Although there were more cases reported in March and April, cases were reported throughout the year. The long delay between infection and case ascertainment does not allow any analysis of seasonal patterns to be meaningful.

Conclusions

- The real number of cases is probably higher than the reported cases given the slow progression of the disease that remains asymptomatic for years.
- As a result of the long incubation period, cases are reported more often among adults and the age-specific incidence increases with age.
- This is a disease typically reported only on laboratory confirmation due to its specific clinical features, its severity and the need for surgical procedures in most of the cases.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y

Belgium										
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	Obligatory, countrywide Echinococcosis	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Echinococcus: "FranceEchino"	V	Co	P	C-B	Y	Y	Y	Y	Y
Germany	SurvNet@RKI - 7.3 (1)	C	Co	P	C-B	Y	N	N	N	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy										
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Echinococcosis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N

Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Echinococcosis	V	Co	P	C-B	Y	N	Y	Y	Y

4.13 Giardiasis

Giardia lamblia (*Giardia intestinalis and Giardia duodenalis* are synonyms) is a flagellate, cyst-producing protozoan able to settle in the human and animal bowel as a parasite. Some of them are equally pathogenic to humans and animals such as dogs, cats, cows and sheep. In the environment, major reservoirs of the parasite are contaminated surface waters.

Infected individuals can remain asymptomatic or (three to 25 or more days later) develop either acute or chronic diarrhoea. Bloating, fatigue, and malabsorption of vitamins and fats ensue. Infants and children are at a particularly increased risk of infection.

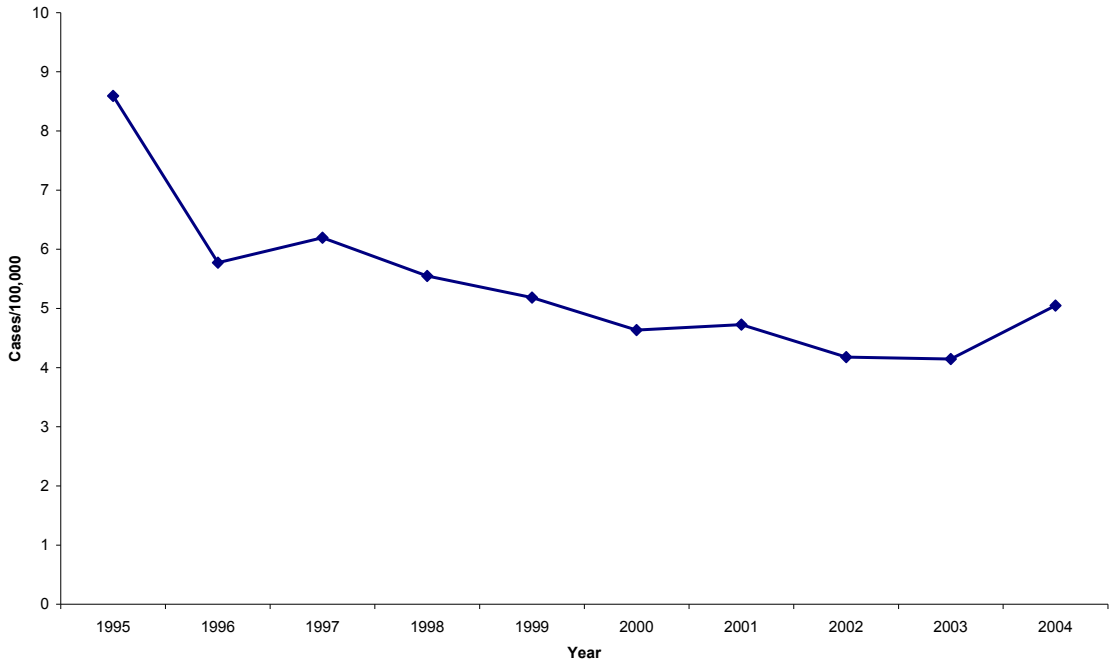
A major pathway of disease transmission is personal contact with infected patients or exposure to food or water contaminated by them. Thus, individuals in nursing homes or day-care centres are particularly susceptible to outbreaks.

Giardia cysts can survive for extended periods of time in the environment and chlorination of water alone cannot inactivate them. Therefore, cases among hikers or backpackers in wilderness areas are common, and waterborne outbreaks due to inadequate treatment of drinking water are common.

10-year trends

As for many diseases, large differences between surveillance systems make comparisons between countries very difficult. Although only 11 countries reported for the whole period while Austria, Cyprus, Denmark, France, Greece, Luxembourg, Netherlands, Portugal and Liechtenstein did not submit any reports for any of the years. The available data suggests a relatively stable trend over the last few years (figure 4.13.1). The annual incidence remains at around 5.0 per 100 000.

Figure 4.13.1. Incidence rate of giardiasis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat and country reports. Data missing from Austria, Cyprus, Denmark, France, Greece, Luxembourg, Netherlands, Portugal and Liechtenstein.

The situation in 2005

In 2005, some 15 103 cases were reported by 18 countries. Estonia (24.28 per 100 000), followed by Iceland (14.65 per 100 000) reported the highest incidence rates (table 4.13.1). The information on the surveillance systems shows a wide mix of voluntary, sentinel systems, and compulsory or comprehensive ones. In several other countries (e.g. Austria) giardiasis is not a notifiable disease. Giardiasis is one of the diseases for which it is especially difficult to compare different countries' surveillance data. The data suggest the overall incidence rate was 5.24 per 100 000.

Table 4.13.1. Number of giardiasis cases in the EU and EEA/EFTA, 2005

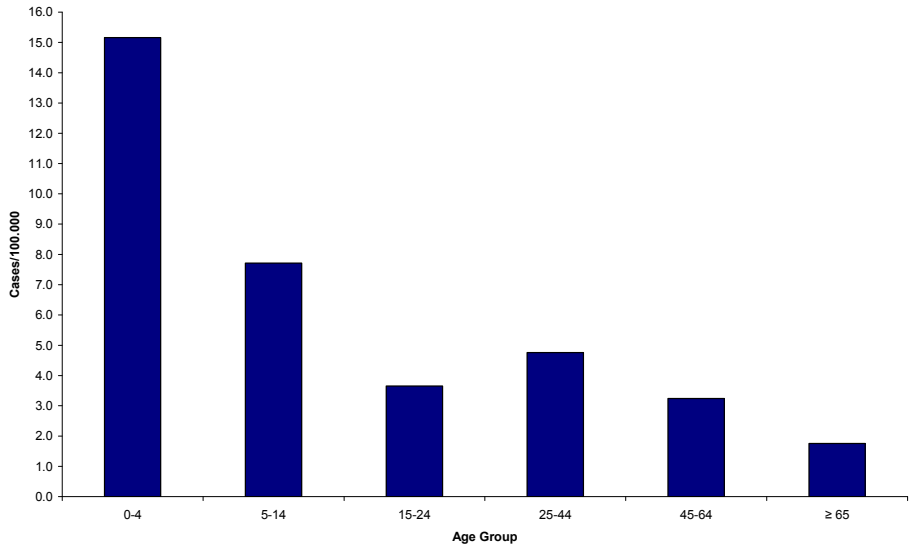
Country	Report type*	Reported cases	Incidence /100 000
Austria	—	—	—
Belgium	C	1 435	13.74
Cyprus	C	1	0.13
Czech Republic	—	92	0.90
Denmark	—	—	—
Estonia	A	327	24.28
Finland	—	—	—
France	—	—	—
Germany	C	4 367	5.29
Greece	—	—	—
Hungary	C	26	0.26
Ireland	C	57	1.39
Italy	—	—	—
Latvia	C	9	0.39
Lithuania	C	44	1.28
Luxembourg	—	—	—
Malta	C	1	0.25
Netherlands	—	—	—
Poland	C	3 258	8.53
Portugal	—	—	—
Slovakia	C	70	1.30
Slovenia	C	23	1.15
Spain	C	561	1.30
Sweden	C	1 151	12.77
United Kingdom	C	3 215	5.36
EU total		**14 637**	**5.17**
Iceland	C	43	14.65
Liechtenstein	—	—	—
Norway	C	423	9.18
Total		**15 103**	**5.24**

Source: Country reports. *A: Aggregated report; C: Case-based report; 0: No case reported; —: No report.

Age and sex distribution

The age distribution for the 8 374 cases of giardiasis for which data on age groups were included (figure 4.13.2) shows the highest incidence in the 0–4 year-olds (15.2 per 100 000). More cases were reported in men (3.1 per 100 000) than women (2.6 per 100 000), for every country reporting demographic information of their giardiasis cases.

Figure 4.13.2. Age-specific incidence distribution of giardiasis cases for selected European countries, 2005 (n = 8 374)

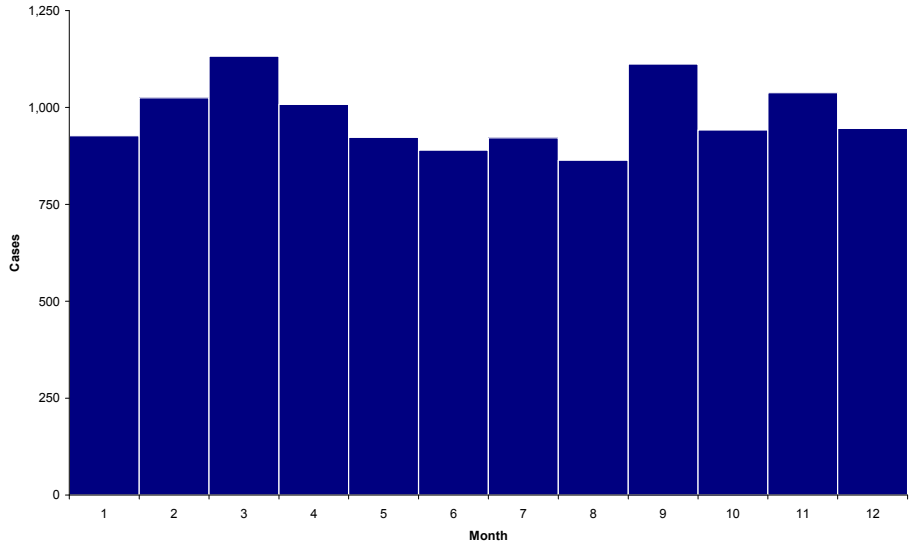


Source: Country reports. Reports with age-specific data were available from: Belgium, Cyprus, Czech Republic, Estonia, Germany, Hungary, Ireland, Latvia, Malta, Slovakia, Spain, Sweden, Iceland and Norway.

Seasonality

Giardiasis illustrates a mild bi-phasic seasonality with peaks in spring (March) and in autumn (September) (figure 4.13.3). This seasonality is particularly pronounced in Germany but is also observed in other countries. A considerable fraction of cases are probably imported from people returning from travel abroad (the main factor in the seasonal trends). However, no data from the countries on this aspect were available.

Figure 4.13.3. Distribution of giardiasis cases by month, for selected European countries, 2005



Source: Country reports. Reports with seasonal data were available from: Belgium, Cyprus, Estonia, Germany, Hungary, Ireland, Latvia, Malta, Poland, Slovakia, Spain, Sweden, Iceland and Norway.

Imported cases

Since inter-country comparison for giardiasis is difficult due to differences in health care access, detection, and reporting, cases of giardiasis reported in Sweden by travellers returning from abroad were used to assess the overall risk of infection throughout Europe[2]. The majority of cases were imported from Turkey, followed by countries of the former Yugoslavia, Russia and Spain. With the Swedish Travel and Tourist Database the total number of travellers was quantified for each country in order to calculate the incidence per 100 000 travellers. The risk varied by a factor of 100 between European countries and was largest in Russia, followed by Romania, Turkey, the former Yugoslavia, and Bulgaria.

Conclusions

- The overall surveillance systems for giardiasis need to be strengthened considerably to enable better analysis of the data at European level.
- A large fraction of cases are probably imported from people returning from travel abroad, as shown by the seasonal trends.

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria										
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	Obligatory, countrywide, based on a double system of reporting HBV, Giardiasis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y

France										
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy										
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Giardiasis	O	Co	P	C-B	Y	N	Y	Y	Y

4.14 Gonorrhoea

Gonorrhoea is a sexually transmitted infection (STI) caused by *Neisseria gonorrhoeae* bacteria. Urethral infections in men and uro-genital infections in women are the main presenting feature, but a broad spectrum of clinical presentations can occur, including systemic dissemination with fever and cutaneous and articular involvement. Pharyngeal and ano-rectal infections also occur.

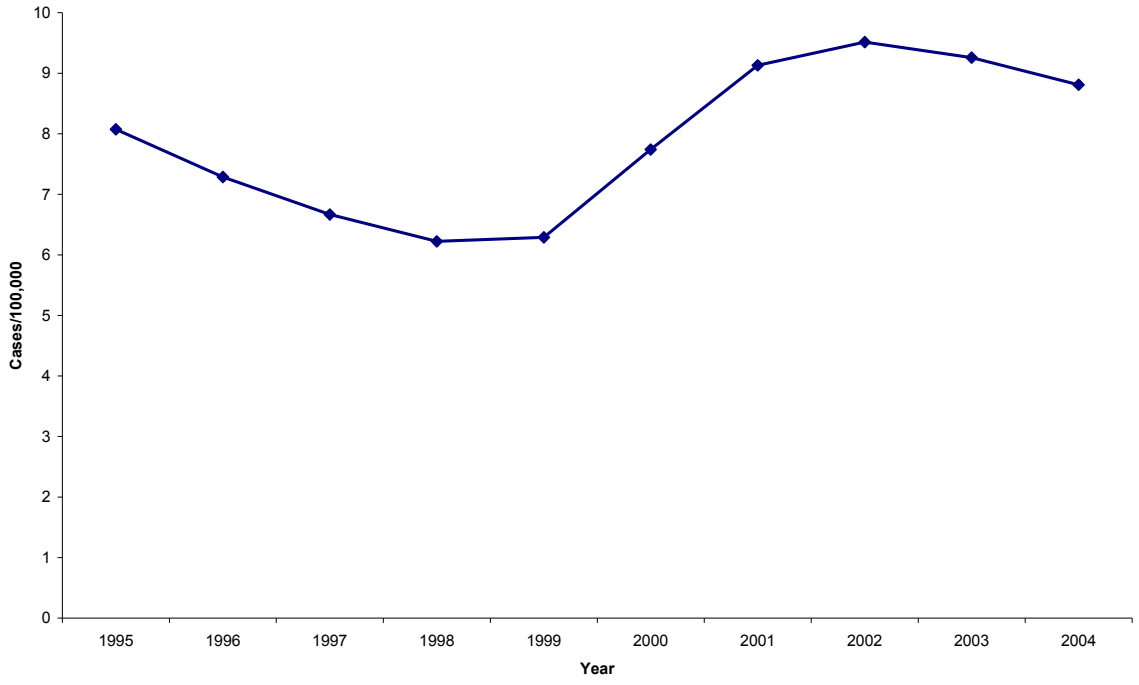
Urethral symptoms and vaginal discharge may appear after a short incubation (2–7 days following exposure), but in women cervicitis may remain asymptomatic. Once a diagnosis is made, uncomplicated gonorrhoea is usually cured by a single dose of a suitable antibiotic. Partner notification and treatment is essential to curtail transmission.

10-year trends

All the EU countries, Norway and Iceland provided data for the whole of this period, apart from five that reported for only some of the years. In the last 10 years, the Baltic States (Estonia, Latvia and Lithuania) saw a steady decrease from levels of up to 200 cases per 100 000 in 1995, to below 40 per 100 000 in 2004. In the low-incidence countries in central Europe (Slovakia, Poland and Hungary) gonorrhoea incidences declined steadily to very low levels in 2001–03. In the southern European countries, gonorrhoea has been decreasing since 1995, while in the UK, Belgium and Sweden the incidence appeared to decline during 1996–97 (and Norway in 1998), but has risen steadily since then.

The overall incidence trend appeared to decline for the first part of the decade but has since risen to a high of 9.5 per 100 000 in 2002 and has remained stable ever since.

Figure 4.14.1. Incidence rate of gonorrhoea cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The situation in 2005

In 2005, a total of 27 537 cases were reported by 22 countries. The highest incidence rate was observed in the United Kingdom (33.98 per 100 000), followed by Latvia (30.09 per 100 000) and the lowest in Luxembourg (0.22 per 100 000), followed by Spain and Portugal (both with 0.42 per 100 000). However, different surveillance systems operate in these countries making direct comparisons inappropriate. The overall incidence in the reporting countries was 9.5 per 100 000.

Table 4.14.1. Number of gonorrhoea cases in the EU and EEA/EFTA, 2005

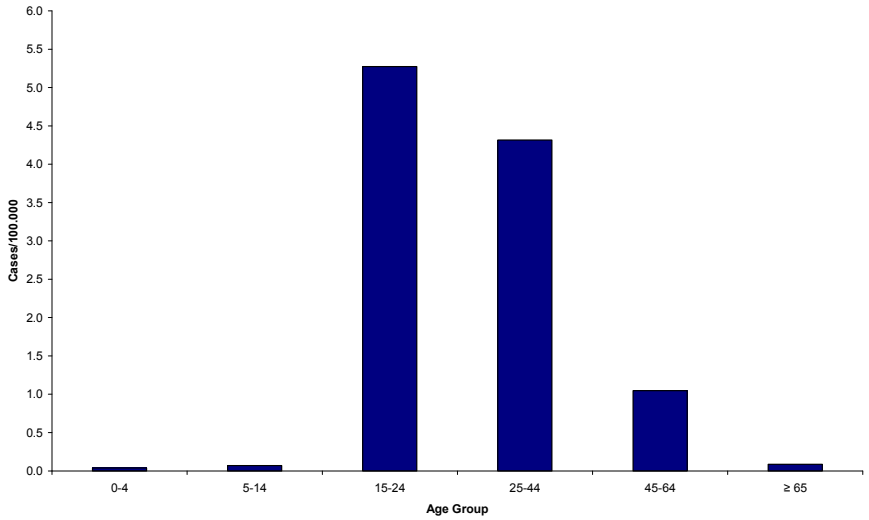
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	658	8.02
Belgium	C	441	4.22
Cyprus	C	16	2.14
Czech Republic	C	858	8.39
Denmark	C	445	8.22
Estonia	A	288	21.38
Finland	C	237	4.53
France	—	—	—
Germany	—	—	—
Greece	—	—	—
Hungary	A	851	8.43
Ireland	—	—	—
Italy	C	427	0.73
Latvia	C	694	30.09
Lithuania	C	433	12.64
Luxembourg	C	1	0.22
Malta	C	23	5.71
Netherlands	—	—	—
Poland	C	399	1.05
Portugal	C	44	0.42
Slovakia	C	109	2.02
Slovenia	C	45	2.25
Spain	C	181	0.42
Sweden	C	691	7.67
United Kingdom	C	20 399	33.98
EU total		**27 240**	**9.56**
Iceland	C	19	6.47
Liechtenstein	—	—	—
Norway	C	278	6.04
Total		**27 537**	**9.50**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

Age and gender distribution

The highest incidence rates were observed in the age groups 15–24 years (5.27 per 100 000) and then the 25–44 year-olds with 4.32 per 100 000 population. Fifteen countries provided information on gender (n = 4 144) and the gonorrhoea incidence rate was 4.5 times higher in men (2.39 per 100 000) than in women (0.53 per 100 000).

Figure 4.14.2. Age-specific incidence distribution of gonorrhoea cases for selected European countries, 2005 (n = 3 449)



Source: Country reports. Reports with age-specific data were available from: Belgium, Denmark, Estonia, Finland, Italy, Latvia, Portugal; while Cyprus Malta Slovakia, Slovenia, Spain, Sweden and Iceland reported zero cases.

Seasonality

As expected, no trends in seasonality were observed in the reported gonorrhoea cases in 2005.

Conclusions

- In eastern European countries, after a sharp increase of incidence of gonorrhoea in the early 1990s, the reported rates of gonorrhoea have declined since 1995. However, these decreases may possibly be due to an increasing trend in underreporting and therefore the recent decreases observed in the region should be interpreted with caution[1].
- Many of the western European countries have experienced a rise in the incidence of gonorrhoea in recent years. In these Member States, young people and men having sex with men were the most affected by the increase[2].
- In 2005, six Member States did not report cases at all. The figures quoted here are undoubtedly an underestimate of the true picture of gonorrhoea epidemiology in Europe.
- The available data for 2005 suggests that young individuals are most at risk of gonorrhoea. Gonorrhoea prevention messages and activities should target, as a priority, this population.

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Surveillance systems overview

Country	System	Compulsory/ Voluntar	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by	National Coverage

						Labs	Physicians	Hospitals	Others	
Austria	GESCHLECHTSKRANKHEITENGESETZ (STD-law) 1945	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	Register of STD	C	Co	P	C-B	Y	Y	Y	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Denmark	STI clinical	C	Co	P	C-B	N	Y	N	N	Y
Denmark	Clincial STI system	C	Co	P	C-B	N	Y	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Gonococc	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
Finland	STD sentinel surveillance	V	Se	P	C-B	N	Y	N	N	N
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Renago: surveillance of gonococal infection	V	Se	P	C-B	Y	N	Y	Y	Y
France	Sexually transmitted infection	V	Se	A	C-B	Y	Y	Y	Y	N
Germany										
Greece										
Hungary	STD surveillance	C	Se	P	A	N	Y	N	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	STI surveillance	C	Co	P	A	Y	N	Y	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	STI and skin infections surveillance system	C	Co	P	C-B	N	Y	Y	N	Y

Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	STI sentinel surveillance network	V	Se	P	C-B	N	Y	N	N	N
Norway	MSIS (group B diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Gonococcal Infections Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SPOSUR	C	Co	P	C-B	N	Y	N	N	Y
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Gonococcal infections	V	Ot	A	C-B	Y	Y	Y	Y	Y

4.15 Haemophilus influenzae

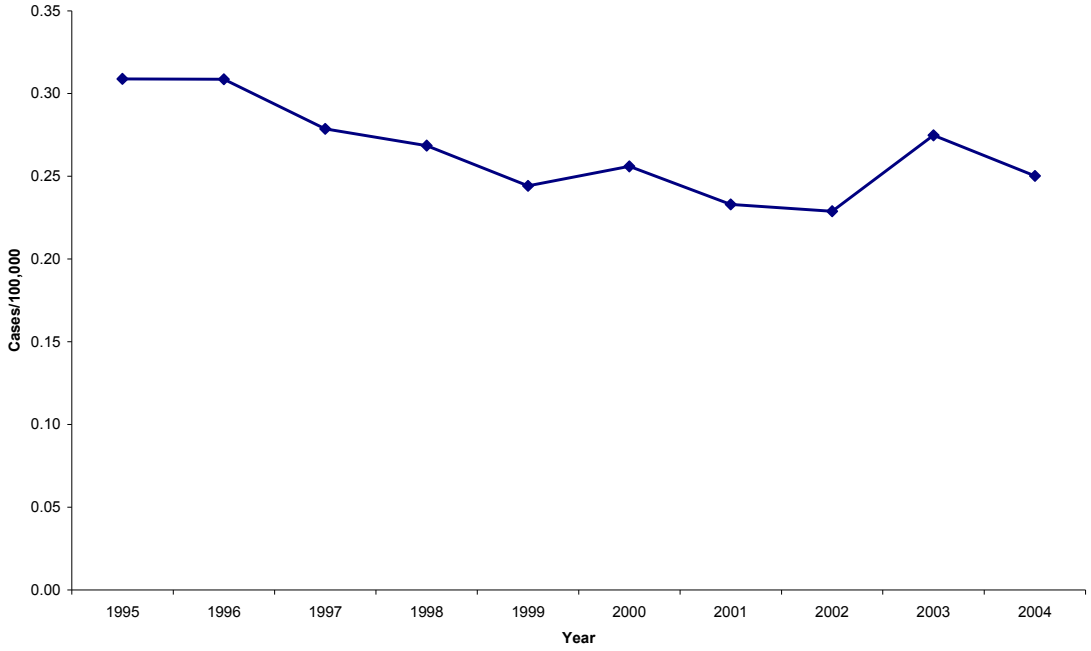
Haemophilus influenzae, a gram negative coccobacillus, is divided into unencapsulated (non-typable) and encapsulated strains. The latter are further classified into serotypes, with the *Haemophilus influenzae* serotype b being the most pathogenic for humans, responsible for respiratory infections, ocular infection, sepsis and meningitis.

Haemophilus influenzae serotype b (Hib) is the most common cause of bacterial meningitis in children aged two months to five years, in those countries where suitable vaccination programmes are not in place. Children start showing symptoms of meningitis after a probable incubation period of about 2–4 days and clinical manifestations tend to evolve rapidly. Even with adequate and prompt antibiotic treatment, mortality can reach up to 10% of cases. Vaccine prophilaxis is therefore of paramount importance, in order to protect children.

10-year trends

Data were available from only 12 Member States, Iceland and Norway for the whole period, while a further 12 countries submitted reports for only some of the years. The data are tainted by the fact that in the earlier years some countries reported on all *Haemophilus influenzae* infections, rather than just serotype b, as was done by other countries. However, the available data still show a clear overall declining trend in Europe (most markedly in 1996–2001) and this is most likely due to effective vaccination programmes against invasive Hib infection[1]. Several countries had a stable incidence rate over the past five years, but a slow increase was observed in the Netherlands, Ireland and the UK.

Figure 4.15.1. Incidence rate of invasive *Haemophilus influenzae* type b cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Cyprus and Liechtenstein.

Situation in 2005

In 2005, 1 145 cases were reported by 25 countries. Estonia reported the highest incidence rate, with 1.48 per 100 000, followed by Sweden (1.31 per 100 000). Hib vaccination is now included in all immunisation schedules in the EU countries except in Poland. The overall incidence in the EU was 0.26 per 100 000.

Table 4.15.1. Number of invasive *Haemophilus influenzae* type b cases in the EU and EEA/EFTA, 2005

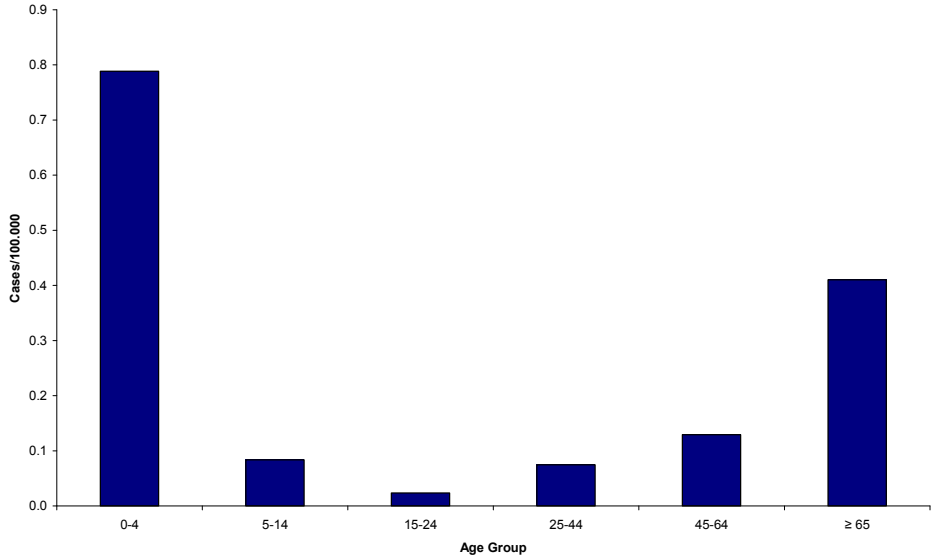
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	6	0.07
Belgium	C	76	0.73
Cyprus	C	0	0.00
Czech Republic	C	20	0.20
Denmark	C	5	0.09
Estonia	C	20	1.48
Finland	—	—	—
France	C	517	0.83
Germany	C	67	0.08
Greece	A	2	0.02
Hungary	C	2	0.02
Ireland	C	18	0.44
Italy	C	30	0.05
Latvia	C	0	0.00
Lithuania	C	22	0.64
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands	—	—	—
Poland	C	70	0.18
Portugal	C	12	0.11
Slovakia	C	7	0.13
Slovenia	C	6	0.30
Spain	C	7	0.02
Sweden	C	118	1.31
United Kingdom	C	135	0.22
EU total		**1 140**	**0.26**
Iceland	C	0	0.00
Liechtenstein	—	—	—
Norway	C	5	0.11
Total		**1 145**	**0.26**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

Age and gender distribution

The highest incidence rate was reported in the age group 0–4 years with 0.79 per 100 000, representing 22% of all cases. The incidence was very low between five and 65 years, but increased sharply after 65 years of age (0.41 per 100 000).

Figure 4.15.2. Age-specific incidence distribution of invasive *Haemophilus influenzae* type b cases for selected European countries, 2005 (n = 359)



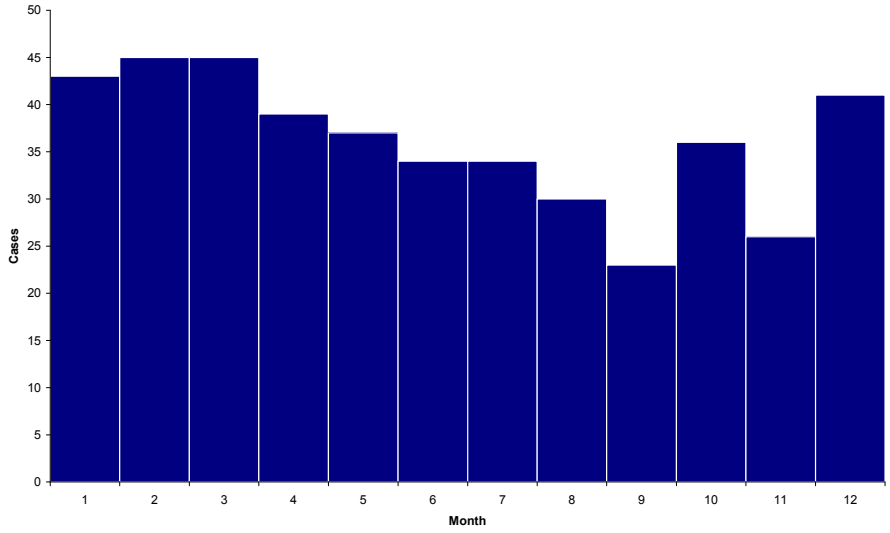
Source: Country reports. Reports with age-specific data were available from: Austria, Belgium, Czech Republic, Denmark, Estonia, Germany, Hungary, Ireland, Portugal, Slovakia, Spain, Sweden, Iceland and Norway; while Latvia, Cyprus, Luxembourg, Malta and Iceland reported zero cases.

Amongst the confirmed cases with information on gender, there was no real difference between infections in males (n = 186) and in females (n = 177).

Seasonality

There was no particular seasonal trend in 2005, although, as expected the number of cases in the winter period was slightly higher than during the rest of the year.

Figure 4.15.3. Distribution of invasive *Haemophilus influenzae* type b cases by month, for selected European countries, 2005 (n=433)



Source: Country reports. Reports with seasonal data were available from: Austria, Belgium, Czech Republic, Denmark, Estonia, Germany, Hungary, Ireland, Poland, Portugal, Slovakia, Spain, Sweden and Norway; while Latvia, Cyprus, Luxembourg, Malta and Iceland reported zero cases.

Conclusions

- It is difficult to comment on any general trends due to the lack of adequate data available for this time period and because of the wide variety in the surveillance systems. In general a clear decrease in the overall number of reported cases has been observed from 2000 onwards, possibly due to improved vaccination coverage. Hib vaccination, whether or not in combination with other vaccines, is now included in all EU countries' schedules with the exception of Poland (and Romania and Bulgaria)[2].

- The report published by the EU-IBIS network on 2002 Hib cases[3] also suggests that the incidence of Hib infection in EU countries has dramatically decreased after vaccine introduction. The highest incidence rates have been observed in Ireland and UK in 2002 in children under five years of age, and this was probably due to the absence of a booster dose in the vaccination schedule. Both UK and Ireland have since introduced a booster dose at 12 months of age. Due to continuing changes in vaccination schedules and use of different products (combined or not, using different adjuvants, etc.) across Europe, continued observation is essential. Furthermore, pooling data at an EU level may help to ensure that changes in the effectiveness of vaccination programmes can be detected at the earliest possible stage, especially for smaller countries.

References

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Czech	Active surveillance of	C	Co	A	C-B	Y	Y	Y	N	Y

Republic	invasive Hib disease									
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Hib	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	Hib and meningococcal surveillance	C	Co	P	C-B	Y	Y	N	N	Y
Italy	National surveillance system of bacterial meningitis	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	bacterial meningitis/septicaemia	V	Co	P	C-B	Y	N	N	N	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Haemophilus Influenzae Surveillance System	C	Co	P	C-B	N	Y	N	N	Y

Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Infection with Haemophilus influenzae type b	O	Co	P	C-B	Y	N	Y	Y	Y

4.16 Hepatitis A

Hepatitis A is caused by the hepatitis A virus (HAV), a small RNA virus member of the *Picornaviridae* family. Up to 90% of HAV infections in children are asymptomatic or anicteric. Icteric cases, more common in adults, present with jaundice and general symptoms (fever, loss of appetite, nausea, vomiting, etc.) which may last for several weeks. About 15% of patients have prolonged or relapsing symptoms over a 6–9-month period. No specific treatment is available, and patients recover spontaneously.

Humans are the only reservoir of HAV, which is transmitted by the faecal-oral route, either by person-to-person contact or by ingestion of contaminated food or water. Recently, however, sexual transmission among men who have sex with men has been described. The incubation period of symptomatic cases ranges between two and seven weeks. Patients are infectious from two weeks before the onset of symptoms and may continue to be infectious for one week or more after.

Hepatitis A occurs worldwide. Transmission can be reduced especially by improving hygiene in food production handling. An inactivated anti-HAV vaccine is available both for pre- and post-exposure prophylaxis.

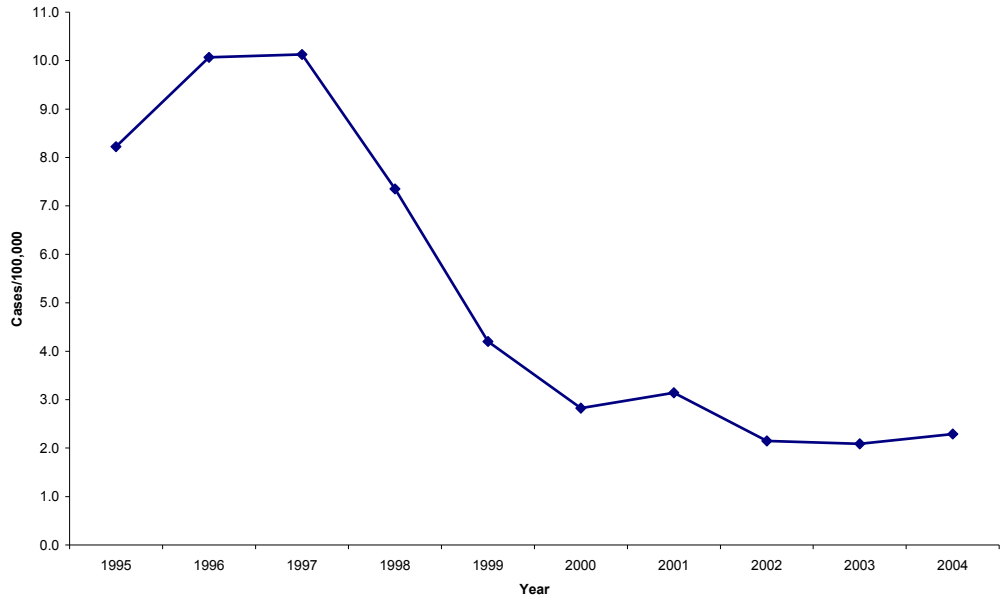
10-year trends

Data on hepatitis A incidence are available for the whole period 1995 to 2004 from 21 EU Member States and two EEA/EFTA countries (Iceland and Norway), while four Member States submitted data for some of the years.

Almost 210 000 cases have been reported in Europe between 1995 and 2004, and during this period a steady decrease was observed from a high in 1996–97. Complete data were available from all but two countries.

The overall trend of the incidence shows a two-year peak in 1996–97 (more than 10 cases per 100 000) and then a steady decline until 2004 (figure 4.16.1). Since 2000, the overall annual incidence has remained at under four cases per 100 000 population.

Figure 4.16.1. Incidence rate of hepatitis A cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

There are important differences in endemicity between the EU countries. A few countries (Estonia, Latvia, Lithuania and Slovakia) reported an incidence of more than 10 per 100 000 population, while peaks of incidence of more than 50 per 100 000 have been reported in Estonia, Latvia and Lithuania in several years. A second group of countries (Czech Republic, Finland, Hungary, Italy, Ireland and Norway) shows a lower incidence, with an average incidence of between five and ten cases per 100 000 for the overall period. The remaining countries show a stable trend on a much lower level over the whole period.

The situation in 2005

In 2005, 6 695 cases were reported by 25 countries. Slovakia (9.81 per 100 000) and Latvia (6.29 per 100 000) are the only countries with incidences of more than five per 100 000.

The remaining countries reported incidence values of 3 per 100 000 or less, corresponding well with the levels in the preceding years. The overall incidence rate was 1.66 per 100 000.

Table 4.16.1. Number of hepatitis A cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	161	1.96
Belgium	C	243	2.33
Cyprus	C	9	1.20
Czech Republic	C	322	3.15
Denmark	C	48	0.89
Estonia	A	18	1.34
Finland	C	26	0.50
France	—	—	—
Germany	C	1 170	1.42
Greece	C	159	1.44
Hungary	C	279	2.76
Ireland**	C	50	1.22
Italy	C	1 265	2.16
Latvia	C	145	6.29
Lithuania	C	74	2.16
Luxembourg	—	—	—
Malta	C	6	1.49
Netherlands	C	214	1.31
Poland	C	52	0.14
Portugal	C	246	2.34
Slovakia	C	528	9.81
Slovenia	C	10	0.50
Spain	C	1 061	2.47
Sweden	C	93	1.03
United Kingdom	C	458	0.76
EU total		**6 637**	**1.67**
Iceland	C	1	0.34
Liechtenstein	—	—	—
Norway	C	57	1.24
Total		**6 695**	**1.66**

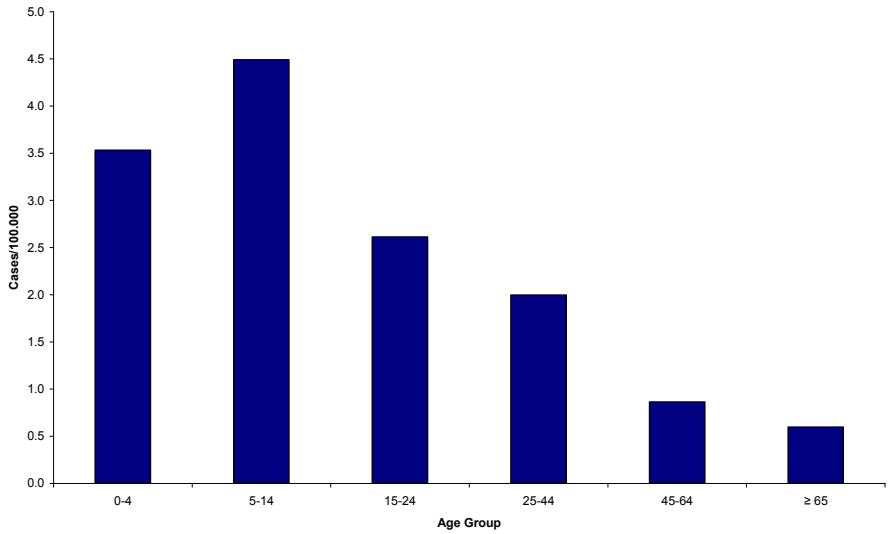
Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

**The Irish case definition includes cases classified as possible, which are not included in the old BSN reports but are included in the Irish Annual Report.

Age and gender distribution

The age distribution of hepatitis A cases shows that the highest incidence rates are in the younger age groups, namely the 5–14 (4.49 per 100 000) and 0–4 year-olds (3.53 per 100 000) (figure 4.16.2). No significant differences between women (1.2 per 100 000) and men (1.6 per 100 000) were evident.

Figure 4.16.2. Age-specific incidence distribution of hepatitis A cases for selected European countries, 2005 (n = 5 628)

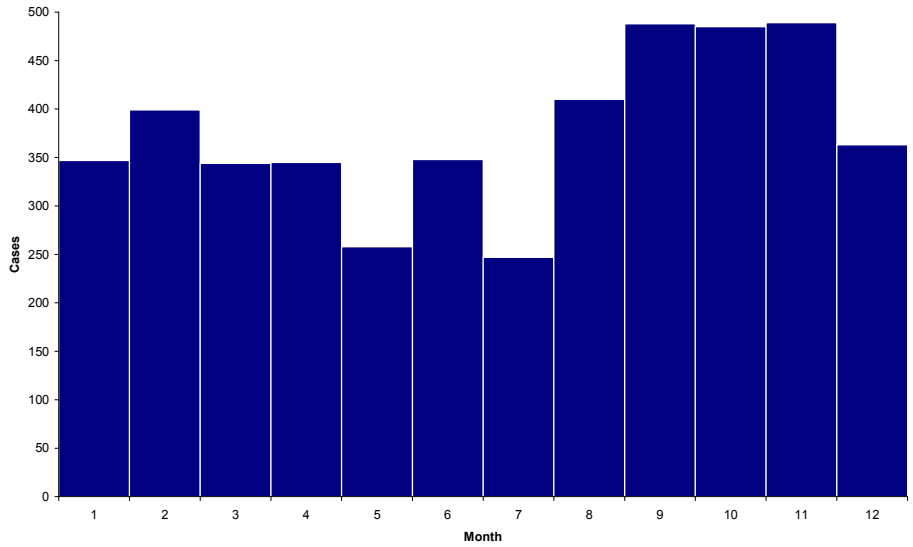


Source: Country reports. Reports with age-specific data were available from: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, Netherlands, Portugal, Slovakia, Spain, Sweden, Iceland and Norway.

Seasonality

A peak in the number of reported cases is evident in the late summer and autumn months. A lesser peak can be also seen in February (figure 4.16.3).

Figure 4.16.3. Distribution of hepatitis A cases by month, for selected European countries, 2005 (n = 4 523)



Source: Country reports. Reports with seasonal data were available from: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Iceland and Norway.

Imported cases

The majority of reported cases were domestically acquired. Only nine countries reported a few cases that were believed to have been acquired abroad, but the overall proportion was very low (3%).

Conclusions

- Over the last 10 years hepatitis A showed a steadily decreasing trend in most EU countries.
- Strong differences in endemicity still exist, and important peaks of incidence have been registered. At present, hepatitis A is still endemic and a recurrence of large outbreaks is possible in some EU countries.
- In most EU Member States, the lower incidence of hepatitis A has led to an increase in susceptibility of young people. This, together with increasing contacts with people coming from HAV-endemic areas, could modify the usual epidemiological patterns of such diseases, introducing new modes of transmission and new risk-groups. For example, outbreaks of hepatitis A have been described in recent years in MSM in Europe[1,2,3,4,5]. Furthermore, low endemicity could increase the risk of infection for those patients with chronic hepatitis or cirrhosis who lack naturally acquired immunity to HAV[6].
- The availability of HAV vaccines offers new prevention opportunities. Likewise in post-exposure prophylaxis and outbreak contro[7,8].
- Recent evidence supporting the efficacy of HAV vaccination in regions of intermediate endemicity suggests the need to reconsider the current recommendations for vaccine use in such countries or areas[9,10].

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y

Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting HAV	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Sentinelles	V	Se	A	C-B	N	Y	N	N	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y

Portugal	Hepatitis A Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Hepatitis A	O	Co	P	C-B	Y	N	Y	N	Y

4.17 Hepatitis B

Hepatitis B is caused by hepatitis B virus (HBV), a DNA virus, member of the *Hepadnaviridae* family. HBV infection can be either asymptomatic or symptomatic, acute or chronic and is known to have a long incubation period of up to six months (or even longer). Acute illness ranges from a mild to a fulminant disease. HBV infection in children is usually asymptomatic, with an higher tendency to become chronic. Conversely, the case fatality rate of acute infection can reach 2% in the elderly.

Those who become chronically infected by HBV (from >30% among children to <5% among adults) are at a higher risk of serious consequences: liver cirrhosis (25%) and cancer (5%). Moreover, they act as a reservoir for continuing HBV transmission. In recent years, increasing numbers of drugs are becoming available to counter chronic infection.

HBV is transmitted by percutaneous or mucosal contact with blood or other body fluids (serum, semen, saliva) from infected patients. Chronic carriers usually remain infectious throughout their life. After infection, the incubation period ranges from one to seven months[1].

For infants and children, the main source of infection is perinatal transmission from infected mothers and horizontal transmission from infected members in the household. Adolescents and adults normally become infected through unprotected sexual activity or as a consequence of injecting drug users sharing contaminated needles. Transmission via blood transfusion or through the use of plasma-derived products is now rare.

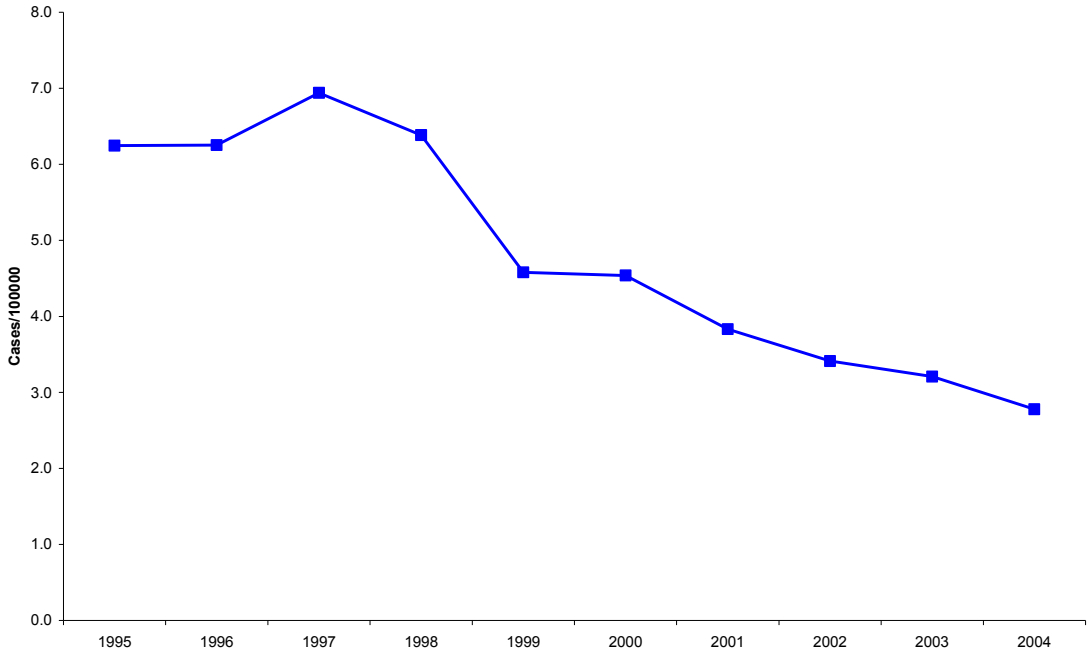
Hepatitis B occurs worldwide with a very high burden of disease (an estimated 280 million carriers worldwide). HBV vaccination is currently the most effective way to prevent HBV infection.

10-year trends

Data on hepatitis B incidence are available for the period 1995 to 2004 for all 25 EU Member States and two EEA/EFTA countries (Iceland and Norway). There is no solution to the problem of how the countries distinguish between reports on chronic and acute cases of Hepatitis B, even though all agree that only acute cases are notifiable. More than 200 000 cases were reported during this time. Complete data patterns were available from all but France (data only available for 1996–98), Spain (data missing for 1995 and 1996), Luxembourg (data missing for 2002) and Liechtenstein (no data).

The overall incidence trend shows a steady decline from 6.2 to 2.8 cases per 100 000 people over this period (figure 4.17.1).

Figure 4.17.1. Incidence rate of hepatitis B cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Irish cases are not included in this graph as notification figures for hepatitis B prior to 2004 did not distinguish between acute and chronic cases. Data from UK also excluded because the surveillance system does not differentiate between acute and chronic infections. Data from the Netherlands excluded because in 1999 the reporting system was changed to include both acute and chronic HBV infections, so a significant increase in 1999 was due to the inclusion of the chronic infections.

Notwithstanding this clear trend, the situation is not homogeneous in EU countries and different patterns in the disease trend can be distinguished. Austria and Belgium appear to have a rising trend. In a minority of countries, accounting for less than 2% of the EU population, incidence levels were significantly higher than average and several peaks can be detected (Estonia, Iceland, Latvia, Lithuania and Luxembourg, although the latter two countries have dropped into the low incidence category over the last few years).

The situation in 2005

Of the 6 977 cases reported in 2005 by 26 countries, the highest incidence rates were reported by Iceland (11.24 per 100 000), followed by Latvia (7.37 per 100 000). The overall incidence was estimated at 1.51 per 100 000.

Table 4.17.1. Number of hepatitis B cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	575	7.01
Belgium	—	554	5.30
Cyprus	C	6	0.80
Czech Republic	—	361	3.53
Denmark	—	28	0.52
Estonia	A	78	5.79
Finland	—	—	—
France	C	142	0.23
Germany	C	1 173	1.42
Greece	C	85	0.77
Hungary	C	119	1.18
Ireland ([a])	C	74	1.80
Italy	C	1 030	1.76
Latvia	C	170	7.37
Lithuania	C	141	4.12
Luxembourg	C	5	1.10
Malta	C	12	2.98
Netherlands ([b])	C	285	1.75
Poland	C	444	1.16
Portugal	C	89	0.85
Slovakia	C	124	2.30
Slovenia	C	17	0.85
Spain	C	625	1.45
Sweden	C	217	2.41
United Kingdom ([b])	C	444	0.74
EU total		**6 798**	**1.49**
Iceland ([b])	C	33	11.24
Liechtenstein	—	—	—
Norway	C	146	3.17
Total		**6 977**	**1.51**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

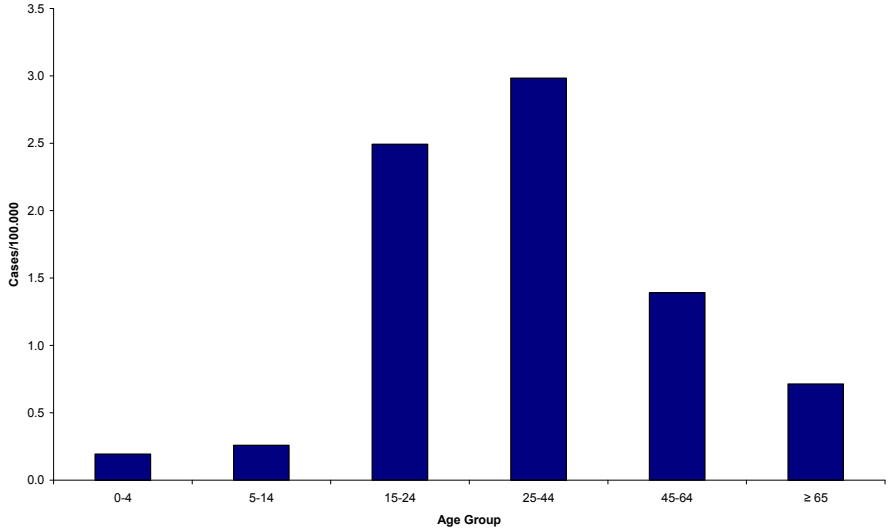
(a) For Ireland, acute and chronic cases of Hepatitis B are notifiable. Only cases reported as acute are included in the country reports.

(b) Data from UK, the Netherlands and Iceland do not differentiate between acute and chronic infections. For Iceland many of the cases reported are believed to be in immigrants with a chronic infection who acquired their infection before coming to Iceland.

Age and gender distribution

The highest incidences of hepatitis B are reported in the age group 25–44 years (2.98 per 100 000) (figure 4.17.2), followed by the 15–24 year-olds (2.49 per 100 000). The rate in males (1.33 per 100 000) was 2.3 times that in women (0.58 per 100 000).

Figure 4.17.2. Age-specific incidence distribution of hepatitis B cases for selected European countries, 2005 (n = 4 856)



Source: Country reports. Reports with age-specific data were available from: Austria, Cyprus, Czech Republic, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, Netherlands, Portugal, Slovakia, Spain, Sweden and Norway.

Seasonality

As expected there were no seasonal trends observed for hepatitis B.

Conclusions

- During the last 10 years, the incidence of hepatitis B in the EU showed a steadily decreasing trend. Nevertheless, strong differences in incidence still exist between EU countries, and in some countries there is even an upward trend, suggesting the current preventive measures may need to be reviewed.
- The availability of HBV vaccines that are safe and effective for universal vaccination, requires a thorough analysis and evaluation to determine distribution patterns and risk groups in the EU.
- Hepatitis B is increasingly being considered as a sexually transmitted disease. However, there is evidence that common practices (tattooing, beauty treatments, etc.) are still important in transmitting HBV infection[2,3,4].

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting HBV, Giardiasis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Sentinelles	V	Se	A	C-B	N	Y	N	N	Y
France	Surveillance of viral blood borne infections in blood donors	O	Co	A	C-B	N	N	N	Y	Y
France	HIV, HCV and HBV testing in unlinked anonymous testing sites	C	Co	P	A	N	N	N	Y	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific	C	Co	P	C-B	Y	Y	Y	N	Y

	surveillance									
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	hepatitis B surveillance	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Netherlands	STI sentinel surveillance network	V	Se	P	C-B	N	Y	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Hepatitis B Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Hepatitis B	O	Co	P	C-B	Y	N	Y	N	Y

4.18 Hepatitis C

Hepatitis C is caused by the hepatitis C virus (HCV), an RNA virus member of the *Flaviviridae* family that was discovered in 1989. Currently, six distinct HCV genotypes and more than 100 subtypes are known, with virus variants emerging continually (making vaccine design very difficult).

Humans are the only reservoir of HCV. The infection is mainly acquired through percutaneous contact with infectious blood (often through sharing contaminated equipment among injecting drug users). The risk of perinatal transmission is around 3–5%, but in cases of HIV co-infection it may reach 15%. Sexual transmission seems to be infrequent. After 1991, blood transfusions and plasma-derived products became much safer than before, as routine HCV tests started to become widely available.

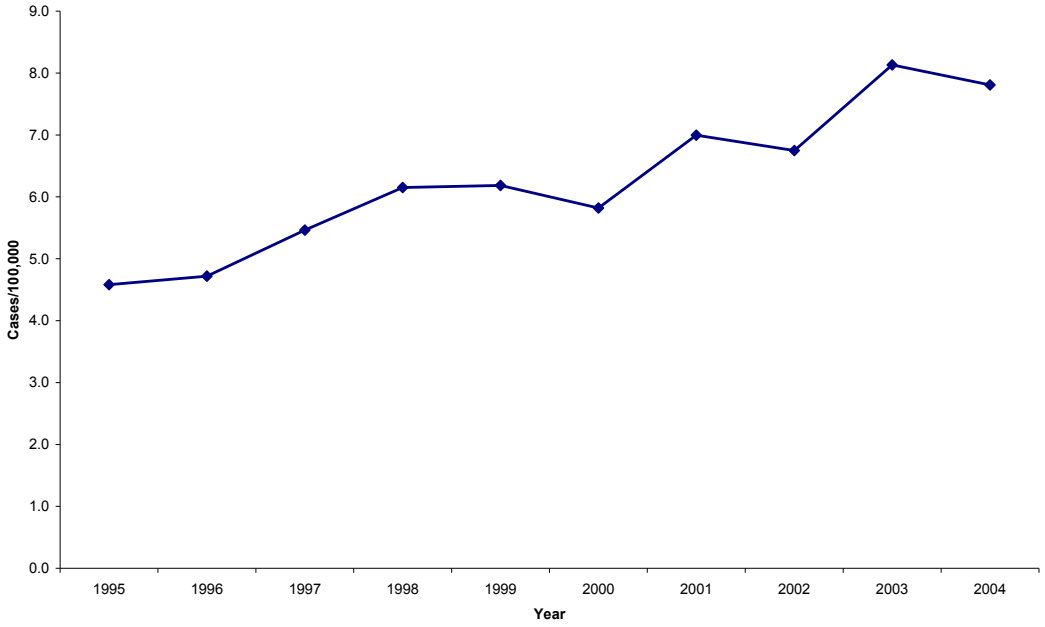
After exposure, the incubation period averages 6–9 weeks (with a range between two and 24 weeks). In contrast with other forms of viral hepatitis, up to 90% of patients infected by HCV do not go through an acute phase of disease. A significant proportion become chronically infected, and are known to be at a higher risk of developing, over time, liver cirrhosis (20%) and cancer (1–5%). In recent years, growing numbers of drugs are becoming available to deal with chronic HCV infection.

No HCV vaccination is yet available. The morbidity of HCV disease is high, with up to 170 million people estimated to have had contact with the virus and 130 million people chronically infected worldwide. HCV is considered to be the leading cause of liver cancer and liver transplants in Europe and the USA. The most effective preventive measures are screening and testing of blood and organ donors, virus-inactivating processing of plasma-derived products, good infection control and safe injection practices in healthcare settings.

10-year trends

Data on hepatitis C incidence are available at lease some of the years for the period 1995 to 2004 from all 25 EU Member States (except for France), Iceland and Norway, although complete data for the whole period are available only from 15 countries (Austria, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Latvia, Lithuania, Portugal, Slovenia, Spain, Sweden, United Kingdom and Iceland). 215 647 cases have been reported during the whole period. After a relatively stable period during 1995–2000, the incidence in Europe has increased steadily from 7.0 per 100 000 in 2001, to 7.8 per 100 000 in 2004, (figure 4.18.1), but this increase may possibly be an artefact of the surveillance data. Due to the nature of the disease (many chronic, asymptomatic infections) and the relatively recent inclusion of HCV infection in the number of diseases under surveillance at national level, the currently available data do not permit a true picture of the acute HCV infection trend in EU countries.

Figure 4.18.1. Incidence rate of hepatitis C cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from France and Liechtenstein.

The situation in 2005

In 2005, more than 29 000 hepatitis C cases were reported by 24 countries. The highest incidence rates per 100 000 (of newly reported cases) were reported by Ireland (34.99), Sweden (28.96), and United Kingdom (17.54). However, due to the nature of the disease (mainly chronic, asymptomatic infections) and the relatively recent introduction of HCV infection to the list of diseases under surveillance at national level, the currently available data do not permit any comparisons between countries in Europe. Some countries, for example Sweden or Austria, report a high number of cases due to the inclusion of chronic infections, while others, like Norway, only report cases with evidence of acute clinical hepatitis. The overall incidence rate of newly diagnosed cases was 8.6 per 100 000.

Table 4.18.1. Number of hepatitis C cases in the EU and EEA/EFTA, 2005

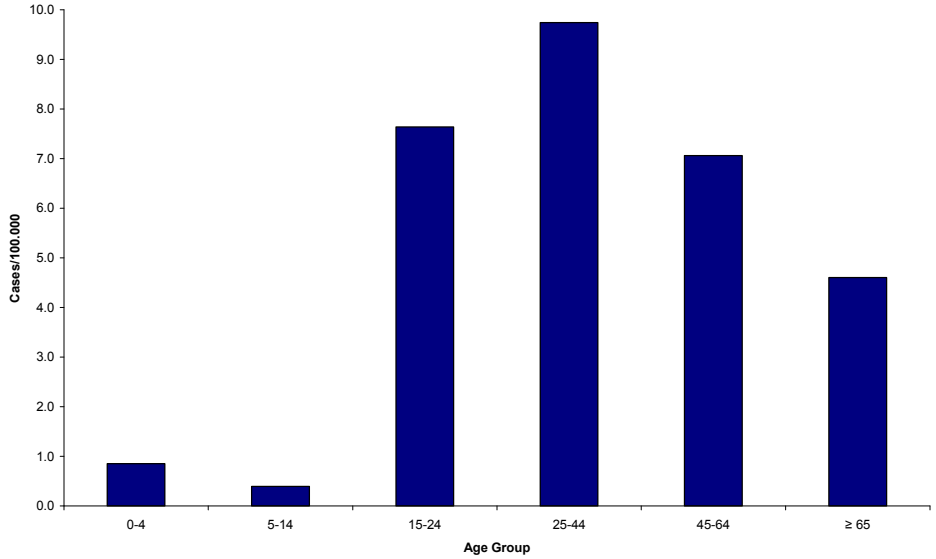
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	894	10.89
Belgium	C	927	8.87
Cyprus	C	4	0.53
Czech Republic	C	844	8.26
Denmark	C	307	5.67
Estonia	A	81	6.01
Finland	—	—	—
France	—	—	—
Germany	C	7 867	9.54
Greece	C	13	0.12
Hungary	C	22	0.22
Ireland	C	1 438	34.99
Italy	—	—	—
Latvia	C	110	4.77
Lithuania	A	68	1.99
Luxembourg	C	20	4.40
Malta	C	8	1.99
Netherlands	C	29	0.18
Poland	C	2 997	7.85
Portugal	C	96	0.91
Slovakia	C	25	0.46
Slovenia	C	10	0.50
Spain	C	265	0.62
Sweden	C	2 610	28.96
United Kingdom	C	10 532	17.54
EU total		**29 167**	**8.70**
Iceland	C	44	14.99
Liechtenstein	—	—	—
Norway	C	32	0.69
Total		**29 243**	**8.60**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

Age and gender distribution

The highest incidence rates of hepatitis C are reported in the age group 25–44 (9.74 per 100 000) (figure 4.18.2). 62% of the reported cases were in males.

Figure 4.18.2. Age-specific incidence distribution of hepatitis C cases for selected European countries, 2005 (n = 16 625)



Source: Country reports. Reports with age-specific data were available from: Cyprus, Czech Republic, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Latvia, Malta, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden and Norway.

Seasonality

No seasonal trends were detected in the incidence data on hepatitis C.

Conclusions

- There are clear limitations with the HCV surveillance data, also linked to difficulties in the interpretation of HCV test results. Currently, the data are inadequate to describe the true HCV infection trend and disease burden.
- Nevertheless, data over the last decade suggests that HCV represents the most common form of viral hepatitis in the EU.
- The real transmission pattern (prevalence levels, viral genotypes involved, routes of transmission, risk groups) should be more thoroughly investigated in the EU with specific epidemiological studies, in order to implement better targeted actions to prevent long-term liver disease.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y

Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting HCV, Chlamydia	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Laboratory based surveillance of Hepatitis C: RenaVHC	V	Se	P	C-B	Y	N	N	N	N
France	Newly referred hepatitis C infection in hepatology reference centres	V	Se	A	C-B	N	N	Y	N	Y
France	Surveillance of viral blood borne infections in blood donors	O	Co	A	C-B	N	N	N	Y	Y
France	HIV, HCV and HBV testing in unlinked anonymous testing sites	C	Co	P	A	N	N	N	Y	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance	C	Co	P	C-B	N	Y	Y	N	Y

	system									
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Hepatitis C Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Hepatitis C	O	Co	A	C-B	Y	N	Y	N	Y

4.19 Influenza

Influenza is an acute viral disease of the respiratory tract which is transmitted though large droplets (airborne) or through fomites. The natural host of the influenza viruses is wild waterfowl. However, certain influenzas are well adapted to humans and there are three recognised types of human influenza virus (A, B and C), which are further sub-classified in a number of subtypes. The most pathogenic are the subtype A. Each year there are epidemics during the winter season, giving rise to the term 'seasonal influenza', although sporadic cases do occur throughout the year. There are constant genetic changes in the makeup of the human influenza viruses which is a contributing factor in the variation of the intensity of the winter epidemics and annual incidence. Because many cases are mild, the true annual incidence is hard to determine. One estimate, involving people up to age 18, was of an average of 5% per annum[1]. The incidence in older people is likely to be somewhat lower as they would have some acquired immunity. However, the economic cost is considerable because hospitalisation rates are generally about 0.2% and the mortality rates about 0.1%. People most likely to suffer severe disease are the elderly, those with severe chronic underlying illness and the very young.

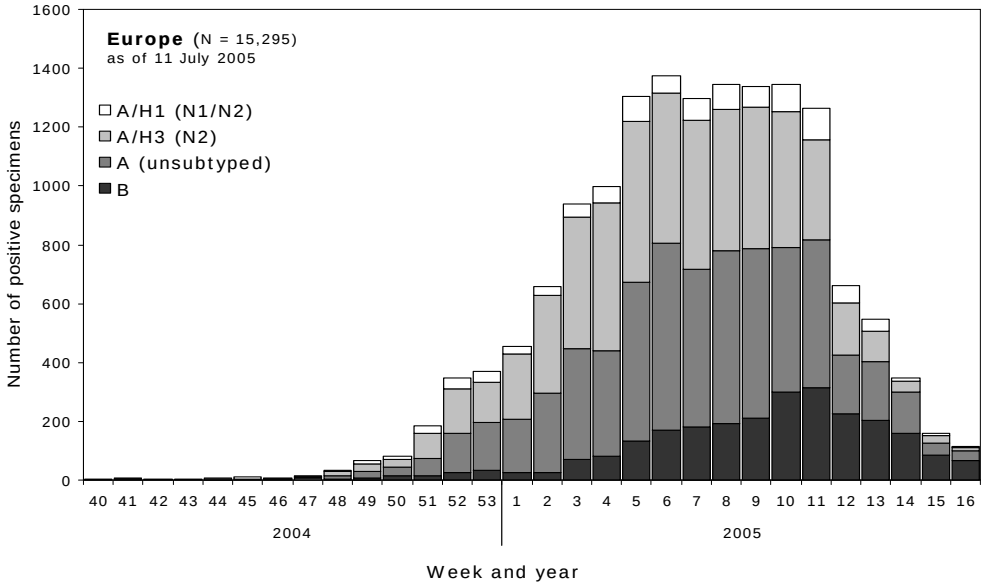
At irregular intervals new influenza A subtypes emerge, as a result of antigenic shift or recombination, leading to a 'pandemic influenza' which may last for six to eight months, and usually with a much higher morbidity and mortality than the seasonal variety. The clinical incidence rates can be 25% or higher, hospitalisation rates around 0.6% and the case fatality rates can be expected to be about 0.3% (though in the famous 1918–19 pandemic they reached 2%). In the three pandemics of the 20th century, the excess deaths have been estimated at 20 million (1918), 1 million (1957–58) and 1 million (1967–68). Due to its annual economic burden and the constant threat of a pandemic, influenza is considered to be one of the most acute threats to the population of Europe, as it is to the rest of the world[2].

Surveillance for influenza generally relies on a combination of laboratory and primary care surveillance. In the EU this is provided through the European Influenza Surveillance Scheme (EISS)[3].

EISS data for 2004–05

The 2004–05 influenza season in Europe started in late December 2004 with the first influenza activity occurring in the northwest and southwest (Spain, United Kingdom and Ireland). The intensity of clinical influenza activity in 10 out of 23 countries was higher than during the 2003–04 season, and either lower or equal to the 2003–04 season in the other 13 countries. The highest consultation rates were generally observed among children aged 0–14 years. In all, the peak consultation rates due to influenza-like illness or acute respiratory infection were not especially high when compared with historical data.

Figure 4.19.1. Trend of the number of sentinel and non-sentinel specimens positive for influenza viruses, by week, for Europe during the 2004–05 season



Source: EISS[4]. Data from Austria, Belgium, Czech Republic, Denmark, England, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Northern Ireland, Norway, Poland, Portugal, Romania, Scotland, Slovakia, Slovenia, Spain, Switzerland and Wales.

The predominant virus strain (figure 4.19.1, table 4.19.1) was influenza A (83% of total detections) of the H3 subtype (85% of H-subtyped A viruses), with fewer influenza B (17% of total detections) or A(H1) viruses (15 % of H-subtyped A viruses) detected. The vast majority of A/H3 viruses were similar to the reference strains A/Wellington/1/2004 (H3N2) and, subsequently, A/California/7/2004 (H3N2) that are closely related drift variants of the A/Fujian/411/2002 (H3N2) prototype vaccine strain.

B viruses were co-circulating with the A viruses during the whole influenza season in 11 out of 24 countries. Seven of these were located in the northeast of Europe and in these countries the proportion of B viruses was higher (range: 31–60%) than in the rest of Europe (range: 6–26%). In 13 out of 24 countries the B viruses circulated relatively late in the season. About 43% of all antigenically characterised B viruses were B/Hong Kong/330/2001-like (B/Victoria/2/87 lineage), a strain that is distinguishable from the vaccine influenza B strain, which was a B/Yamagata/16/88 lineage virus. Based on the viruses detected worldwide up to February 2005, the World Health Organization modified the recommended composition of the 2005–06 influenza vaccine to include a new A(H3N2) component: an A/California/7/2004 (H3N2)-like virus.

Table 4.19.1. Overview of influenza activity in the EISS countries during the 2004–05 season([a])

Country (N=26)	Week(s) of peak clinical morbidity	Most affected age groups([b])	Intensity (peak level)	Week(s) of peak virus detections([c])	Dominant virus type/subtype	Geographical spread (peak level)
Influenza-like illness						
Austria	7	0–4	High	9	A/H3N2	Widespread
Belgium	6–8	5–14, 0–4	Medium	9	A/H3N2	Widespread
Denmark	11	0–4, 5–14	High	8	A/H3N2	Widespread

England	No peak	None	Medium	5	A/H3N2	Regional
Ireland	1	15–64	Medium	53	A/H3N2	Local
Italy	6	0–4, 5–14	High	5	A/H3N2	Widespread
Latvia	11–12	0–4, 5–14	Medium	9	A/H3	Regional
Lithuania	11	N/A	High	N/A	N/A	Regional
Luxembourg	7	N/A	High	7	A/H3N2	Widespread
Malta	8–9	N/A	N/A	N/A	N/A	N/A
Netherlands	7	0–4, 65+	High	7	A/H3	Widespread
Northern Ireland	50 + 1	0–4	Medium	N/A	A/H3	Sporadic
Norway	12	5–14, 15–64	Medium	7	A/H3N2	Widespread
Poland	8–11	0–4, 5–14	High	10	A/H3 + B	Regional
Portugal	5	5–14, 65+	High	4	A/H3	Widespread
Romania	11	15–64, 5–14	Medium	11	A/H3N2	Regional
Scotland	No peak	N/A	Low	5 + 10	A/H3	Sporadic
Slovakia	11	5–14, 0–4	Medium	10	A/H3 + B	Local
Slovenia	7	0–4, 5–14	Medium	8	A/H3N2 + B	Widespread
Spain	2–3	5–14, 0–4	High	2	A/H3	Widespread
Sweden	11	N/A	Medium	9	A	Widespread
Switzerland	6	0–4, 5–14	Medium	5	A/H3	Widespread
Wales	No peak	None	Low	7	A	Sporadic
Acute respiratory infections						
Czech Republic	8	0–4, 5–14	Medium	9	A	Widespread
France	6	0–4, 5–14	Medium	5	A/H3N2	Widespread
Germany	7–9	0–4, 5–14	High	10	A/H3	Widespread

Source: EISS.

([a]) Sentinel data, except for dominant virus type/subtype for which sentinel and non-sentinel data were taken into account. N/A = not applicable as no or insufficient data were available. No peak = activity was not above baseline or was flat during the whole season.

([b]) If two age groups are shown the first is the most affected, followed by the second most affected.

([c]) Estimated primarily taking into account the percentage of influenza virus positive specimens and secondarily the absolute number of isolates when the percentage positive specimens was ambiguous.

A summary of the historical European data is presented in table 4.19.2. This table includes both sentinel and non-sentinel data for nine influenza seasons. Overall, the total number of specimens increased over time as the number of member countries participating in the EISS project increased.

The specimens tested positive more frequently for influenza A than influenza B, the proportion of which varied by season (range 0.9% to 36.4%). In eight out of nine seasons the influenza A/H3N2 subtype was reported most often. In one season (2000–01) the subtype influenza A/H1N1 was reported most frequently.

Table 4.19.2. Summary of total sentinel and non-sentinel data for influenza in Europe: historical data([a])

Season	Influenza virus detections			N-subtyped viruses			
	Total (N)	% of total positive for		Total (N)	% of total positive for		
		influenza A	influenza B		A(H1N1) ([b])	A(H1N2) ([b])	A(H3N2) ([b])
2004–05	15 295	83.3	16.7	2 569	18.2	0.1	81.8
2003–04	14 025	99.1	0.9	4 284	0.5	0.4	99.1
2002–03	7 616	63.4	36.4	2 987	9.7	1.5	88.8
2001–02	7 296	74.9	25.1	2 718	3.8	8.8	87.3
2000–01	6 352	70.3	29.7	1 357	96.7	0.2	3.1
1999–2000	7 663	98.8	1.2	4 093	1.8	—	98.2
1998–99	6 950	71.9	28.1	2 760	0.4	—	99.6
1997–98	6 008	92.7	7.3	2 155	4.4	—	95.6
1996–97	5 503	79.9	20.1	1 339	1.0	—	99.0

Source: EISS.

(a) Based on data available in the EISS database on 11 July 2005.

(b) During the 2001–02 season, a novel influenza A(H1N2) virus was reported by a number of countries in Europe; this has led to an improvement in reporting of the influenza A neuraminidase subtyping (N1 or N2), in addition to the hemagglutinin subtyping (H).

Conclusions

- The most important aspect of influenza is its pandemic potential, with huge pandemics of varying severity occurring at irregular intervals. It is impossible to predict which will be the next pandemic strain, or when it will appear.
- Seasonal influenza also poses a considerable public health threat. The vaccine coverage in the risk groups varies greatly across the EU, and it is an important task for ECDC and the Member States to increase coverage up to the levels recommended by WHO.

References

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2. Potter CW. Chronicle of influenza pandemics. In Nicholson KG, Webster RG, Hay AJ , eds. Textbook of influenza. London: Blackwell scientific publications: 1998, p3–18.

3. European Influenza Surveillance Scheme. Annual report: 2004–2005 influenza season. Utrech, the Netherlands, Nivel, 2006. http://www.eiss.org/html/annual _reports.html.

4. http://www.eiss.org/documents/eiss_annual_report_2004-2005_+_cover.pdf.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	Influenza SENTINELLA System	V	Se	A	C-B	Y	Y	N	N	N
BELGIUM										
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	Surveillance of ARI / ILI in the Czech Republic	O	Se	P	A	N	Y	N	Y	Y
Denmark	Influenza surveillance	V	Se	A	A	N	Y	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Influenza	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Sentinelles	V	Se	A	C-B	N	Y	N	N	Y
France	Seasonal real time influenza mortality	V	Se	A	C-B	N	N	N	Y	Y
France	GROG	V	Se	P	A	Y	Y	Y	Y	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Greece	Sentinel	V	Se	P	A	N	Y	N	N	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Influenza surveillance	C	Se	P	A	Y	Y	N	Y	Y
Iceland	Mandatory surveillance of notifiable diseases in Iceland	C	Co	P	A	Y	Y	N	N	Y
Ireland	influenza sentinel surveillance	V	Se	P	N	Y	Y	N	Y	N
Ireland	General and EU case	C	Co	P	C-B	Y	Y	N	N	Y

	definition									
Italy	INFLUNET	C	Se	P	A	N	Y	N	N	N
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Latvia	Surveillance system for influenza and other acute respiratory diseases	C	Se	P	A	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	Influenza	V	Se	P	C-B	N	Y	Y	N	Y
Malta	Influenza sentinel surveillance	V	Se	A	C-B	Y	Y	N	N	N
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Netherlands	Influenza surveillance	V	Se	P	C-B	Y	Y	N	N	N
Norway	MSIS (group C-diseases: influenza)	C	Se	A	A	N	Y	N	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Influenza Surveillance System	V	Se	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Slovenia	ILI and ARI surveillance	V	Se	P	A	N	Y	N	N	Y
Spain	Influenza Surveillance System	V	Se	P	C-B	Y	Y	Y	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Influenza	V	Ot	A	C-B	Y	N	Y	Y	Y

4.20 Legionnaires' disease (legionellosis)

Legionellosis is a respiratory disease caused by bacteria belonging to the *Legionellae* genus. The species most frequently causing disease in humans is *Legionella pneumophila*. Legionellae are environmental micro-organisms able to survive a wide range of temperatures. Their reservoirs are aquatic systems like cooling towers, evaporative condensers, humidifiers, decorative fountains, hot water systems and similar systems.

The most common mode of transmission is airborne by inhalation of contaminated aerosols. No cases of person-to-person transmission have been recorded. After exposure, the incubation period varies from two to ten days. The clinical picture is characterised by myalgia, headache, fever, and pneumonia (associated with a non-productive cough). In most cases legionellosis can be treated effectively with antibiotics, but case fatality rates can be high among the elderly and in immunocompromised individuals.

Prophylactic measures include regular cleaning and adequate maintenance of the particular water systems.

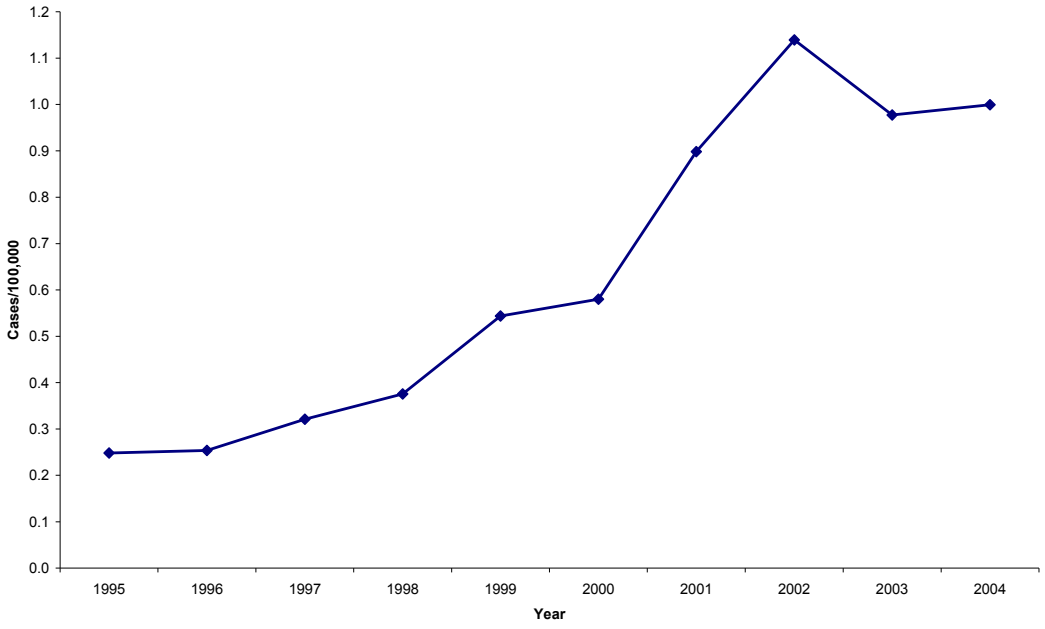
10-year trends

Some data on legionellosis incidence are available for the period 1995 to 2004 from all 25 EU Member States, Iceland and Norway, although complete data for the whole period are available only from 13 countries (Czech Republic, Denmark, Finland, France, Ireland, Italy, Latvia, Malta, Netherlands, Slovenia, Sweden, United Kingdom and Norway).

The overall incidence of legionellosis was increasing between 1996 and 2002 in the EU. Since 2002, the incidence has remained stable at around one per 100 000.

This trend may partly be explained by the greater availability of improved diagnostic methods such as urine antigen testing.

Figure 4.20.1. Incidence rate of legionellosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The situation in 2005

In 2005, a total of 4 189 human legionellosis cases were reported by 23 countries. The highest incidence of 3.36 per 100 000 was seen in Spain, followed by Iceland with 2.38 per 100 000. The overall incidence rate for 2005 is estimated at 1.06 per 100 000.

Table 4.20.1. Number of legionellosis cases in the EU and EEA/EFTA, 2005

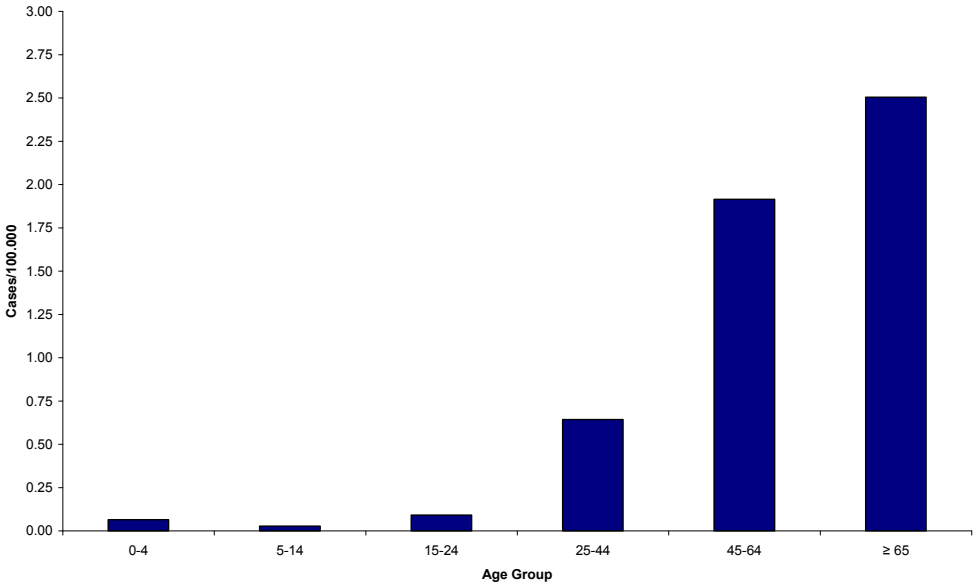
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	65	0.79
Belgium	C	176	1.68
Cyprus	C	0	0.00
Czech Republic	C	9	0.09
Denmark	C	115	2.13
Estonia	C	2	0.15
Finland	—	—	—
France	—	—	—
Germany	C	524	0.64
Greece	C	19	0.17
Hungary	C	13	0.13
Ireland	C	9	0.22
Italy	C	885	1.51
Latvia	C	0	0.00
Lithuania	C	1	0.03
Luxembourg	—	—	—
Malta	C	5	1.24
Netherlands	C	275	1.69
Poland	C	9	0.02
Portugal	C	39	0.37
Slovakia	C	1	0.02
Slovenia	—	—	—
Spain	C	1 447	3.36
Sweden	C	107	1.19
United Kingdom	C	393	0.65
EU total		**4 094**	**1.05**
Iceland	C	7	2.38
Liechtenstein	—	—	—
Norway	C	88	1.91
Total		**4 189**	**1.06**

Source: Country reports. *C: Case-based report; —: No report.

Age and gender distribution

Information about age groups was available from 19 EU Member States (although Cyprus and Latvia reported zero cases). The highest incidence of 2.5 per 100 000 was reported in the age group ≥ 65 years followed by the age group 45–64 years with an incidence of 1.91 per 100 000. The older age groups accounted for 81% of all reported cases. The data on gender were available for 18 EU Member States (n = 3 098). A significantly higher incidence was seen for men (1.18 per 100 000) than for women (0.4 per 100 000).

Figure 4.20.2. Age-specific incidence distribution of legionellosis cases for selected European countries, 2005, (n = 3 204)

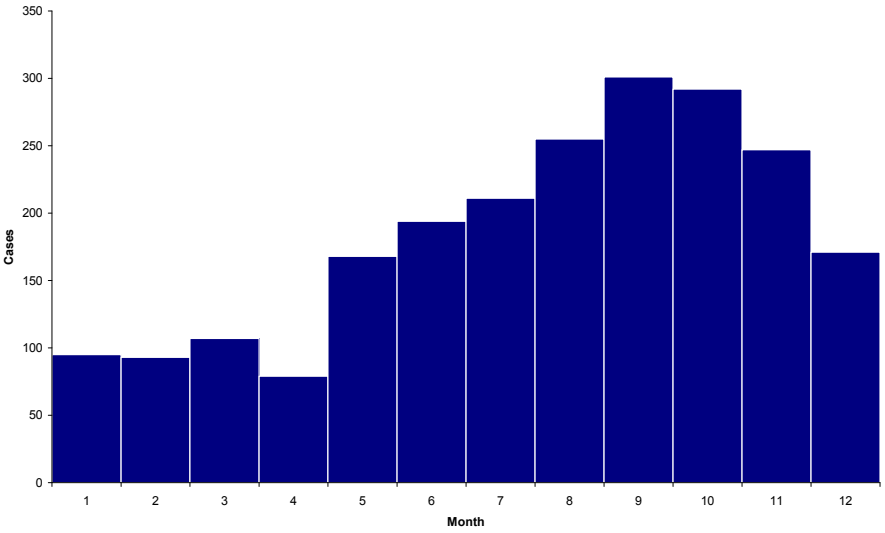


Source: Country reports. Reports with age-specific data were available from: Belgium, Czech Republic, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Italy, Malta, Netherlands, Portugal, Slovakia, Spain, Sweden, Iceland and Norway; while Cyprus and Latvia reported zero cases.

Seasonality

Legionellosis cases show a clear pattern of seasonality, with steadily increasing numbers during the summer months reaching a peak in September and October, then gradually dropping off in the winter months.

Figure 4.20.3. Distribution of legionellosis cases by month, for selected European countries, 2005, (n = 2213)



Source: Country reports. Reports with seasonal data were available from: Austria, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, Iceland and Norway; while Cyprus and Latvia reported zero cases.

Imported cases

The importation status was described for 1 620 cases from eight EU Member States. Of these, 92% were believed to have been acquired domestically. In the Netherlands, 34% of cases are believed to have been imported.

EWGLINET data

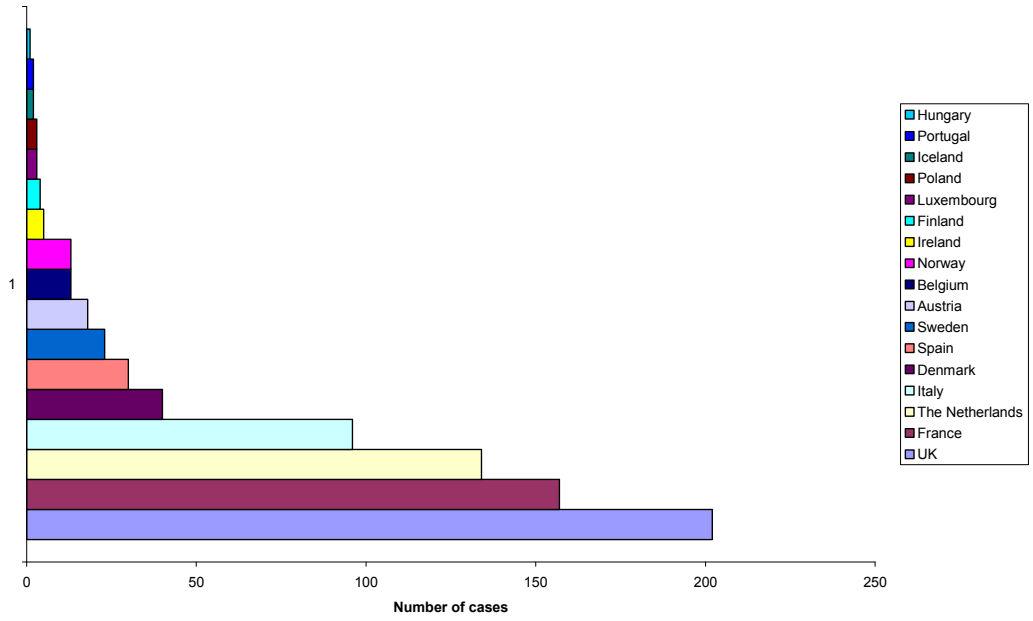
The EWGLINET is a European-wide dedicated surveillance network which collects data on travel-associated legionnaires' disease cases. It aims to detect early outbreaks and clusters of legionnaires' disease related to travel in order to initiate rapid response at the European level.

In 2005, 746 cases of travel-associated legionnaires' disease with onset in 2005 were reported to the EWGLINET surveillance scheme by 15 Member States (731), Iceland (2) and Norway (13). In addition, six cases were reported by Turkey, two cases by Australia, and one by the USA, giving a total of 755 cases with onset in 2005. The urinary antigen test diagnosed 85.8% of cases, and 37 cultures were obtained. Twenty-nine deaths were reported, giving a case fatality rate of 3.8%.

Ninety-three new clusters were identified, 36.6% of which would not have been detected without the EWGLINET scheme. One hundred and twenty-two accommodation sites were investigated and the names of nine sites were published on the EWGLI website.

Thirty-three sites were associated with additional cases after a report was received to say that investigations and control measures had been satisfactorily carried out. This level of re-offending is greater than in previous years and care should be taken to ensure the guidelines are being properly applied.

Figure 4.20.4. Number of reported travel-related cases of legionnaires' disease by countries in 15 MS, Iceland and Norway in 2005, n = 746



Source: EWGLINET.

Monitored threats in 2005

Six outbreaks of legionellosis were monitored in 2005. Four were community outbreaks and two were related to hotels. Three of the community outbreaks occurred in Spain and one in Norway. In one outbreak, cooling towers were confirmed as a source and in one outbreak they were suspected as the source. One outbreak was due to an air-cleaner. Legionellosis cases related to staying in hotels were detected in Italy and in Turkey through EWGLINET. The source of information for the outbreaks was EWRS (two events), Promed (two events) and EWGLINET (two events).

Conclusions

- Legionellosis cases increased steadily from 1995 to 2002 but the incidence has since stabilised.
- Legionellosis mainly affects older people and men more than other sections of the population.
- More cases are reported in late summer and early autumn months.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Legionellosis	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification	C	Co	P	C-B	Y	Y	Y	Y	Y

	of infectious diseases									
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	legionella and TB	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Legionellosis Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y

United Kingdom	UK Legionellosis	O	Co	A	C-B	Y	N	Y	Y	Y

4.21 Leptospirosis

Leptospirosis is a zoonotic disease caused by bacteria belonging to the genus *Leptospira*, i.e. *Leptospira interrogans* (*Leptospira* spp. also include *Leptospira biflexa*). Although more common in tropical areas of the world, the disease is also present in temperate areas, including Europe. There are over 200 known pathogenic *Leptospira* serovars, for which different species of domestic and wild animals act as maintenance hosts.

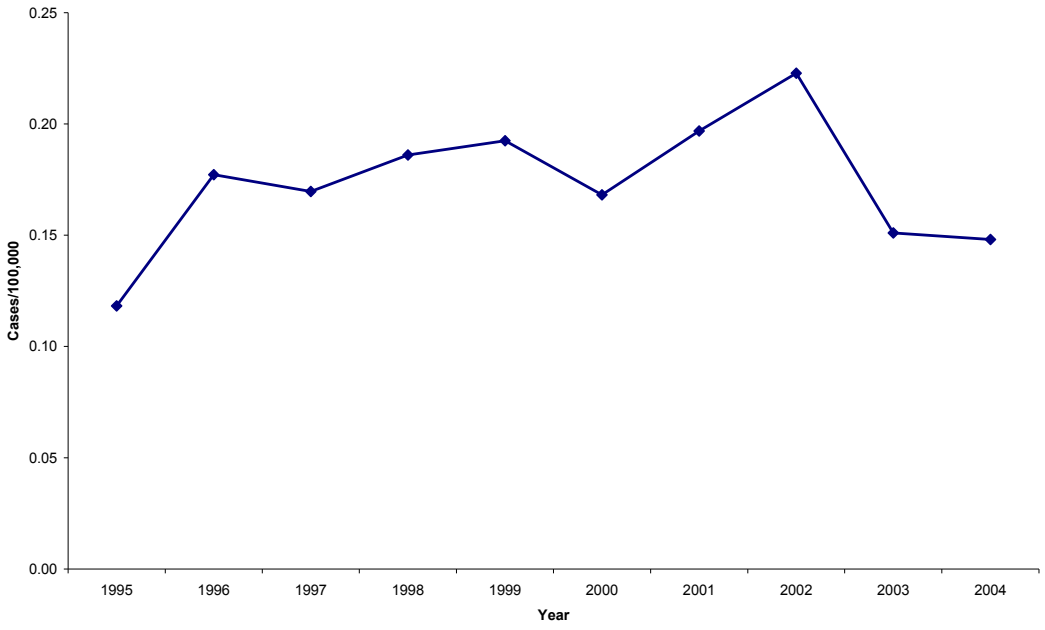
Humans acquire leptospirosis either from direct contact with the urine of infected animals, or from contact with material contaminated by it, such as water or soil. After exposure, the incubation period ranges between two and 30 days (with an average of 10 days). The clinical presentation is variable, partly depending on the *Leptospira* species involved. Fever, myalgia and conjunctivitis are very frequent. Liver, kidney, lung, heart, and more rarely cerebral involvement and haemorrhagic symptoms characterise the most serious clinical presentations. Timely antibiotic treatment is effective, and the case fatality rate is low, but does increase with advancing age and may reach up to 20% or more in complicated cases with multi-organ failure.

Preventive measures include controlling rodent populations, avoiding contaminated areas and covering cuts and abraded skin when operating in the environment. Immunisation of persons at occupational risk of exposure has been carried out in some countries (Italy, France, Spain)[1].

10-year trends

All countries reported for the whole period, apart from five that submitted reports for some of the years only (Liechtenstein did not submit any reports). The overall incidence was stable in the EU during the period 1995–2004, ranging from 0.1 to 0.22 cases per 100 000. The lowest number of cases in recent years (688) was reported in 2004. France continues to report a high number of cases, partly related to higher incidence in its overseas departments (Antilles, Guyane and La Réunion).

Figure 4.21.1. Incidence rate of leptospirosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat.

The situation in 2005

In 2005, 900 cases were reported by 24 countries, with Estonia (0.82 per 100 000) followed by France (0.77 per 100 000) reporting the highest incidence. The overall incidence of 0.2 per 100 000 was reported in 2005 (table 4.21.1).

Table 4.21.1. Number of leptospirosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	8	0.10
Belgium	C	12	0.11
Cyprus	C	0	0.00
Czech Republic	C	55	0.54
Denmark	C	11	0.20
Estonia	C	11	0.82
Finland	C	3	0.06
France**	C	479	0.77
Germany	C	56	0.07
Greece	C	0	0.00
Hungary	C	32	0.32
Ireland	C	15	0.37
Italy	C	34	0.06
Latvia	C	8	0.35
Lithuania	C	7	0.20
Luxembourg	—	—	—
Malta	C	3	0.74
Netherlands	C	27	0.17
Poland	C	5	0.01
Portugal	C	26	0.25
Slovakia	C	35	0.65
Slovenia	C	8	0.40
Spain	C	1	0.00
Sweden	C	3	0.03
United Kingdom	C	61	0.10
EU total		**900**	**0.20**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	—	—	—
Total		**900**	**0.20**

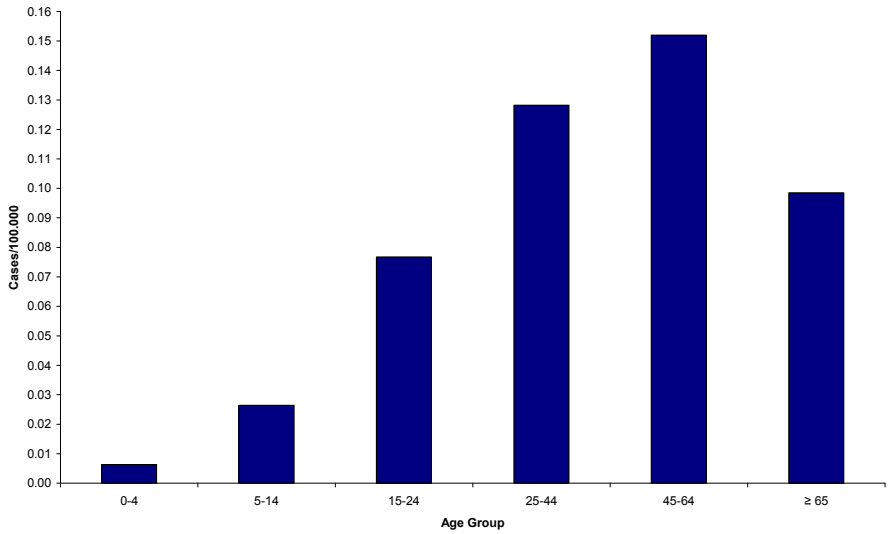
Source: Country reports. *A: Aggregated report; C: Case-based report; 0: No case reported; —: No report.

**212 in mainland France and 267 from the overseas departments Antilles, Guyane and La Réunion.

Age and gender distribution

The highest incidence was reported in the 45–64 year age group (0.15 per 100 000), followed by the 25–44 year-old group (0.13 per 100 000) (figure 4.21.2). Seventy-nine percent (275 out of the 346 with data on gender) of the cases were male. This may be related to the exposure risks resulting from certain occupations, as well as the risk of exposure during water sports.

Figure 4.21.2. Age-specific incidence distribution of leptospirosis cases for selected European countries, 2005 (n = 344)

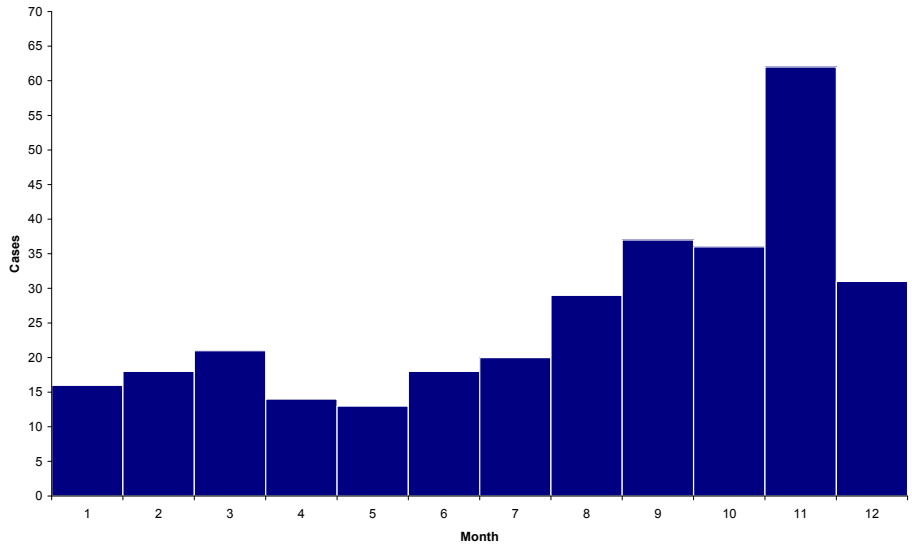


Source: Country reports. Reports with age-specific data were available from: Belgium, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, Netherlands, Poland, Portugal, Slovakia, Spain and Sweden; while Cyprus reported zero cases.

Seasonality

Autumn is the season with the highest number of reported cases, mainly during the month of November, followed by September and October (figure 4.21.3).

Figure 4.21.3. Distribution of leptospirosis cases by month, for selected European countries, 2005 (n = 315)



Source: Country reports. Reports with seasonal data were available from: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom; while Cyprus and Iceland reported zero cases.

Conclusions

- Leptospirosis remains of some concern in the EU with most cases related to occupational or recreational exposures.
- Countries with the highest incidence in the past have experienced a significant decrease in recent years.

References

1. Communicable disease control handbook, Jeremy Hawker et al. 2nd Edition 2005.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Leptospirosis	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y

Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway										
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Leptospirosis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Leptospirosis	O	Co	P	C-B	Y	N	Y	Y	Y

4.22 Listeriosis

Listeriosis is a disease caused bacteria belonging to the genus *Listeria.* Almost all human cases are caused by the species *Listeria monocytogenes*. The disease primarily causes problems in pregnant women, newborns, and adults with a weakened immune system.

Listeriae are ubiquitous in the environment, and food-borne outbreaks have been detected worldwide. Many animals carry the bacteria in their faeces.

After exposure (via contaminated food) most immuno-competent adults do not develop any symptoms, except in the case of pregnant women. After an incubation period of about three weeks (median) the latter may manifest a self-limiting influenza-like illness which is, in reality, due to bacteremia which may affect the uterus. In that case, it can lead to death of the foetus and consequent abortion or to a dramatic picture of congenital listeriosis in the newborn.

In addition, *Listeria* infection in immuno-compromised adults and the elderly may lead to meningitis, encephalitis, and septicaemia.

All clinical presentations are treatable with prolonged courses of antibiotics, but the prognosis of the most serious ones is poor.

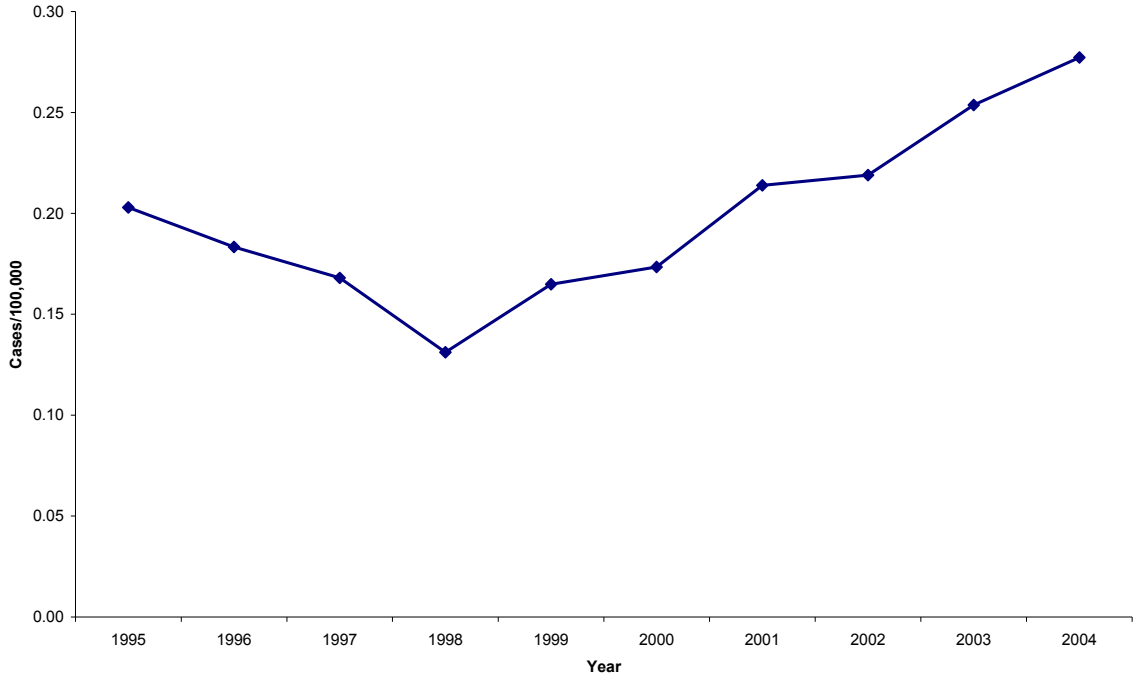
Control measures should be aimed at the farm and food-processing level, in order to prevent contamination of food products. Preventive measures include providing appropriate information for consumers on how to minimise the risk of ingesting food contaminated by listeria.

10-year trends

Only 14 countries reported data for the whole period, while Austria, Cyprus and Liechtenstein did not submit reports for any of the years. For interpretation of these reported cases, it is important to distinguish between diverse reporting methods in several countries (reporting only of mothers or of mother-child pairs) as well as the different case definitions actually in use and notification practices of listeriosis cases in different European countries.

The annual incidence in Europe decreased between 1995 and 1998, but since then has shown a sustained increasing trend. The incidence in 2004 (0.28 per 100 000) was similar to that for 1995.

Figure 4.22.1. Incidence rate of listeriosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Austria, Cyprus and Liechtenstein.

The situation in 2005

Twenty-six countries reported 1 491 cases in 2005. Denmark (0.85 per 100 000), followed by Finland (0.69 per 100 000) reported the highest incidence rates.

The overall incidence in the EU was estimated as 0.33 per 100 000 population.

Table 4.22.1. Number of listeriosis cases in the EU and EEA/EFTA, 2005

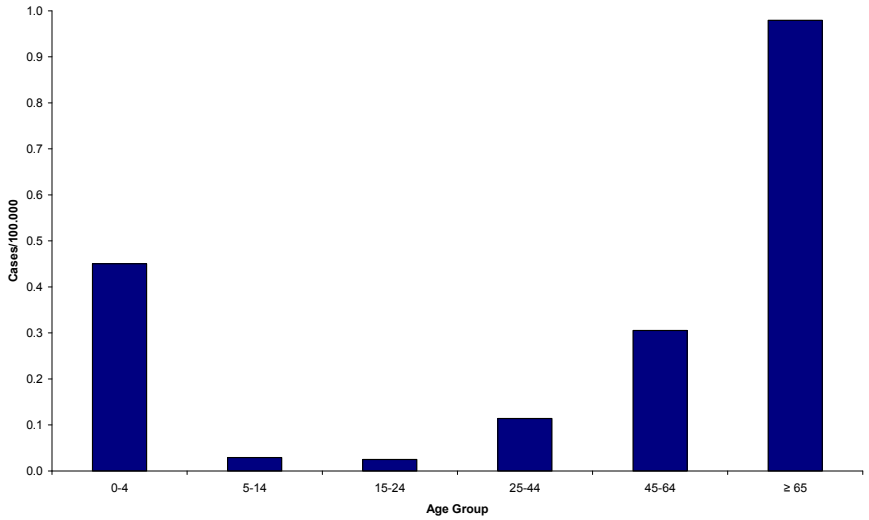
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	20	0.24
Belgium	C	62	0.59
Cyprus	C	0	0.00
Czech Republic	C	15	0.15
Denmark	C	46	0.85
Estonia	A	2	0.15
Finland	C	36	0.69
France	C	221	0.35
Germany	C	510	0.62
Greece	C	8	0.07
Hungary	C	10	0.10
Ireland	C	12	0.29
Italy	C	59	0.10
Latvia	C	3	0.13
Lithuania	C	2	0.06
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands	C	96	0.59
Poland	C	22	0.06
Portugal	—	—	—
Slovakia	C	5	0.09
Slovenia	C	3	0.15
Spain	C	80	0.19
Sweden	C	41	0.45
United Kingdom	C	223	0.37
EU total		**1 476**	**0.33**
Iceland	C	1	0.34
Liechtenstein	—	—	—
Norway	C	14	0.30
Total		**1 491**	**0.33**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

Age and gender distribution

Overall, 55.4% of the reported listeriosis cases occurred in individuals over 65 years of age (0.98 per 100 000) and this age group shows the highest incidence. Listeriosis cases in children aged less than four years accounted for 6.9% of the cases, with the second highest incidence of 0.45 per 100 000. Men and women were represented equally among the cases (0.23 per 100 000 and 0.20 per 100 000 respectively) among the 944 cases for which the data were available. There are data to suggest that in 2005, 96 listeriosis cases were associated with pregnancy.

Figure 4.22.2. Age-specific incidence distribution of listeriosis cases for selected European countries, 2005 (n = 740)

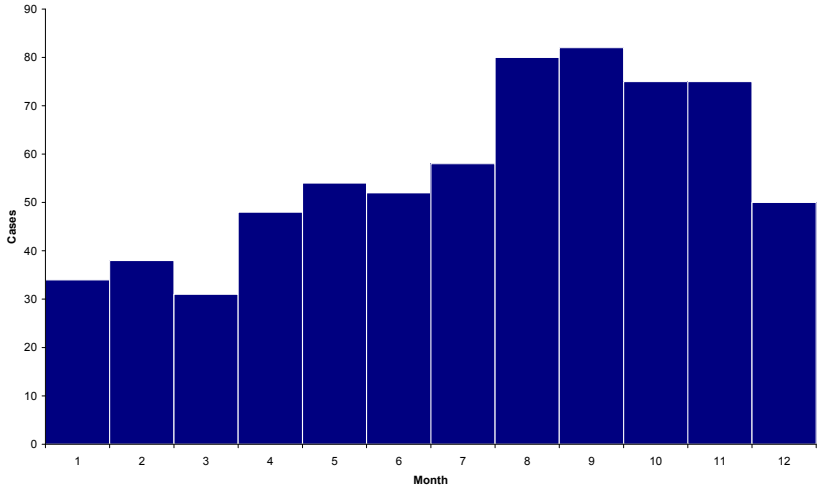


Source: Country reports. Reports with age-specific data were available from: Austria, Czech Republic, Estonia, Germany, Hungary, Ireland, Italy, Slovakia, Spain, Sweden, Iceland and Norway; while Cyprus, Luxembourg and Malta reported zero cases.

Seasonality

Human cases of listeriosis show some level of seasonality with higher numbers of cases reported in the second half of the year.

Figure 4.22.3. Distribution of listeriosis cases by month, for selected European countries, 2005 (n = 677)



Source: Country reports. Reports with seasonal data were available from: Austria, Estonia, Germany, Hungary, Ireland, Poland, Portugal, Slovakia, Spain, Sweden, Iceland, Liechtenstein and Norway; while Cyprus, Luxembourg and Malta reported zero cases.

Imported cases

The majority of the countries reported that the majority of the cases were domestic or of unknown origin. Only four Member States reported confirmed imported cases, generally less than 6% of the cases.

Conclusions

- Listeriosis cases showed an increasing trend from 1998–2003, with a slight decrease in 2004, but this should be interpreted with caution because the case definition and notification are different in European countries.
- The majority of cases are reported in those over 65.
- Most cases seem to be domestically acquired.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Listeriosis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	EPIBAC, Community invasive infections hospitalized	V	Se	A	C-B	Y	N	Y	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y

Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	active surveillance Listeria monocytogenes	V	Co	A	C-B	Y	N	N	N	Y
Netherlands	bacterial meningitis/septicaemia	V	Co	P	C-B	Y	N	N	N	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Listeriosis	V	Co	A	C-B	Y	N	Y	Y	Y

4.23 Malaria

Malaria is caused by protozoans belonging to the genus *Plasmodium.* Four *Plasmodium* species (*Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale* and *Plasmodium malariae*) are pathogenic for humans, and humans are their only epidemiologically relevant reservoir. Transmission requires an intermediate host, being mosquitoes of several species belonging to the genus *Anopheles*, which is found worldwide.

Following exposure (an infected mosquito bite) the incubation period varies between one and four weeks in most cases. Depending on the plasmodium species involved, much longer incubation periods are possible.

Once the *Plasmodia* reproduce inside the red blood cells, fever and multi-organ disease may ensue, which can be life-threatening when *P. falciparum* is involved. Symptoms are much reduced if the patient has been rendered semi-immune by repeated infection. Also, appropriate treatment (several drugs are available) is usually effective.

During the 20th century, Malaria was eradicated from many temperate areas, including the whole of the EU. As a result, the disease is now essentially limited to tropical countries. With global climate change, the potential for the reappearance of malaria in countries where it was previously eradicated is a growing concern. Malaria vectors are in fact still present in those areas, including in Europe.

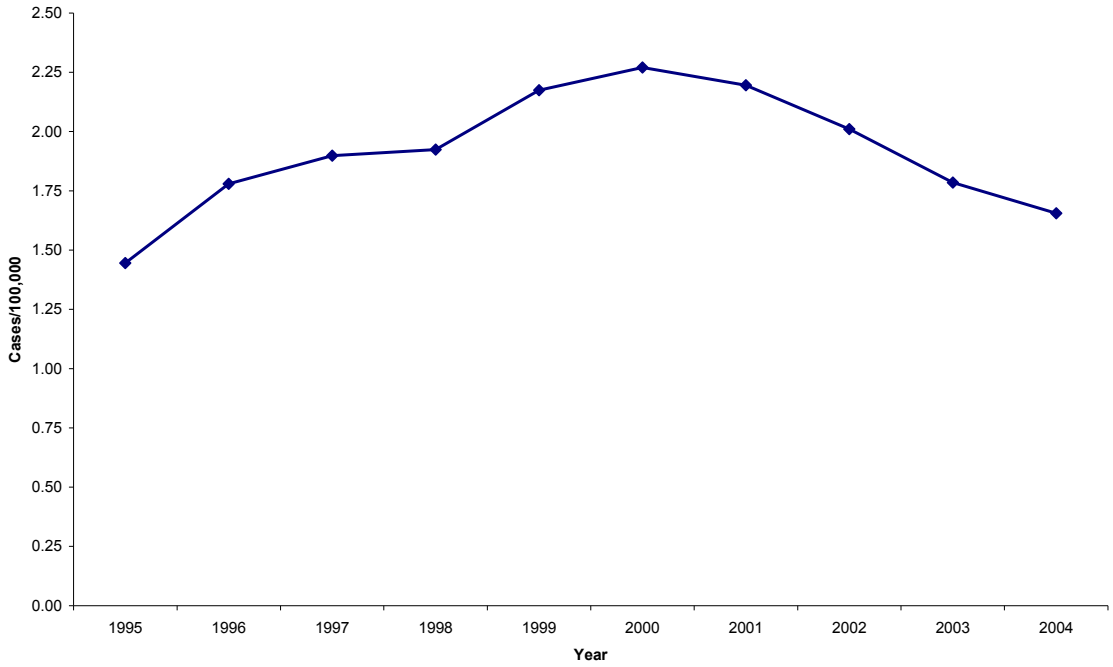
Due to the large number of imported cases in Europe, malaria surveillance is mainly a travel medicine issue. Nonetheless, ‘airport malaria’ is sometimes reported in relation to the inadvertent transport of infected mosquitoes from endemic areas.

10-year trends

All countries of the EU25, Norway and Iceland reported cases for the whole period with just the years 2000 (Iceland) and 2002 (Slovenia) having a missing report (Liechtenstein did not submit any reports).

Since 1995, France has accounted for a large proportion (36.33%) of the imported malaria cases to Europe, mainly through its close ties with several African, highly endemic, countries. Over the period, the overall incidence rates have ranged from 1.45 to 2.27 per 100 000, with a slight but steady decrease since 2000. The favourable trend in recent years contrasts with the increasing numbers of malaria seen in endemic countries (figure 4.23.1).

Figure 4.23.1. Incidence rate of malaria cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The situation in 2005

In 2005, 4 306 malaria cases were reported by 26 countries (France not reporting this year). This suggests an overall crude incidence rate of 1.07 per 100 000 (table 4.23.1), although this statistic does not take into consideration the main determinants of risk such as travel to endemic areas, or the proportion of the population originating from high endemic areas.

Table 4.23.1. Number of malaria cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	54	0.66
Belgium	C	270	2.58
Cyprus	C	2	0.27
Czech Republic	C	18	0.18
Denmark	C	87	1.61
Estonia	C	0	0.00
Finland	C	27	0.52
France	—	—	—
Germany	C	564	0.68
Greece	C	19	0.17
Hungary	A	4	0.04
Ireland	C	44	1.07
Italy	C	638	1.09
Latvia	C	4	0.17
Lithuania	C	2	0.06
Luxembourg	C	3	0.66
Malta	C	2	0.50
Netherlands	C	302	1.85
Poland	C	20	0.05
Portugal	C	50	0.47
Slovakia	C	1	0.02
Slovenia	C	8	0.40
Spain	C	284	0.66
Sweden	C	114	1.27
United Kingdom	C	1 754	2.92
EU total		**4 271**	**1.07**
Iceland	A	0	0.00
Liechtenstein	—	—	—
Norway	C	35	0.76
Total		**4 306**	**1.07**

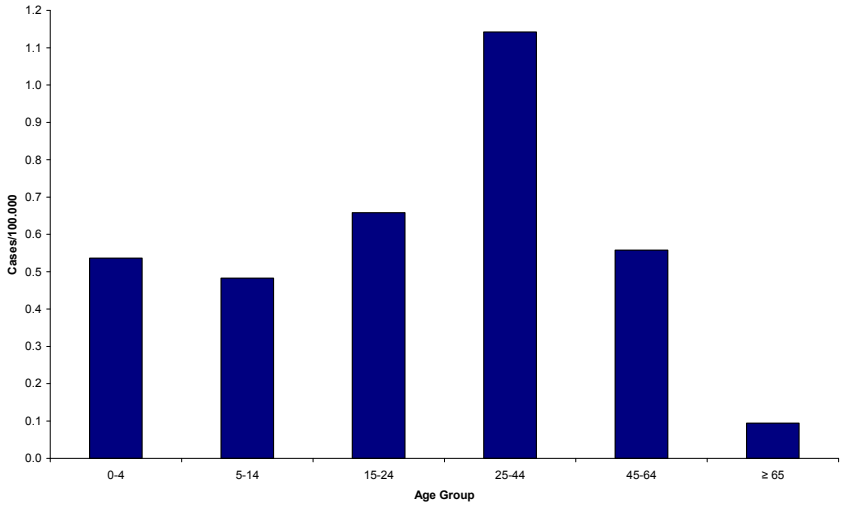
Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

It must be noted that the data from France, accounting for 36% of all reported cases over the previous 10 years in the EU, were not available for inclusion in this table.

Age and gender distribution

The highest incidence rate is among the 25–44 year-olds (1.14 per 100 000), followed by 15–24 year-olds (0.66 per 100 000) while the male to female ratio was 2:1.

Figure 4.23.2. Age-specific incidence distribution of malaria cases for selected European countries, 2005 (n = 1799)

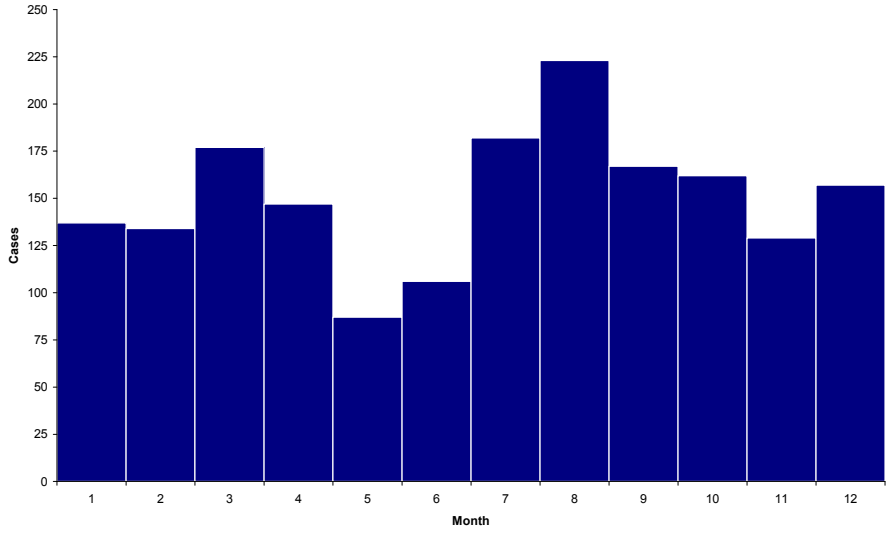


Source: Country reports. Reports with age-specific data were available from: Austria, Belgium, Cyprus, Czech Republic, Finland, Germany, Greece, Hungary, Ireland, Latvia, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden and Norway. Estonia and Iceland reported zero cases.

Seasonality

An increase in the number of reported cases can be seen in the summer months and in March, possibly related to travel patterns to endemic areas.

Figure 4.23.3. Distribution of malaria cases by month, for selected European countries, 2005 (n = 1 808)



Source: Country reports. Reports with seasonal data were available from: Austria, Belgium, Cyprus, Czech Republic, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom and Norway. Estonia and Iceland reported zero cases.

Conclusions

- Malaria is not a major public health problem in Europe. The rationale to continue surveillance for this disease is to ascertain that the prophylaxis recommendations are being followed effectively.
- That the trend of malaria cases in returning travellers is in decline despite the ever-growing numbers of Europeans travelling, suggests that travel prophylaxis recommendations are being applied with increasing success.
- Still, the risk for travellers to highly endemic areas remains significant.
- With around 4 000 imported malaria cases being diagnosed in Europe each year the risk to travellers remains significant.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Czech Republic	Surveillance System for Imported and Opportunistic Parasitic Infections	O	Se	P	C-B	Y	Y	N	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI - 7.3 (1)	C	Co	P	C-B	Y	N	N	N	Y

Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of notifiable diseases in Iceland	C	Co	P	A	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Malaria Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Malaria	O	Co	A	C-B	Y	Y	Y	Y	Y

4.24 Measles

Measles is an acute illness caused by an RNA virus of the genus *Morbillivirus*, a member of the family *Paramyxoviridae*. The disease is transmitted via airborne respiratory droplets, or by direct contact with nasal and throat secretions of infected individuals.

The main clinical picture is characterised by fever, rash, cough, coryza and conjunctivitis, appearing after an incubation period of 10 to 12 days. Complications are possible, including airway obstruction, pneumonitis, encephalitis and bacterial secondary infections. Only the latter require treatment, by the use of antibiotics.

The disease is preventable by a live-attenuated vaccine providing lifelong immunity to most recipients. The elimination of measles by 2010 (interruption of indigenous measles transmission) is part of the WHO strategic plan for measles and congenital rubella infection in the WHO European Region.

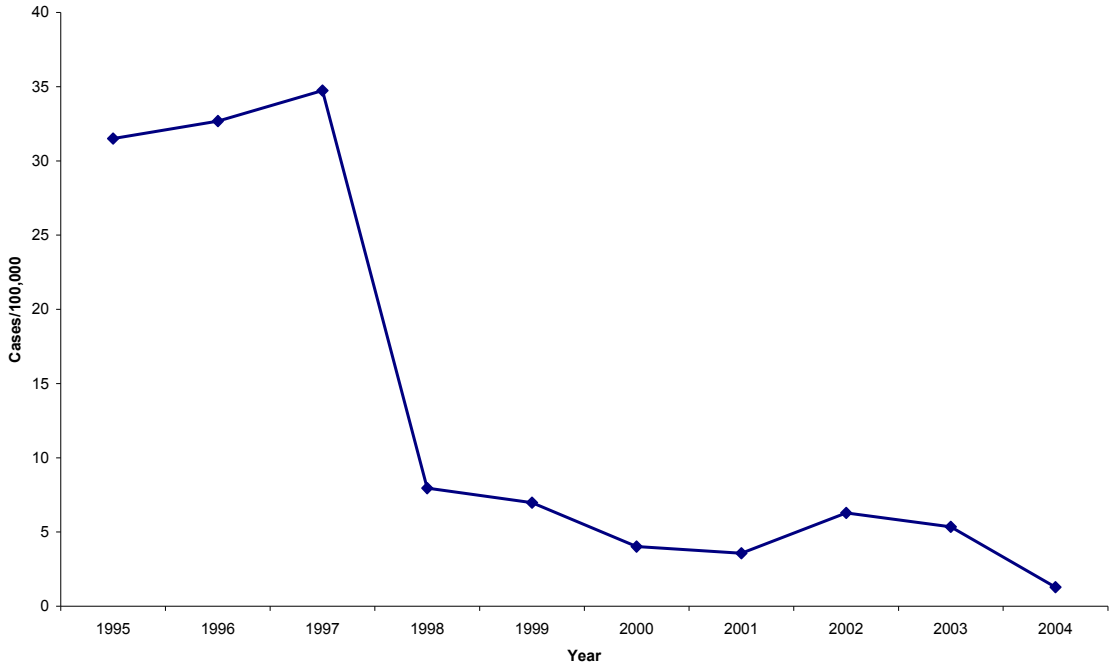
10-year trends

Complete data on the annual measles incidence are available for 23 of the EU25 and for two EEA/EFTA countries (Norway and Iceland). Data were available for only some of the years for Austria, Belgium, Germany and Slovenia, while Liechtenstein did not submit any reports.

The incidence of measles in Europe has decreased dramatically over the last 10 years from almost 35 per 100 000 before 1997 to less than 10 per 100 000 after 1998 (figure 4.24.1), possibly due to the two-dose vaccination policy in place in most countries.

This drop is mainly due to a sharp decrease in the number of cases in France and in Italy, but the incidence has decreased greatly in most of the countries over the 10-year period. A recrudescence of measles was observed in the Netherlands (1999–2000), Spain (2003), Poland (1998) and Lithuania (2002). Since 2000 a significant number of cases are still being observed in France, Germany and Italy. The crude incidence rates in these countries has fluctuated between five and 42 per 100 000. In the other countries, incidence has fluctuated between one and 10 per 100 000 since 2000.

Figure 4.24.1. Incidence rate of measles cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing for Liechtenstein.

Situation in 2005

In 2005, a total of 1 291 cases were reported by 26 countries, with more than 50% of cases (776) from Germany. The overall incidence in the EU was 0.28 per 100 000 and the highest rates were reported by Ireland (2.26 per 100 000) and Germany (0.94 per 100 000). Eradication has clearly not yet been achieved, with few countries able to maintain an incidence rate below one per 1 000 000 during the past few years.

Table 4.24.1. Number of measles cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	10	0.12
Belgium	C	26	0.25
Cyprus	C	1	0.13
Czech Republic	C	0	0.00
Denmark	C	2	0.04
Estonia	C	2	0.15
Finland	C	0	0.00
France**	C	9	0.01
Germany	C	776	0.94
Greece	C	31	0.28
Hungary	C	2	0.02
Ireland	C	93	2.26
Italy	C	214	0.37
Latvia	C	2	0.09
Lithuania	C	0	0.00
Luxembourg	C	0	0.00
Malta	C	2	0.50
Netherlands	C	3	0.02
Poland	C	1	0.00
Portugal	C	6	0.06
Slovakia	C	0	0.00
Slovenia	C	—	—
Spain	C	19	0.04
Sweden	C	13	0.14
United Kingdom	C	79	0.13
EU total		**1 291**	**0.28**
Iceland	C	0	0.00
Liechtenstein	—	—	—
Norway	C	0	0.00
Total		**1 291**	**0.28**

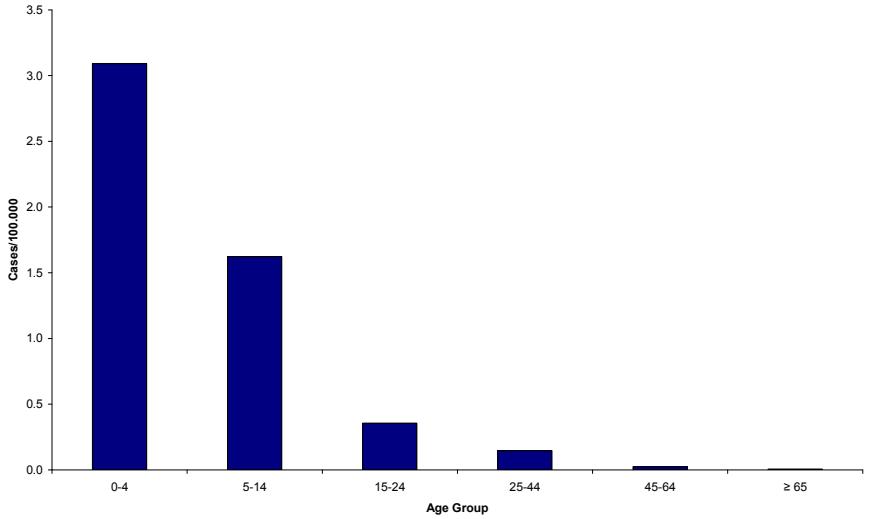
Source: Country reports. *C: Case-based report; —: No report.

** France introduced case-based reporting based on mandatory notification in July 2005 (22 cases, of which nine were confirmed).

Age and gender distribution

The highest incidence rate was reported in the age group 0–4 years (3.09 per 100 000) followed by the 5–14 year-olds (1.62 per 100 000), with the incidence decreasing rapidly with the age.

Figure 4.24.2. Age-specific incidence distribution of measles cases for selected European countries, 2005 (n = 1 251)



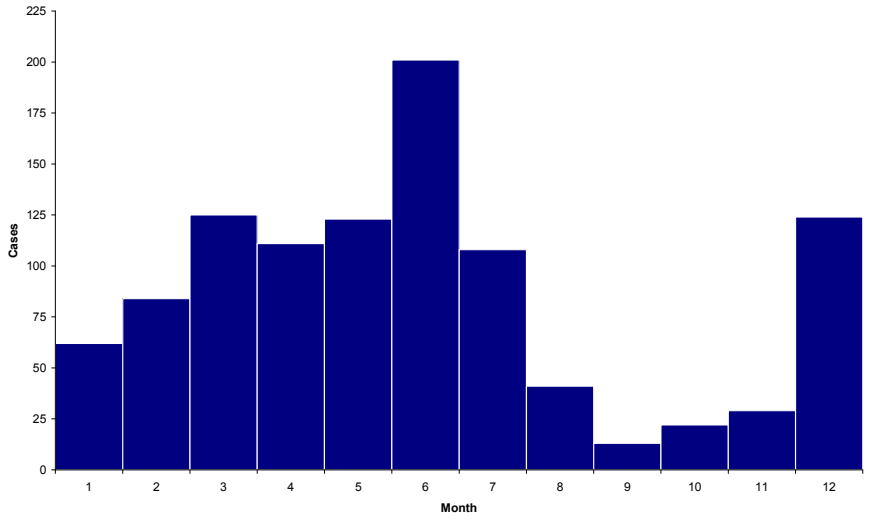
Source: Country reports. Reports with age-specific data were available from: Austria, Cyprus, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, Netherlands, Poland, Portugal, Slovenia, Spain and Sweden. Czech Republic, Lithuania, Luxembourg, Slovakia and Iceland reported zero cases.

Of the reports with data on gender, 53% (641) were male and 47% (574) were female.

Seasonality

Measles cases increase in spring, rising to a peak in June, followed by a rapid decrease during the autumn. The highest incidence would normally be expected in April/May but this observed June peak was due to an artefact in the German data (74% of the total). Many of the German cases were not initially reported by doctors but were detected by the local public health investigation of outbreaks. Therefore, the data included the date of the report of the case rather than that of the disease onset (figure 4.24.3).

Figure 4.24.3. Distribution of measles cases by month, for selected European countries, 2005 (n = 1 043)



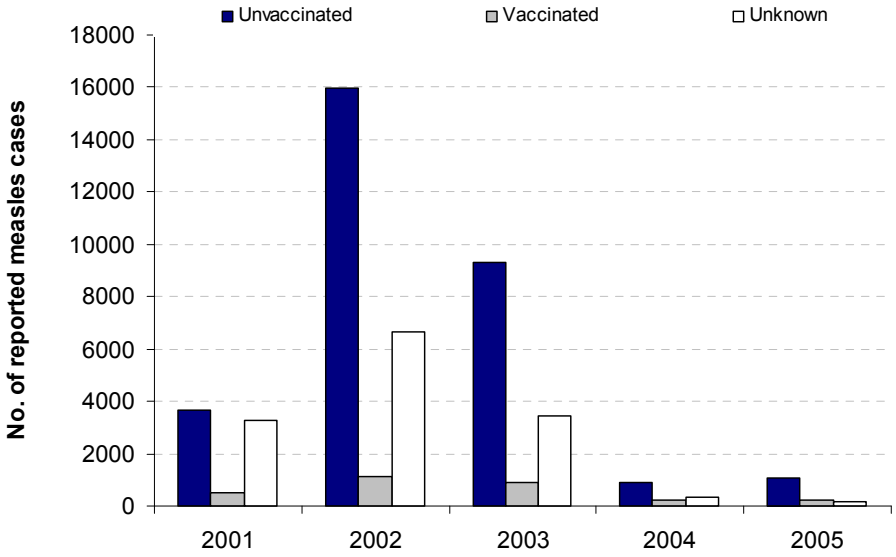
Source: Country reports. Reports with seasonal data were available from: Austria, Cyprus, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Latvia, Malta, Netherlands, Poland, Portugal, Spain, Sweden and United Kingdom. Czech Republic, Lithuania, Luxembourg, Slovakia and Iceland reported zero cases.

EUVAC.NET data

EUVAC.NET is a network created for the purposes of epidemiological surveillance and control of vaccine-preventable diseases in the European Community. The 19 participating countries are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Data collected over the last five years show that most of the measles cases reported in these countries occurred in unvaccinated members of the population (see figure 4.24.4).

Figure 4.24.4. Number of reported measles cases by vaccination status in 19 EUVAC.NET participating countries, 2001–05



Source: EUVAC.NET[1]. No data from Austria for 2001–02 and no data on vaccination status for 2002–03. Data from Belgium: French-speaking part only for 2001; no data for whole country for 2002; data on vaccination status available from 2003 onwards. Data from France available from mid-2005.

Conclusions

- The general trend of measles incidence shows a significant decrease all over Europe over the past 10 years, mainly due to the increased use of the two-dose vaccination policy.
- Elimination is not yet achieved and few countries were able to maintain an incidence rate below the target of 1 per 1 000 000 during the past few years.
- In 2005 the data is biased by the very high proportion of the data contributed by Germany, representing most of the cases.

References

1. http://www.euvac.net/graphics/euvac/index.html.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Pedisurv	V	Co	A	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Measles, Polio	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y

France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Sentinelles	V	Se	A	C-B	N	Y	N	N	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Greece	Sentinel	V	Se	P	A	N	Y	N	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	measles	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Measles surveillance system	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y

Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Measles	O	Co	P	C-B	Y	N	Y	Y	Y

4.25 Meningococcal disease

Meningococcal disease is caused by *Neisseria meningitidis*, a bacterium with human carriers as the only reservoir. It is carried in the nasopharynx, where it can remain for long periods without producing symptoms. Several serogroups are known, each with a different distribution worldwide.

Following exposure (inhalation of infective droplets) the carrier state may develop and last for some time. Due to a series of co-factors, a very low proportion of carriers (less than 1%) will eventually become ill. This most frequently occurs in young children, but a secondary peak in incidence is observed among adolescents and young adults.

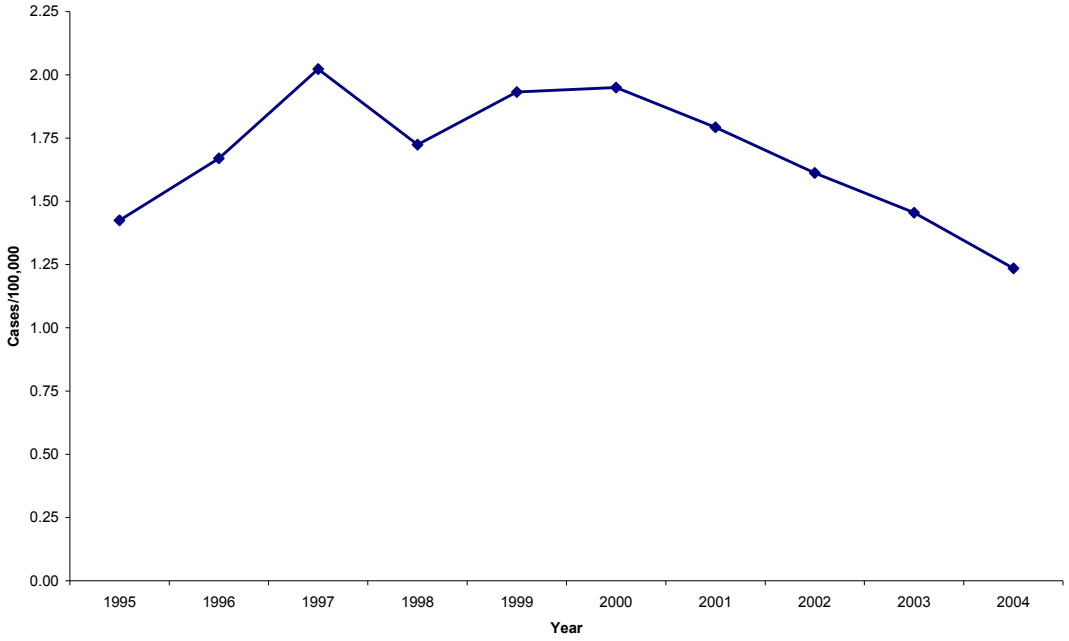
The clinical picture is very serious, and it may result in meningitis and septicaemia. Timely, appropriate antibiotic therapy can usually cure the meningitis (although serious complications including deafness, neurological problems and even amputations are still possible), whereas the septicaemia is lethal in about 8% of cases.

Vaccines are available against serogroups A, C, Y and W135. Most instances of the disease in Europe are caused by serogroups B and C. Since 1999, several countries have introduced vaccination programmes against serogroup C, using a new conjugate vaccine. To date, no vaccine is available against serogroup B.

10-year trends

Data on the annual meningococcal disease incidence were available for all the EU25 and for two EEA/EFTA countries (Norway and Iceland). Some of the country data refer solely to bacterial meningitis cases while others refer to all *N. meningitides* infections. Since 1999, countries that previously had a high incidence, such as Iceland and Ireland, show a sustained decrease possibly due to the introduction of the meningococcal C vaccine in high-risk populations. In the other countries, the reported incidence varied below two per 100 000 with stable trends or even with a slight decrease in the past few years after the introduction of the vaccine.

Figure 4.25.1. Incidence rate of invasive *Neisseria meningitidis* cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing for Liechtenstein.

Situation in 2005

In 2005, a total of 5 531 cases were reported by 27 countries. Ireland (with 4.94 per 100 000) and Malta (2.73 per 100 000) reported the highest incidence rates.

The overall incidence in Europe was 1.19 per 100 000.

Table 4.25.1. Number of invasive *Neisseria meningitidis* cases in the EU and EEA/EFTA, 2005

Country	Report type*	Confirmed cases	Incidence /100 000
Austria	C	106	1.29
Belgium	C	218	2.09
Cyprus	C	4	0.53
Czech Republic	C	97	0.95
Denmark	C	89	1.64
Estonia	C	13	0.97
Finland	C	37	0.71
France	C	685	1.10
Germany	C	626	0.76
Greece	C	191	1.72
Hungary	C	30	0.30
Ireland	C	203	4.94
Italy	C	366	0.63
Latvia	C	18	0.78
Lithuania	C	81	2.36
Luxembourg	C	4	0.88
Malta	C	11	2.73
Netherlands	C	251	1.54
Poland**	C	189	0.50
Portugal	C	136	1.29
Slovakia	C	45	0.84
Slovenia	C	15	0.75
Spain	C	923	2.14
Sweden	C	58	0.64
United Kingdom	C	1 091	1.82
EU total		**5 487**	**1.19**
Iceland	C	5	1.70
Liechtenstein	—	—	—
Norway	C	39	0.85
Total		**5 531**	**1.19**

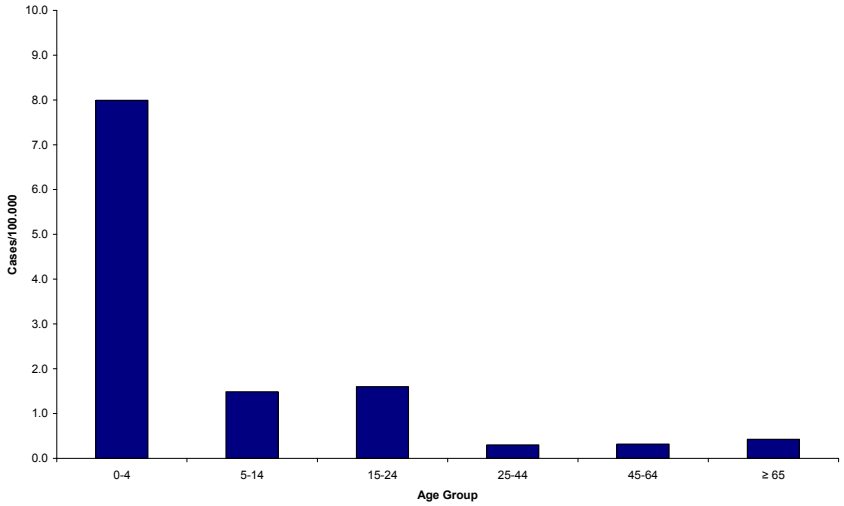
Source: Country reports. *C: Case-based report; —: No report.

**The data from Poland refer only to meningococcal meningitis.

Age and gender distribution

Among the reported cases with data on age, the highest incidence rate was reported among the 0–4 year-olds (7.99 per 100 000). The 15–24 year age group was the second most affected (1.60 per 100 000), followed by the 5–14 year-olds (1.49 per 100 000). The incidence rate drops significantly in the over 25s.

Figure 4.25.2. Age-specific incidence distribution of invasive *Neisseria meningitidis* cases for selected European countries, 2005 (n = 2 784)



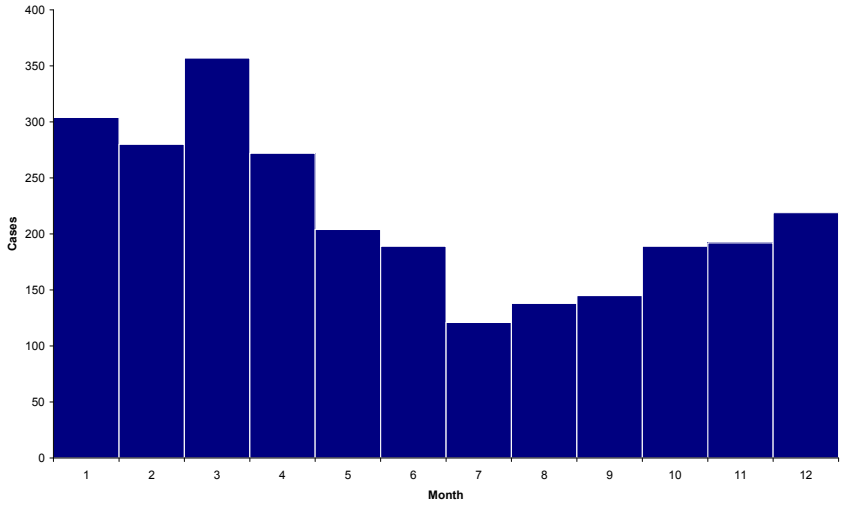
Source: Country reports. Reports with age-specific data were available from: Austria, Cyprus, Czech Republic, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, Netherlands, Portugal, Slovakia, Spain, Sweden, Iceland and Norway.

Of the 2 785 cases for which information on gender was available, 51% were male and 49% were female.

Seasonality

During 2005, the incidence was clearly much lower during the summer period, gradually rising to a peak in March.

Figure 4.25.3. Distribution of invasive *Neisseria meningitidis* cases by month, for selected European countries, 2005 (n = 2 610)



Source: Country reports. Reports with seasonal data were available from: Austria, Cyprus, Czech Republic, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Latvia, Malta, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, Iceland and Norway.

Conclusions

- The 10-year trend for most of the countries was stable or decreasing slowly.
- Young children and young adults were most affected by the disease, but there were no gender differences.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Czech Republic	Active surveillance of invasive meningococcal diasease	C	Co	A	C-B	Y	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Meningococc	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	EPIBAC, Community invasive infections	V	Se	A	C-B	Y	N	Y	N	Y

	hospitalized									
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	Hib and meningococcal surveillance	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	bacterial meningitis/septicaemia	V	Co	P	C-B	Y	N	N	N	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Meningococal Disease surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United	UK Meningococcal	O	Co	P	C-B	Y	N	Y	Y	Y

Kingdom	disease									

4.26 Mumps

Mumps is an acute illness caused by the mumps virus, a *Paramyxovirus*. It is characterised by fever and swelling of one or more salivary glands, typically the parotids (mumps is the only cause of epidemic infectious parotitis).

Humans are the only reservoirs of the virus, which is transmitted from person to person via droplets and/or saliva. Following infection, the incubation period lasts on average 16–18 days. Salivary glands apart, other organs may be involved and symptoms might include orchitis (in post-pubertal males), prostatitis, thyroiditis, and pancreatitis. Meningeal involvement is frequent, but mostly asymptomatic. Encephalitis is believed to occur in only one in 10 000 cases, but it has a high mortality (also due to the lack of specific treatment).

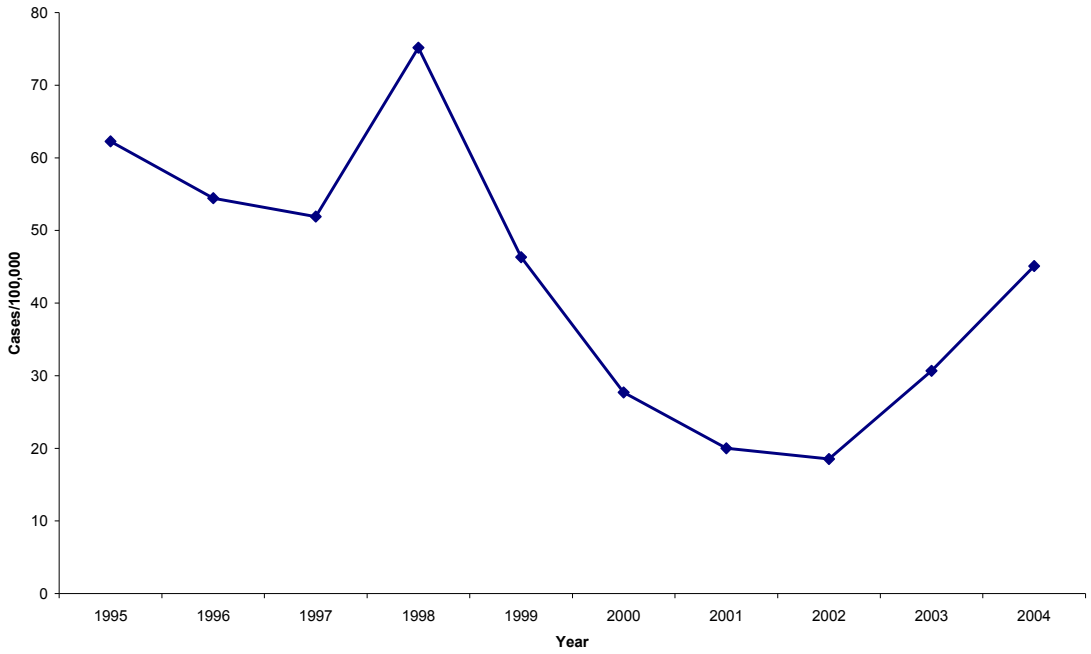
Mumps is preventable by a live-attenuated vaccine, which is most often administered in association with anti-rubella and anti-measles vaccines (MMR).

10-year trends

From 1995 to 2004, data were available for 23 EU Member States (no data from Austria or Germany) and two EEA/EFTA countries (Norway and Iceland) but only partial data from the Netherlands, Luxembourg and Belgium. The latest year for which the Netherlands has submitted data on mumps is 1999.

In the last 10 years, there was an overall decreasing trend until 2002, but since then the number of cases has been steadily increasing. Various countries experienced outbreak peaks in incidence over this 10-year period, notably Poland in 1998 and 2004, Estonia in 1998, France in 1995–96, Italy in 1995–96 and 1999–2000, Latvia in 2000–01, Lithuania in 1999, Malta in 2000, Ireland at the end of 2004, Portugal in 1996–97 and Spain in 1996 and 2000. (figure 4.26.1).

Figure 4.26.1. Incidence rate of mumps cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. No data available from Austria, Germany or Liechtenstein.

Situation in 2005

In 2005, a total of 52 918 cases were reported by 23 countries. United Kingdom, that experienced extended outbreaks of mumps in 2005, followed by Iceland, reported the highest incidence rates (77.24 and 28.95 per 100 000, respectively). The overall incidence for Europe was 17.65 per 100 000.

Table 4.26.1. Number of mumps cases in the EU and EEA/EFTA, 2005

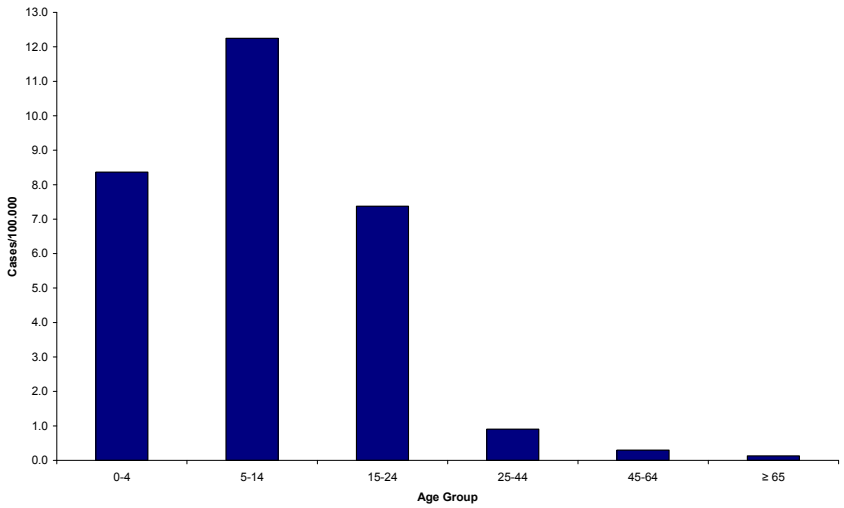
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	27	0.33
Belgium	C	70	0.67
Cyprus	C	5	0.67
Czech Republic	C	1 803	17.64
Denmark	C	11	0.20
Estonia	A	29	2.15
Finland	—	—	—
France	—	—	—
Germany	—	—	—
Greece	C	6	0.05
Hungary	C	11	0.11
Ireland	C	595	14.48
Italy	C	2 448	4.19
Latvia	C	5	0.22
Lithuania	C	101	2.95
Luxembourg	C	1	0.22
Malta	C	2	0.50
Netherlands	—	—	—
Poland	C	104	0.27
Portugal	C	25	0.24
Slovakia	C	10	0.19
Slovenia	C	5	0.25
Spain	C	1 113	2.59
Sweden	C	81	0.90
United Kingdom	C	46 373	77.24
EU total		**52 825**	**17.91**
Iceland	C	85	28.95
Liechtenstein	—	—	—
Norway	C	8	0.17
Total		**52 918**	**17.65**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

Age and gender distribution

Children and adolescents were the most affected by mumps. The age group 5–14 years had the highest incidence of 12.25 per 100 000, followed by 0–4 year-olds with 8.36 per 100 000. The rates declined steadily with age (figure 4.26.2).

Figure 4.26.2. Age-specific incidence distribution of mumps cases for selected European countries, 2005 (n = 5 375)



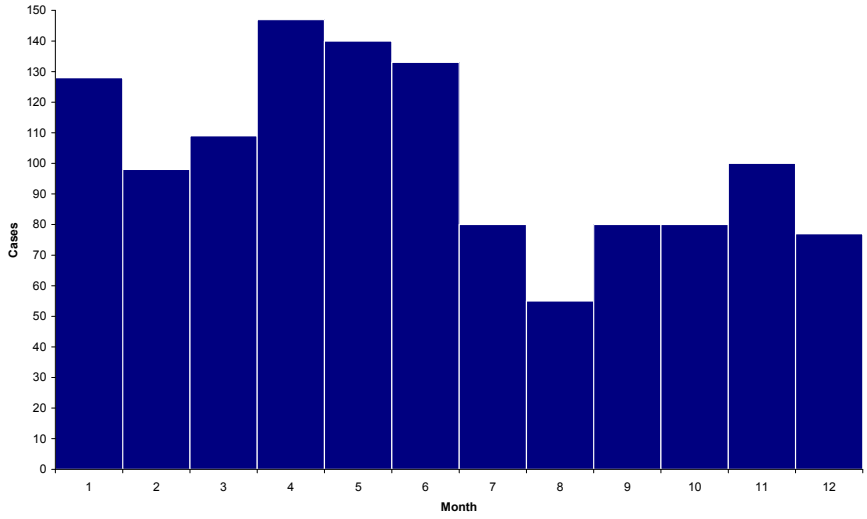
Source: Country reports. Reports with age-specific data were available from: Austria, Cyprus, Czech Republic, Denmark, Estonia, Greece, Hungary, Ireland, Italy, Malta, Portugal, Slovakia, Spain, Sweden, Iceland and Norway.

Of the 5 341 cases from 16 countries for which the information on gender was available, 61% (3 266) were male and 39% (2 075) were female.

Seasonality

In 2005, the overall incidence appeared to be highest in the spring. The frequency was lowest in the summer and then rose to a second peak in January (figure 4.26.3).

Figure 4.26.3. Distribution of mumps cases by month, for selected European countries, 2005 (n = 1 227)



Source: Country reports. Reports with seasonal data were available from: Cyprus, Denmark, Estonia, Greece, Hungary, Ireland, Malta, Poland, Portugal, Slovakia, Spain, Sweden, Iceland and Norway.

Conclusions

- The trend of mumps infection at European level is clearly rising, although there are some issues concerning data incompatibility. In 2005 in particular, United Kingdom and also Ireland experienced a very high incidence of mumps due to large outbreaks.
- Mumps shows a tendency for higher transmission during the spring and winter, and remains mainly a disease of children and young adults.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria										
Belgium	Pedisurv	V	Co	A	C-B	Y	Y	Y	Y	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide Mumps	C	Co	P	A	N	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Sentinelles	V	Se	A	C-B	N	Y	N	N	Y
Germany										
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Greece	Sentinel	V	Se	P	A	N	Y	N	N	Y
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	other VPD EU case definitions	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based	C	Co	P	C-B	Y	N	N	N	Y

	surveillance system									
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Mumps Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Mumps	O	Ot	A	C-B	Y	N	Y	Y	Y

4.27 Pertussis

Pertussis is an acute bacterial infection of the respiratory tract caused by the bacterium *Bordetella pertussis*. The disease is characterised by an irritant, paroxysmal cough, lasting for two months or even longer.

Humans are the only reservoir. Healthy carriers probably do not exist, but infected adults are usually scarcely symptomatic and can shed bacteria for weeks. Following infection (by inhalation of droplets), susceptible individuals develop symptoms after an incubation period of about 10 days. The typical paroxysmal cough is usually seen in young children. Babies less than six months old do not cough, but they manifest dyspnea and paroxysmal asphyxia and are the most likely to die of the disease unless they receive suitable treatment.

Affected children are also exposed to complications such as pneumonia, atelectasia, weight loss, hernia, seizures, encephalopathy (probably due to hypoxia). Antibiotics may reduce the duration of the disease, especially if administered in its early stages.

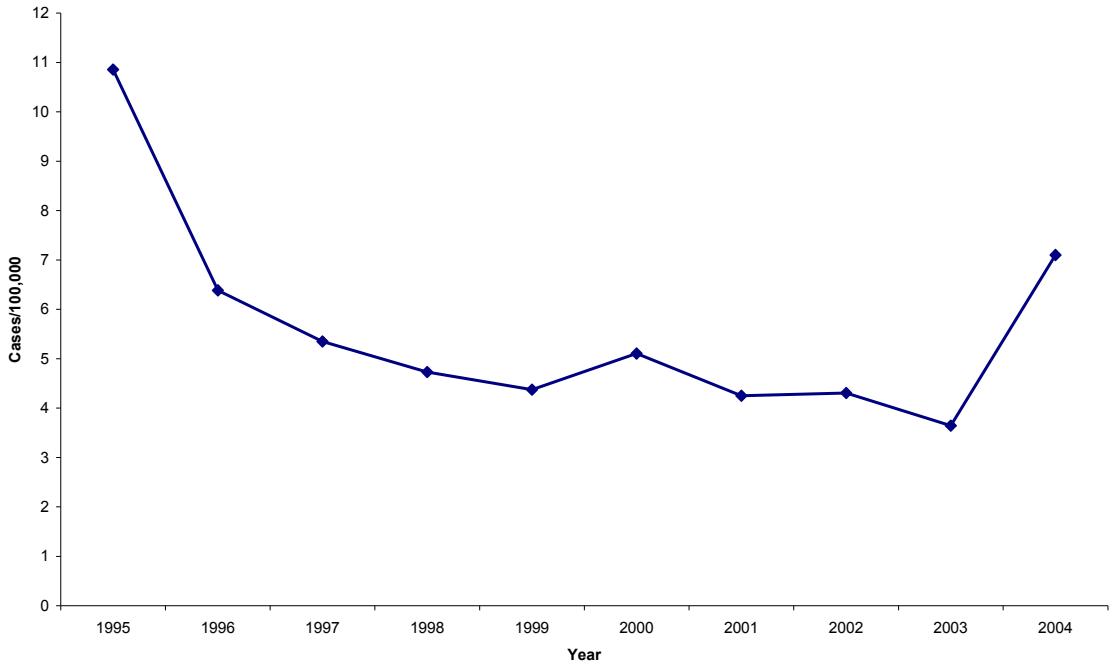
To protect children, effective vaccines are available, to be administered very early on after birth.

10-year trends

For the period 1995 to 2004, data are available for all the 25 EU Member States and two EEA/EFTA countries (Norway and Iceland) for the whole of this period, apart from Germany (data missing for 1995–96 and 2003–04) and one year's data missing for France (1995), Luxembourg (2004) and Slovenia (2001). Liechtenstein did not submit any data.

In the last 10 years, the overall trend showed a decline, apart from 2004 (figure 4.27.1). An overall decrease was observed between 1995 and 2000, but after 2002, several countries are showing increasing trends (Czech Republic, Finland, Hungary, Poland, Spain, Norway). An overall higher incidence has been observed in the northern European countries: Estonia, Finland, the Netherlands, Norway and Sweden. A dramatic decrease was observed in Sweden at the beginning of this period and in United Kingdom and Ireland over the whole period. For the other countries, the incidence was low.

Figure 4.27.1. Incidence rate of pertussis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing for Liechtenstein.

Situation in 2005

In 2005, a total of 13 207 cases were reported by 24 countries. The highest rate by far was reported by the Netherlands (40.17 per 100 000), followed by Norway reporting a rate of 19.10 per 100 000. The overall incidence rate in the EU was 4.10 per 100 000.

Table 4.27.1. Number of pertussis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	136	1.66
Belgium	C	169	1.62
Cyprus	C	6	0.80
Czech Republic	C	412	4.03
Denmark	C	129	2.38
Estonia	A	63	4.68
Finland	—	—	—
France	—	—	—
Germany	—	—	—
Greece	C	5	0.03
Hungary	C	21	0.21
Ireland	C	83	2.02
Italy	C	801	1.37
Latvia	C	15	0.65
Lithuania	C	64	1.87
Luxembourg	C	0	0.00
Malta	C	3	0.74
Netherlands	C	6 550	40.17
Poland	C	1 608	4.21
Portugal	C	75	0.71
Slovakia	C	17	0.32
Slovenia	C	76	3.80
Spain	C	370	0.86
Sweden	C	1 360	15.09
United Kingdom	C	358	0.60
EU total		**12 321**	**3.96**
Iceland	C	6	2.04
Liechtenstein	—	—	—
Norway**	C	880	19.10
Total		**13 207**	**4.18**

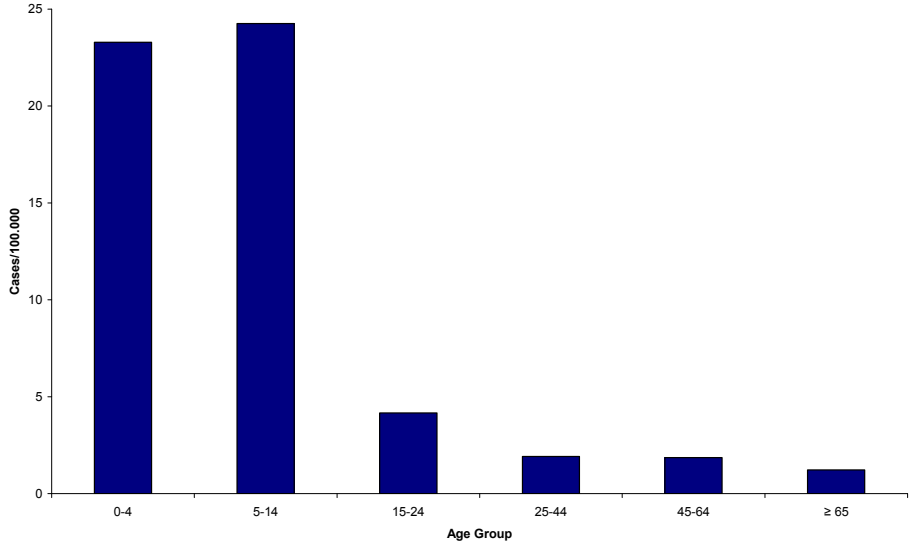
Source: Country reports. *A: Aggregated report; C: Case-based report;—: No report.

**Data from Norway refer to children less than 10 years of age only.

Age and gender distribution

In 2005, the distribution by age group of pertussis cases is heavily influenced by the high proportion of cases reported by the Netherlands (61%). Children less than 15 years old are the ones mostly affected, representing 68% of the number of reported cases. The incidence was highest in the 5–14 year-olds (24.25 per 100 000) followed by 0–4 year olds (23.29 per 100 000), with the incidence decreasing significantly after 15 years of age. That pattern is similar across all reporting countries.

Figure 4.27.2. Age-specific incidence distribution of pertussis cases for selected European countries, 2005 (n = 10 750)



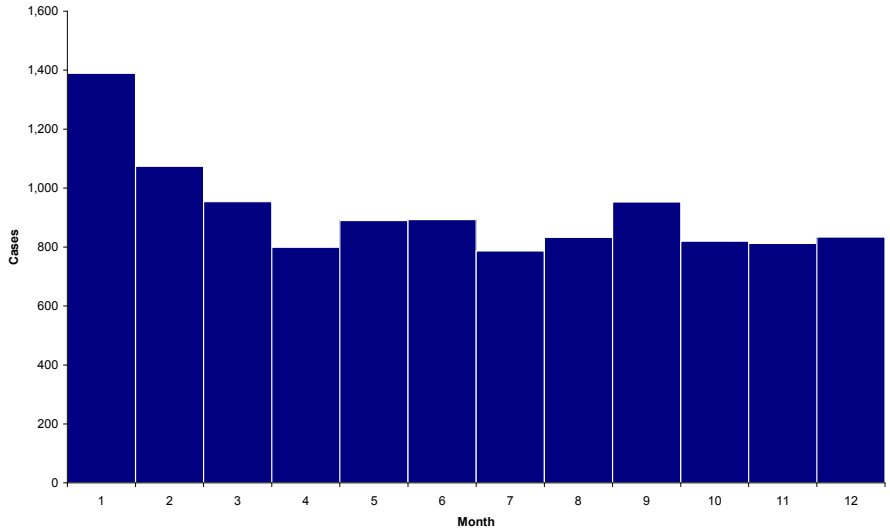
Source: Country reports. Reports with age-specific data were available from: Belgium, Cyprus, Czech Republic, Denmark, Estonia, Greece, Hungary, Ireland, Italy, Malta, Netherlands, Portugal, Spain, Sweden, Iceland and Norway.

Amongst the confirmed cases with information on gender (n = 10637), 45% (4 790 cases) were male and 55% (5 847 cases) were female.

Seasonality

For 2005, no marked seasonality is visible, except for a slightly higher rate in January. This seasonal data is greatly influenced by the high number of cases notified by the Netherlands (59%).

Figure 4.27.3. Distribution of pertussis cases by month, for selected European countries, 2005 (n = 11 038)

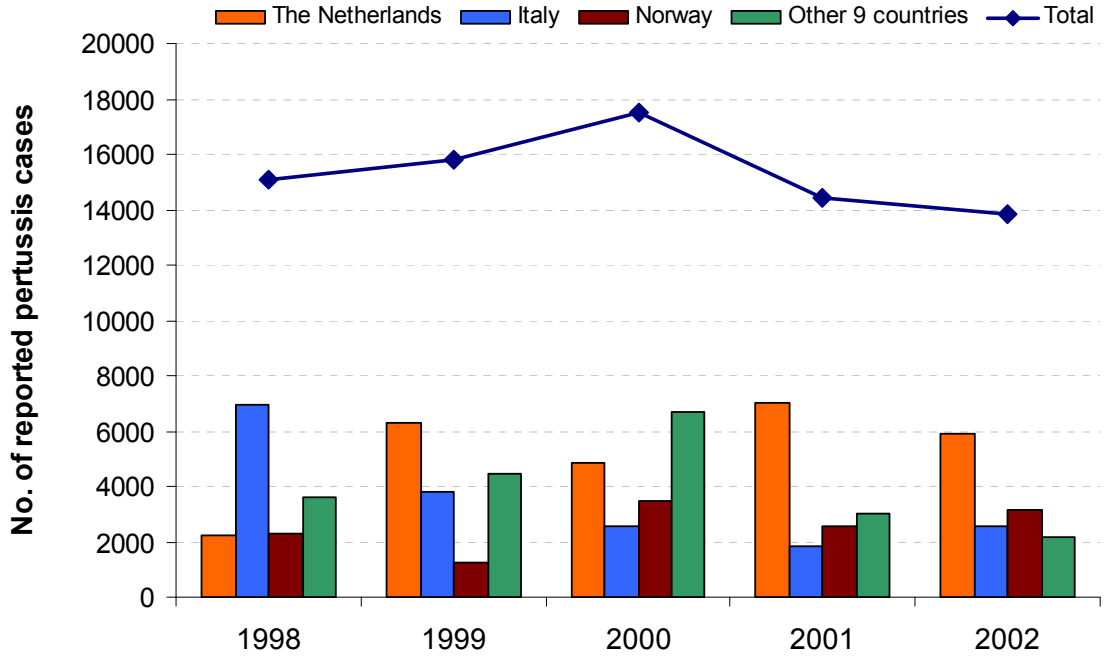


Source: Country reports. Reports with seasonal data were available from: Austria, Cyprus, Denmark, Estonia, Greece, Hungary, Ireland, Malta, Netherlands, Poland, Portugal, Spain, Sweden, Iceland and Norway.

EUVAC.NET data

Data collected over the five-year period 1989–2002 shows a stable trend in the occurrence of pertussis[1]. However, a number of countries such as the Netherlands and Italy have reported large outbreaks during this period, contributing significantly to the European total (figure 4.27.4).

Figure 4.27.4. Number of pertussis cases in the EUVAC.NET-participating countries 1998–2002



Source: EUVAC.NET. Data from Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Malta, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom. No data from Spain or Sweden for 2002. Denmark provided data only on population 0–2 years of age. Only data from the former East Germany were available for this period.

Conclusions

- Pertussis, although known to be preventable by the vaccine, still affects several European countries, in some cases quite significantly, suggesting insufficient vaccine coverage in some susceptible populations.
- The youngest age groups remain the most affected by this infection.
- The possibility of under-reporting in the older age group, most likely due to under-diagnosis or misdiagnosis, is well described in the literature.
- Closer monitoring in all EU countries is needed to better assess the real burden and risks of transmission of pertussis in order to improve prevention and control measures.

References

1. http://www.euvac.net/graphics/euvac/trends_pertussis.html

Surveillance systems overview

Country	System	Compulsory/ Voluntar	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by	National Coverage

						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Pertussis, Shigellosis, Syphilis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Renacoq : surveillance of pertussis among children	V	Se	P	C-B	Y	Y	Y	N	Y
Germany										
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Greece	Sentinel	V	Se	P	A	N	Y	N	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	other VPD EU case definitions	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembou	System 1	C	Co	P	C-B	N	Y	N	N	Y

rg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Pertussis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Pertussis	O	Co	P	C-B	Y	N	Y	Y	Y

4.28 Plague

Plague is caused by *Yersinia pestis* bacteria. Haematophagous insect (flea) bites transmit it among animals and various species of rodents can become infected. Human cases are most likely to occur when domestic rats are involved, as these live in close proximity to humans. Sporadic human cases appear after exposure to rodents and/or their ecto-parasites (bubonic plague). In cases of primary pulmonary plague, patients become infected by inhaling bacteria-rich aerosols produced by individuals who developed secondary pneumonia in the course of plague septicaemia.

Following a short incubation period (one to seven days) the patient develops a high fever and a septic state, with a very high mortality rate, which remains substantial even if appropriate antibiotic therapy is administered. If the patient survives, bubonic plague is characterised by swelling of regional lymphnodes (bubos), which later colliquate, and then the patient usually goes on to recover.

Plague prevention is based on general environmental hygiene, with special regards to waste disposal and control of domestic rats.

Data and trends

Although between 1989 and 2003, 38 310 (2 845 deaths, case fatality rate = 7.4%) were reported to WHO by 25 countries in Africa, Asia and the Americas, no cases were reported from Europe[1]. This disease, therefore, only remains a concern mainly for travellers.

The great majority of the global burden of cases were reported in Africa, especially the Congo RDC, Madagascar, Tanzania and Malawi. The remaining cases are essentially reported from Asia (China, Mongolia, India) and the Americas (Peru and the USA). Recent outbreaks have shown that the disease may re-emerge in areas that had long remained apparently un-affected. This happened in India (1994, 2002), Indonesia (1997) and Algeria (2003).

Conclusions

- In Europe no human plague cases have been reported for a long time. Given the severity of the disease and its clinical characteristics, it is unlikely that cases have been missed.
- Though relatively rare, the disease has a worldwide distribution and, in recent years, increasing numbers of cases are being reported to WHO.
- The only implications of plague for the European health systems refer to the counselling of international travellers and maintaining awareness of clinicians who might have to treat travellers upon their return.

References

1. Weekly Epidemiological Record, Vol. 79, 33, 2004.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N

Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Hemorrhagic fevers	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y

Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Plague Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Plague	O	Co	P	C-B	Y	N	Y	Y	Y

4.29 Invasive pneumococcal disease (IPD)

Despite good access to effective antibiotics, *Streptococcus pneumoniae* (pneumococcus) is still a major cause of morbidity and mortality in both developing and developed countries. Pneumococci are the main cause of bacterial respiratory tract pathology, such as pneumonia, acute otitis media (AOM), and sinusitis, in all age groups. The youngest and the elderly, are those most exposed to invasive pneumococcal infections, such as sepsis, meningitis and pneumonia. Asymptomatic carriage of pneumococci in the nasopharynx of young children is common.

Based on the structure and antigenic properties of capsular polysaccharides, pneumococci are classified into some 90 serotypes, which differ in their immunogenicity. Children under five years of age lack the ability to mount an adequate antibody response to several of them (e.g. 6B, 9V, 14, 19F, and 23F), resulting in infections being more common in this age group (hence the term 'child serotypes').

Pneumococcal vaccines based on capsular polysaccharides are now registered throughout the world. They protect against invasive pneumococcal disease in adults (their efficacy against non-invasive pneumococcal pneumonia is less certain). Such vaccines, instead, have little effect in children under five years of age and do not prevent the asymptomatic carriage of *Streptococcus pneumoniae*.

A new generation of vaccines where the capsular polysaccharide is coupled (conjugated) to a protein appears to be highly efficient against invasive disease and it also prevents nasopharyngeal carriage. These vaccines ('7-valent conjugated vaccines' or PCV7) contain polysaccharides from the serotypes commonly seen in childhood invasive disease and also those associated with antimicrobial resistance.

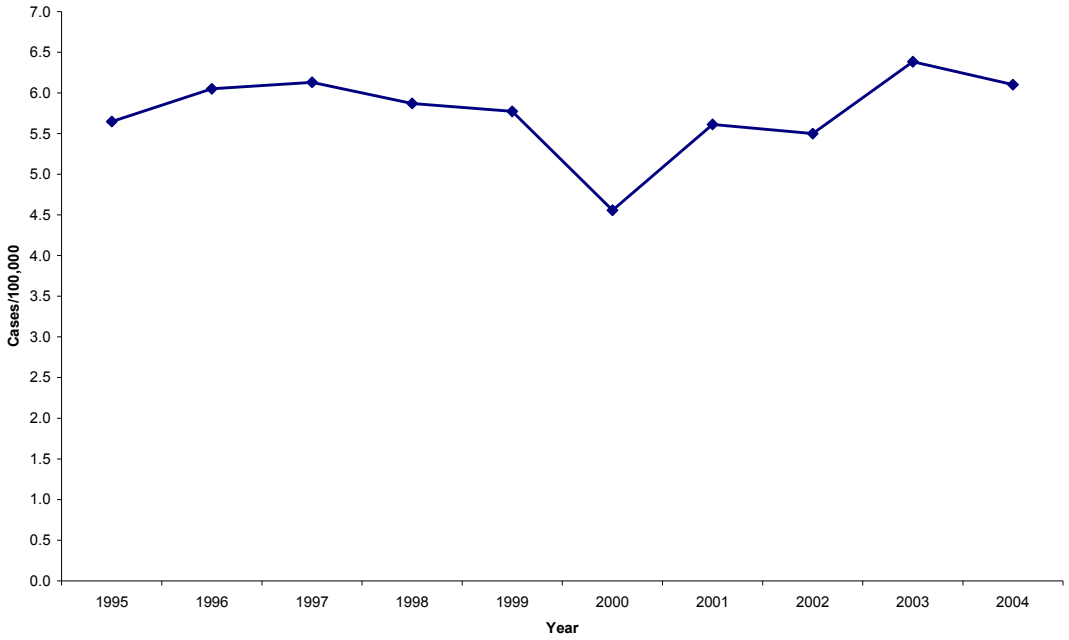
10-year trends

Data for the entire decade were available only for nine EU Member States (Belgium, Czech Republic, Denmark, Finland, France, Italy, Slovakia, Spain, United Kingdom) and Norway. Austria, Germany, Hungary, Ireland, Netherlands, Slovenia and Sweden provided data for at least part of the period. Some of the country data refer only to pneumococcal meningitis, while other country's data use a broader interpretation of invasive pneumococcal disease cases.

The overall trend of invasive pneumococcal infections over the last 10 years was stable in most countries, with the exception of Denmark (declining) and the UK, Belgium, Slovakia and France (increasing).

Due to differences in the surveillance systems of invasive bacterial infections, these figures should be treated with caution, especially when comparing between the countries[1]. Perceived differences in rates could reflect both sampling rates[2], and whether cases with asymptomatic bacteraemia have been included. In the latter case, the rates may be up to 50% higher than if only the symptomatic cases were included in the data.

Figure 4.29.1. Incidence rate of invasive pneumococcal disease cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. No data at all from Cyprus, Estonia, Greece, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Iceland and Liechtenstein.

Rates presented for Ireland for the period1997–2001 relate only to pneumococcal meningitis.

Situation in 2005

In 2005, a total of 19 665 invasive pneumococcal infections (5.83 per 100 000) were reported by 19 countries. Sweden (15.76 per 100 000) followed by Belgium (15.45 per 100 000) reported the highest incidence rates.

The estimated crude incidence rate in Europe was 5.83 per 100 000. Very large discrepancies in notification were observed across countries, so these data and any subsequent analyses should be interpreted with caution.

Table 4.29.1. Number of invasive pneumococcal disease cases in the EU and EEA/EFTA, 2005

Country	Report type*	Confirmed cases	Incidence /100 000
Austria	C	144	1.75
Belgium	C	1 614	15.45
Cyprus	C	8	1.07
Czech Republic	C	57	0.56
Denmark	C	109	2.01
Estonia	C	28	2.08
Finland	—	—	—
France	C	6 214	9.96
Germany	—	—	—
Greece	—	—	—
Hungary	C	60	0.59
Ireland	C	257	6.25
Italy	C	291	0.50
Latvia	—	—	—
Lithuania	C	36	1.05
Luxembourg	—	—	—
Malta	C	7	1.74
Netherlands	—	—	—
Poland	C	160	0.42
Portugal	—	—	—
Slovakia	C	31	0.58
Slovenia	C	44	2.20
Spain	C	955	2.22
Sweden	C	1 420	15.76
United Kingdom	C	7 145	11.90
EU total		**18 580**	**5.58**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	C	1 085	23.55
Total		**19 665**	**5.83**

Source: Country reports. *C: Case-based report; —: No report.

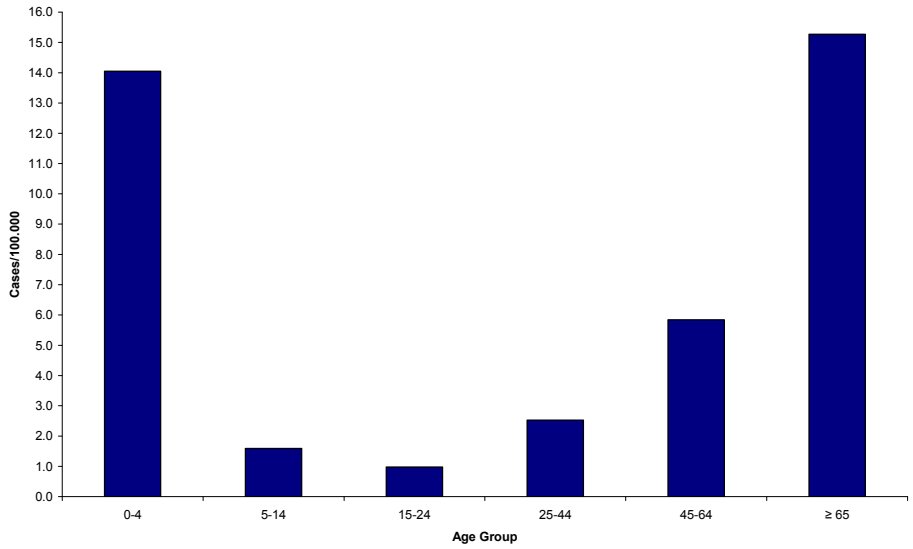
Age and gender distribution

Data on age distribution were available for 5 571 cases, but these were mainly provided by Norway, Sweden and Belgium (in all contributing 74%). Incidence rates were highest in the over 65 year-olds (15.27 per 100 000) and in children under four years (14.05 per 100 000), while the incidence rate between ages five and 64 years remained low but clearly increased with age.

This same age distribution has previously been described in published surveys, and could be attributed to an immature immunity in the very young, and waning immunity coupled with concomitant diseases (cardiopulmonary disease, diabetes, malignancies) in the elderly. The impact of the 23-valent pneumococcal polysaccharide vaccine has recently been assessed by an ECDC scientific panel[3].

Among the 3 992 cases reported with information on gender, 53% were male (2 133 cases) and 47% were female (1 859 cases).

Figure 4.29.2. Age-specific incidence distribution of invasive pneumococcal disease cases for selected European countries, 2005 (n = 5 571)

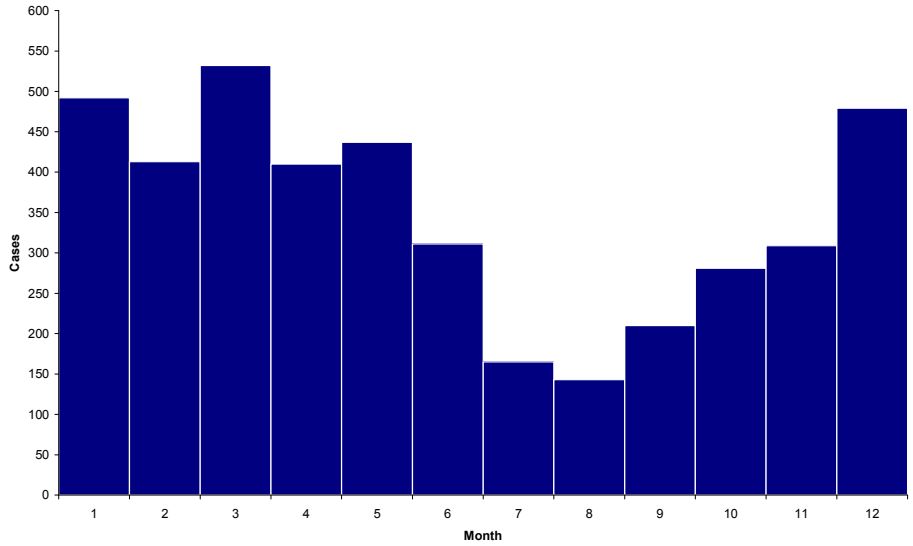


Source: Country reports. Reports with age-specific data were available from: Austria, Belgium, Cyprus, Denmark, Estonia, Hungary, Ireland, Malta, Spain, Sweden and Norway.

Seasonality

The seasonality trends of invasive pneumococcal disease were marked, with the lowest incidence in summer time, from July to September, and a rapid increase as the winter approaches reaching a peak in the months December to March, following the familiar seasonal pattern for most other respiratory tract infections.

Figure 4.29.3. Distribution of invasive pneumococcal disease cases by month, for selected European countries, 2005 (n = 4182)



Source: Country reports. Reports with seasonal data were available from: Austria, Cyprus, Denmark, Estonia, Hungary, Ireland, Malta, Poland, Spain, Sweden and Norway.

Serotype distribution and vaccination policies

A dramatic decrease in the incidence of childhood invasive pneumococcal disease was reported in the United States after the introduction of PCV7 to the childhood immunisation programme in 2000. In the EU, the vaccine was registered in early 2001 and 12 European countries have now introduced PCV7 as a universal vaccine in the childhood vaccination schemes, and several others recommend it for at-risk children[4]. The present vaccine composition (serotypes 4, 6B, 9V, 14, 18C, 19F, and 23F) has been designed from American sero-epidemiological surveys, where this combination covers 85% of the serotypes seen in invasive disease[5]. As serotype distribution varies over time and geography[6], there have been concerns that the PCV7 would be less suited for the serotype distribution in Europe. There is no European surveillance of serotypes, but a recent Cochrane review of published literature, including 11 556 European invasive isolates from persons below the age of 18 years showed that 8 705 isolates (75%) were due to serotypes included in the PCV7, i.e. considerably lower than in the United States. With the increased use of PCV7, this figure may also be affected by a replacement of non-vaccine serotypes in the population[7]. Therefore, surveillance of both invasive childhood disease and of serotype distribution will be increasingly important in the coming years.

Conclusions

- National surveillance systems for invasive pneumococcal infections are not implemented in several European countries, and where these are present, they do not provide comparable European data.
- Denominator data on a number of cultures would provide better estimates for comparison.
- The trend of this disease appears to be stable.
- The high incidence in the younger and older populations could probably be tackled through immunisation.
- With the introduction of conjugated pneumococcal vaccines in the child immunisation programmes in many countries, surveillance of invasive pneumococcal disease and serotype distribution will become increasingly important.

References

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	Obligatory, countrywide, based on a double system of reporting Pneumococc	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	EPIBAC, Community invasive infections hospitalized	V	Se	A	C-B	Y	N	Y	N	Y
France	Observatoires Régionaux du Pneumocoque (ORP)	V	Co	A	C-B	Y	N	N	N	Y
Germany										
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary										
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	ARISS	V	Se	P	C-B	Y	N	N	N	N
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y

Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	bacterial meningitis/septicaemia	V	Co	P	C-B	Y	N	N	N	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Pneumococcal infections	O	Co	P	C-B	Y	N	Y	Y	Y

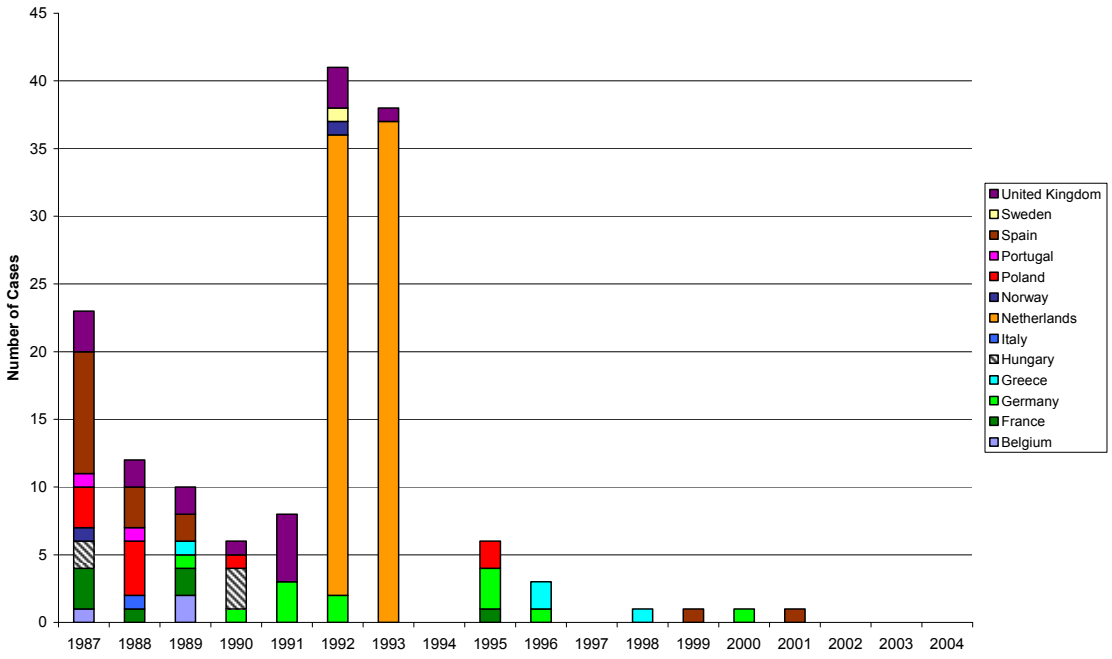
4.30 Poliomyelitis

Polioviruses, classified into types 1, 2 and 3, belong to the genus *Enterovirus* . Humans are the only reservoir of infection: the poliovirus is found in the bowel and in the pharynx of infected individuals. Transmission occurs via the oral-faecal route or contact with saliva.

Most infections remain completely asymptomatic, while 10% of cases develop mild symptoms only, such as fever, malaise, nausea, and vomiting. However, after exposure and an incubation period of about one to two weeks (usually) the virus can spread from the gastrointestinal tract to the central nervous system, resulting in meningitis and neural damage with paralyses (the latter in less than 1% of cases). No specific therapy is available against the virus.

Childhood immunisation programmes with trivalent live, attenuated oral poliovirus vaccine (OPV) or with inactivated, injectable poliovirus vaccine (IPV) has been very effective: on the European continent, the last case of flaccid paralysis caused by wild polio was reported from Turkey in November 1998. In June 2002, the European region (based on the WHO Regions) was declared polio free. Since the virus is still present in other parts of the world, importation of cases remains possible and travellers to endemic areas should be adequately counselled.

Figure 4.30.1. Number of poliomyelitis cases by year for selected European countries, 1987–2004



Source: Eurostat.

Situation in 2005

No cases were reported in the EU25 or the EEA/EFTA countries.

Conclusions

- Europe remains polio-free thanks to effective national polio vaccination programmes.
- Poliovirus imported from poliomyelitis-endemic countries remains a threat. One example of this was the 1992–93 outbreak of 71 cases with two deaths in an unvaccinated community in the Netherlands which could be traced to imported cases.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Measles, Polio	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany										
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y

Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Acute Polimyelitis Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Polimyelitis	O	Co	P	C-B	Y	N	Y	Y	Y

4.31 Q fever

Q fever is a common zoonosis caused by *Coxiella burnetii* (*Rickettsiaceae*). Natural reservoirs include several domestic and wild animals, most of which show no signs of disease (although infection can cause abortions). Due to the pathogen's high resilience in the environment, humans are most often infected by inhalation of aerosols produced in contaminated locations, but other modes of infection have been documented (including food-borne).

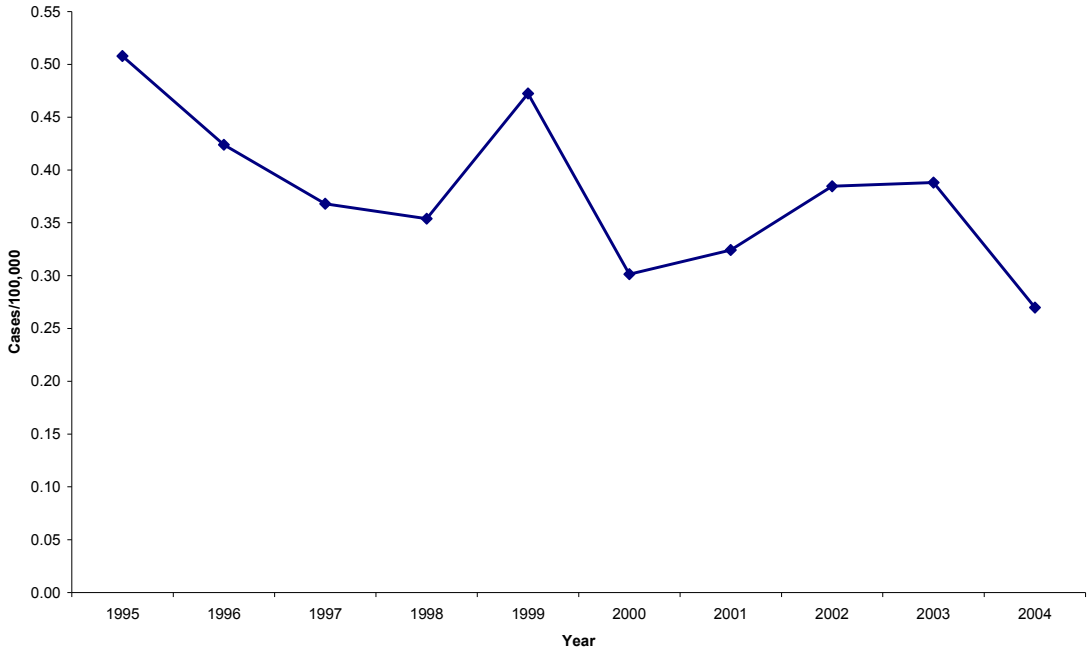
After an incubation period of, usually, 2–3 weeks, disease symptoms may appear but more frequently they do not. A serious clinical picture can suddenly emerge characterised by high fever, conjunctivitis, severe headache and obnubilation. X-rays may show interstitial pneumonitis. Occasionally, the infection takes a chronic course, leading to endocarditis, hepatitis and other organ pathology. Acute cases respond to appropriate antibiotic treatment but endocarditis may require surgery.

The mainstays of prevention aim at avoiding the production and inhalation of contaminated dust and the ingestion of potentially contaminated food (e.g. un-pasteurised milk).

10-year trends

The data on reported Q fever cases and incidence between 1995 and 2004 are incomplete and do not really allow for comparing trends between different countries, nor to provide an overall EU picture. Only 14 countries provided complete data for the whole period. Further, this is a typically under-reported disease due to its non-specific clinical features. Nevertheless, the overall trend appears to be rather stable with the rate varying between 0.2 and 0.5 cases per 100 000.

Figure 4.31.1. Incidence rate of Q fever cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein. Q fever is not a notifiable disease in Austria. Q fever was not notifiable in Ireland prior to 2004.

The situation in 2005

In 2005, 958 cases were reported by 21 countries. Germany and France reported the highest incidence rates (0.49 per 100 000 and 0.48 per 100 000, respectively) and were also responsible for

73.8% of all the cases reported in that year. The estimated overall incidence rate for Europe was 0.25 per 100 000.

Table 4.31.1. Number of Q fever cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria**	—	—	—
Belgium	C	10	0.10
Cyprus	C	0	0.00
Czech Republic	C	1	0.01
Denmark	—	—	—
Estonia	C	0	0.00
Finland	—	—	—
France	C	299	0.48
Germany	C	408	0.49
Greece	C	1	0.01
Hungary	C	13	0.13
Ireland	C	10	0.24
Italy	—	—	—
Latvia	C	0	0.00
Lithuania	C	0	0.00
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands	C	5	0.03
Poland	C	40	0.10
Portugal	C	6	0.06
Slovakia	C	0	0.00
Slovenia	C	3	0.15
Spain	C	134	0.31
Sweden	C	3	0.03
United Kingdom	C	25	0.04
EU total		**958**	**0.25**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	—	—	—
Total		**958**	**0.25**

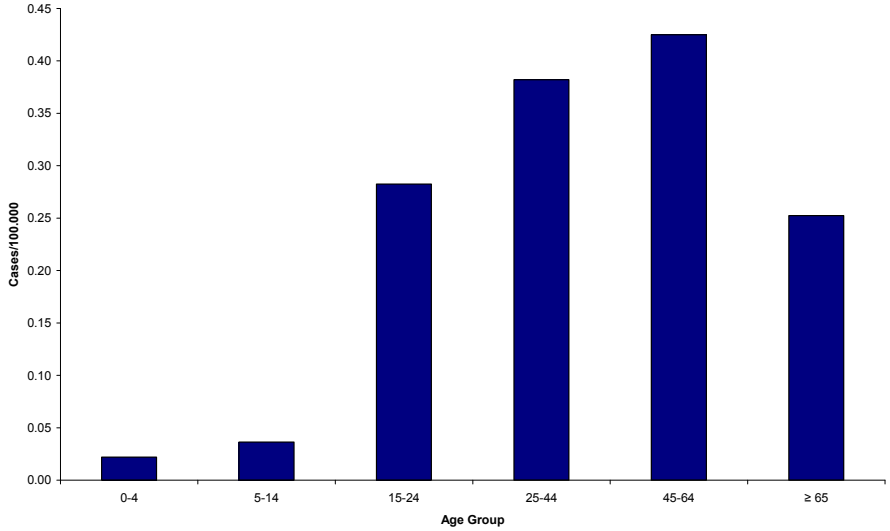
Source: Country reports. *C: Case-based report; —: No report.

**Q fever is not a notifiable disease in Austria.

Age and gender distribution

The age distribution shows a steady increase in incidence with age from the 0–4 year-olds to the most affected age group, the 45–64 year-olds (0.42 per 100 000), followed by the 25–44 year-olds (0.38 per 100 000). Of the 580 cases for which gender data were available, 63% were reported in men (male/female incidence ratio of 1.8).

Figure 4.31.2. Age-specific incidence distribution of Q fever cases for selected European countries, 2005 (n = 580)

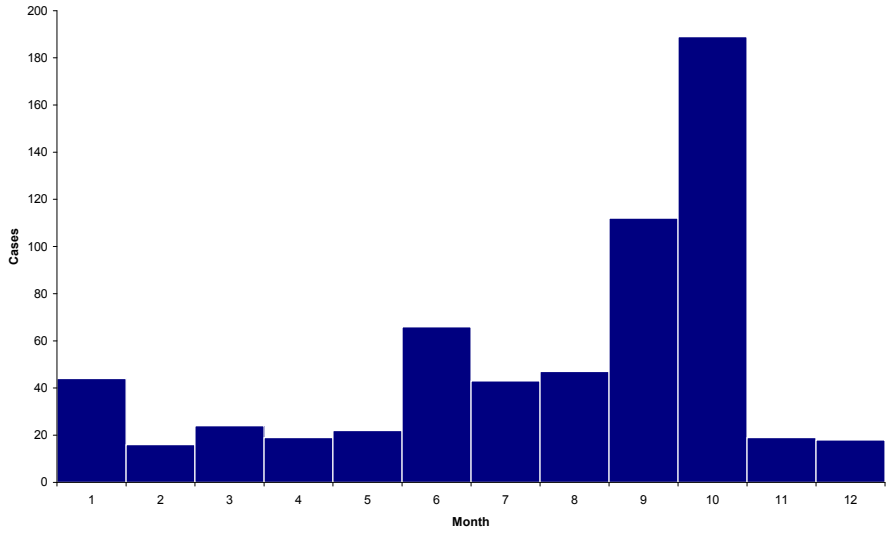


Source: Country reports. Reports with age-specific data were available from: Czech Republic, Germany, Hungary, Ireland, Netherlands, Portugal, Spain and Sweden. Q fever is not a notifiable disease in Austria.

Seasonality

The overall tendency is for the cases to peak in September and October, although it is usually known to be related more to the lambing season (hence, not in October, but in spring and early summer). The early autumn peak observed is strongly influenced by the German data that contributed to 66% of the total.

Figure 4.31.3. Distribution of Q fever cases by month, for selected European countries, 2005 (n = 619)



Source: Country reports. Reports with seasonal data were available from: Germany, Hungary, Ireland, Netherlands, Poland, Portugal, Spain and Sweden. Q fever is not a notifiable disease in Austria.

Conclusions

- The lack of consistent reporting makes it difficult to assess accurately the trends over the period 1995–2004.
- No deaths were reported at the EU level.
- This is a disease known to be under-reported due to its non-specific clinical features and the need for laboratory testing to diagnose it.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria										
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	Obligatory, countrywide, based on a double system of reporting Hemorrhagic fevers	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y

Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway										
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Q- fever Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Q-fever	V	Co	P	C-B	Y	N	Y	Y	Y

4.32 Rabies

Rabies is a disease caused by a rhabdovirus of the genus *Lyssavirus*. Classic rabies is essentially a zoonosis, and most animals are susceptible to it. It is generally transmitted by biting animals and its main reservoir is wild and domestic canids. Six other *Lyssavirus* species are now recognised, whose pathogenicity for humans is variable, and for which bats are the reservoir. Of these, two are present in Europe (European bat lyssavirus 1 and 2).

Transmission normally occurs through a bite or direct contact with the saliva of an infected animal. After an incubation period of 3–8 weeks (though sometimes much longer), non-specific symptoms appear, such as apprehension, headache, fever and paraesthesia around the site of the bite. A phase of convulsive symptoms and (eventually) coma follows, which almost invariably lead to the patient's death, there being no effective therapies.

Prevention is possible by vaccination, including post-exposure immunisation (passive and active) to be given as soon after the exposure as possible. Preventive veterinary measures include proper vaccination of cats and dogs. Oral vaccination has proven effective in preventing the spread of disease within wild animal populations.

10-year trends

A total of 21 human rabies cases have been reported in the EU over the entire period 1995–2004. France, with five cases, reported the most, followed by UK (four cases), Lithuania (three cases) and Poland and Germany (both with two cases). Austria, Italy, Latvia, the Netherlands and Sweden each reported one case. The overall level of reporting has remained low in recent years, averaging less than three cases a year since 1997.

The situation in 2005

In 2005, five cases of rabies were reported, four of them from Germany and one from the UK.

Age and gender distribution

Data on gender were available for four of the cases. The four cases were equally divided into two males and two females, with one of these four in the group aged 25–44 years, two in the 45–64 age group and the remaining one was over 65 years old.

Imported cases

The importation status of the four cases reported by Germany is rather unusual. Out of the four cases, three were autochthonous, but they were infected after receiving contaminated organ transplantation from a donor with no symptoms of rabies infection (the fourth case) who was believed to have been infected in India.

Monitored threats in 2005

Three events related to rabies were followed up in 2005. A woman from the UK contracted rabies through the bite of a stray dog during her holiday in India. She fell ill after her return home and finally died despite receiving treatment. In Canada, a group of European dancers were given prophylactic treatment after potential exposure to bat rabies. The dancers were from eight EU Member States and Norway.

Conclusions

- Rabies is very rare disease in the EU.
- The risk of resurgence of rabies into the EU does exist, especially through the cross-border movements of rabid animals.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Rabies	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y

Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Rabies Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Rabies	O	Co	A	C-B	Y	N	Y	Y	Y

4.33 Rubella

Rubella (German measles) is a mild febrile exanthematous illness caused by a virus belonging to the *Togaviridae* family (*Rubivirus* gender). It is transmitted person-to-person via droplets (the virus is present in the pharyngeal secretions). It affects mainly, but not only, children and when pregnant women are infected, it may be teratogenic. Humans are the only reservoir of infection.

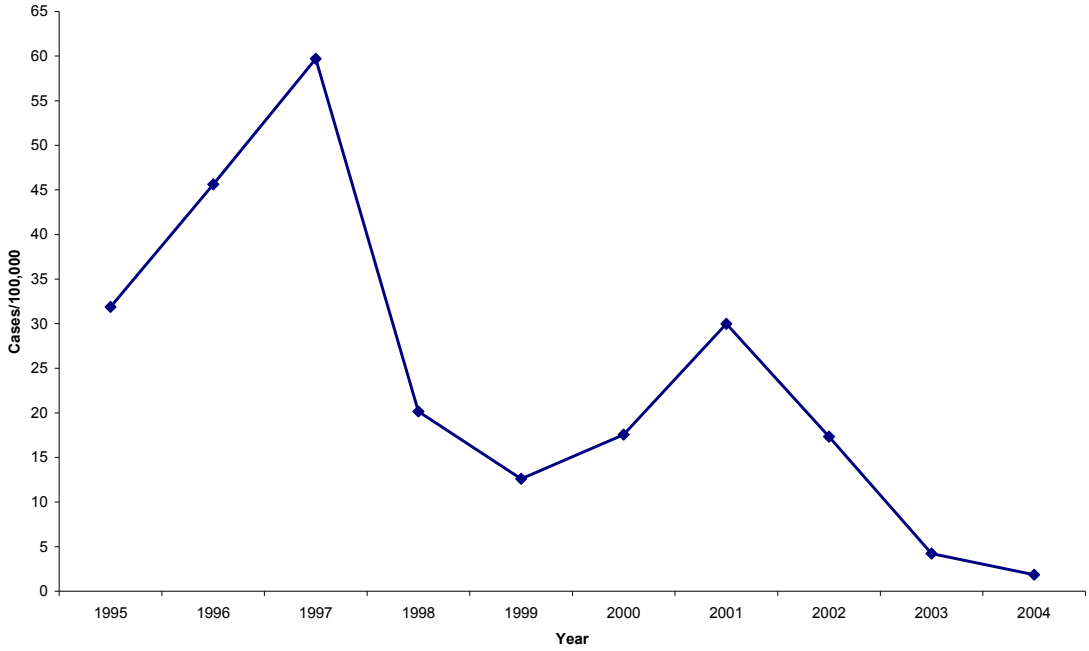
About 20–50% of rubella infections remain asymptomatic. In symptomatic cases, after an incubation period of 2–3 weeks, patients develop lymphadenopathy, malaise, exanthema, and upper respiratory tract symptoms. Fever is not always present. Adult and adolescent females often manifest arthralgia and arthritis. Rare complications include thrombocytopenic purpura, encephalitis, neuritis, and orchitis.

The most serious consequences of rubella infection occur when it is acquired during the first trimester of pregnancy. In this situation the virus can affect all the organs of the developing foetus, causing foetal death, miscarriage, or congenital anomalies. An infant infected with rubella in utero can continue to shed the virus for about one year, sometimes longer.

10-year trends

Complete data on reported cases of rubella were available for 20 out of the 25 EU Member States, together with Iceland and Norway. No data were available for Austria (where it is not a notifiable disease), France, Liechtenstein or Germany during this period, while Belgium and Luxembourg submitted data for some of the years. The overall trend of rubella in Europe is decreasing, with a dramatic drop between 1997 and 1999.

Figure 4.33.1. Incidence rate of rubella cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Austria, France, Germany and Liechtenstein. Rubella is not a notifiable disease in Austria.

Despite this generally decreasing trend, recrudescence has been observed, particularly in Poland in 1997 and 2001, Czech Republic in 1998, Greece in 1998–99, Latvia in 1996, 1998 and 2002 and in Iceland in 1996.

Situation in 2005

In 2005, a total of 1 498 cases were reported by 22 countries. The highest incidence was reported by Lithuania (3.44 per 100 000) and the Netherlands (2.23 per 100 000). The overall incidence was 0.51 per 100 000.

Table 4.33.1. Number of rubella cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria**	C	2	0.02
Belgium	—	—	—
Cyprus	C	0	0.00
Czech Republic	C	8	0.08
Denmark	C	0	0.00
Estonia	C	6	0.45
Finland	—	—	—
France	—	—	—
Germany	—	—	—
Greece	A	0	0.00
Hungary	C	6	0.06
Ireland	C	17	0.41
Italy	C	297	0.51
Latvia	C	35	1.52
Lithuania	C	118	3.44
Luxembourg	C	0	0.00
Malta	C	3	0.74
Netherlands	C	364	2.23
Poland	C	19	0.05
Portugal	C	0	0.00
Slovakia	C	1	0.02
Slovenia	-	—	—
Spain	C	586	1.36
Sweden	C	0	0.00
United Kingdom	C	35	0.06
EU total		**1 497**	**0.52**
Iceland	C	0	0.00
Liechtenstein	—	—	—
Norway	C	1	0.02
Total		**1 498**	**0.51**

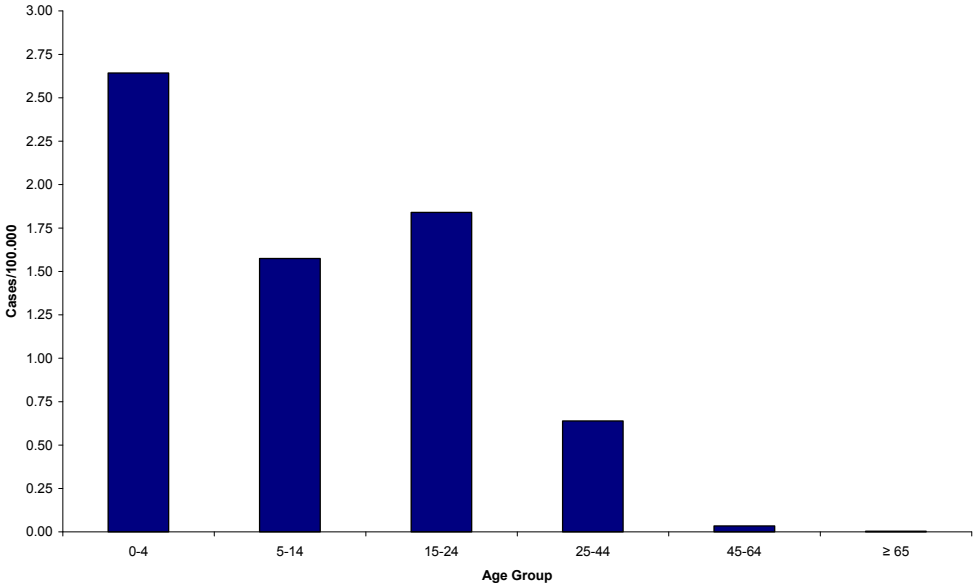
Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

**Data from hospital discharge registry as rubella is not a notifiable disease in Austria.

Age and gender distribution

The highest incidence of confirmed rubella cases was reported in the age group 0–4 years (2.64 per 100 000) followed by 15–24 years (1.84 per 100 000). However, these data are mostly influenced by the data from the Netherlands and Spain that notified the highest number of cases (69%).

Figure 4.33.2. Age-specific incidence distribution of rubella cases for selected European countries, 2005 (n = 1 189)



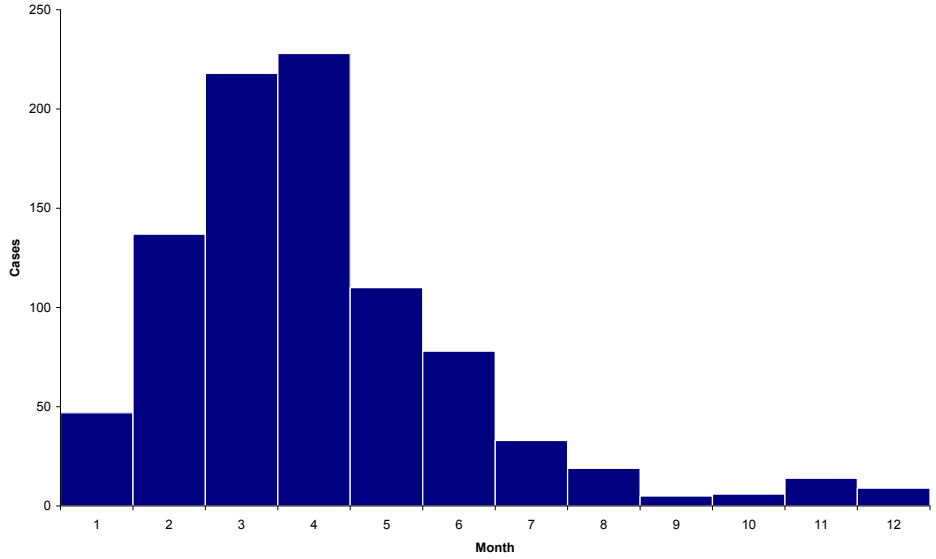
Source: Country reports. Reports with age-specific data were available from: Austria, Czech Republic, Estonia, Hungary, Ireland, Italy, Latvia, Malta, Netherlands, Slovakia, Spain, Iceland and Norway. Rubella is not a notifiable disease in Austria.

Of those confirmed cases with information on gender (n = 1 182), 47% (561) were male and 53% (621) were female. In Spain, 60% of cases were reported to be in males (265/443) and 40% of cases were female (178/443).

Seasonality

In 2005, the incidence of rubella was lowest from September to December and peaked in March and April. Again, these data are very strongly influenced by the reports from the Netherlands and Spain who notified the highest number of cases (90%).

Figure 4.33.3. Distribution of rubella cases by month, for selected European countries, 2005 (n = 904)



Source: Country reports. Reports with seasonal data were available from: Estonia, Hungary, Ireland, Latvia, Malta, Netherlands, Poland, Slovakia, Spain and Norway. Rubella is not a notifiable disease in Austria.

Conclusions

- Rubella incidence has decreased greatly all around Europe.
- The occasional epidemic of rubella in European countries can still be observed.
- In the data for 2005, analyses by age, sex and season are biased by the reports from the Netherlands and Spain, because of outbreaks that occurred there.
- No data were available for some countries known to still have a high incidence.
- The age and sex distributions vary across countries and may reflect a variation in the vaccine coverage by sex (some vaccination programmes started in women first) together with a variations in notification practices (more attention given to rubella in girls and women).

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 b	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium										
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y

Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Rubella	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Renarub	V	Co	A	C-B	Y	Y	Y	Y	N
Germany										
Greece	Sentinel	V	Se	P	A	N	Y	N	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	other VPD EU case definitions	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Rubella Surveillance	C	Co	P	C-B	N	Y	N	N	Y

	System									
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Rubella	O	Co	P	C-B	Y	N	Y	Y	Y

4.34 Salmonellosis (non-typhi, non-paratyphi)

Enteric infections due to bacteria belonging to the *Salmonella* genus are generally referred to by the term 'salmonellosis' when they are due to *Salmonella* species other than *S. typhi* and *S. paratyph* (see Section 4.44).

Various animals (especially poultry, pigs, cattle, and even reptiles) can be their reservoir, and humans generally become infected by ingesting poorly cooked, contaminated food. The incubation period and the symptoms depend on the amount of bacteria present in the food, the immune status of the host (patient) and the Salmonella species in question.

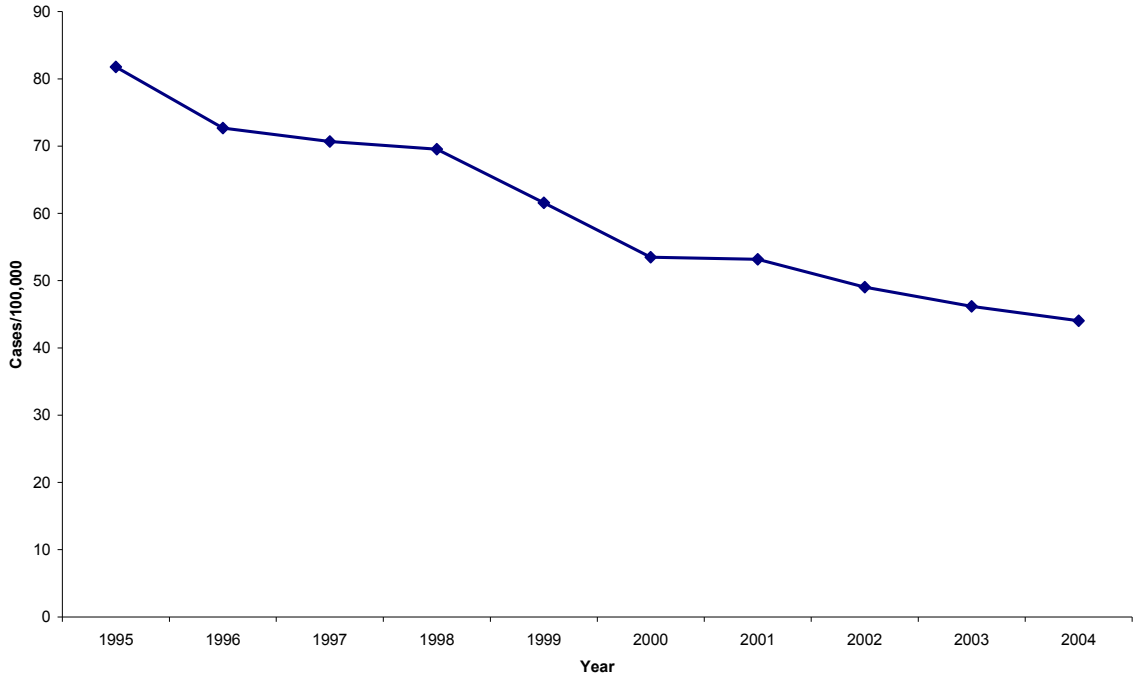
In general, 12 to 36 hours after the ingestion of contaminated food, a clinical picture characterised by fever, diarrhoea, abdominal pain, nausea and vomiting may appear. Symptoms usually last for a few days. Due to the effects of dehydration, hospital admission may sometimes be required. In the elderly and otherwise weak patients some fatal cases occur. Such patients are also more prone to developing sepsis, following enteric invasion by the pathogen in question. In addition, post-infectious complications, such as reactive arthritis occur in about 10% of the cases. Other, more serious long-term sequelae associated with increased mortality have also been reported but their prevalence is still largely unknown.

Enteritis-causing *Salmonellae* are present worldwide. Prophylactic measures are aimed at all stages of food supply, from production to distribution and consumption.

10-year trends

Data on Salmonellosis was available from all 25 EU Member States, Norway and Iceland for the period 1995 to 2003. Only Austria (1995), the Netherlands (2004) and Iceland (1995) had missing data for one of the years, while Liechtenstein did not submit any data. The incidence of salmonellosis cases has been steadily declining since 1995 (figure 4.34.1). Despite the generally decreasing trend, some countries have reported an increase in 2004 of more than 5%: Cyprus, Czech Republic, Denmark, Greece and Lithuania. This probably reflects the occurrence of outbreaks in that year. A global epidemic of egg-related *Salmonella* Enteritidis infections has heavily contributed to the European salmonellosis epidemiology, and this serotype has been by far the most common in Europe, and more dominant here than in most parts of the world.

Figure 4.34.1. Incidence rate of salmonellosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data from all 25 EU Member States, Iceland and Norway for 1995–2003. No data available for Liechtenstein.

More than 2.7 million cases of human salmonellosis were reported between 1995 and 2004 in the EU25, Iceland and Norway.

The situation in 2005

In 2005, a total of 181 876 human salmonellosis cases were reported by 27 countries, with the highest incidence reported in Czech Republic (322.16 per 100 000), followed by Slovakia (223.67 per 100 000). The estimated overall incidence rate for Europe was 39.01 per 100 000. Despite the general decreasing trend, some countries have reported an increase of more than 5% since 2004 (Czech Republic, Denmark, Estonia, Finland, Latvia, and Lithuania). This could be due to improved surveillance systems (particularly in the new Member States), but also to the occurrence of outbreaks that year.

Twenty-six countries (25 EU Member States and Norway) reported 182 854 cases to Enter-net. Due to the different origin of the data (various National Reference Laboratories) and the different extent of coverage of these data in individual countries, the incidences given here may not be a true reflection of the national notification data. Alternative sources of information, i.e. returning travellers used as sentinels, indicates a very large degree of under-reporting of cases in some of the Member States[1].

Table 4.34.1. Number of salmonellosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000	Enter-net reported cases	Incidence /100 000
Austria	C	5 615	68.42	5 565	69.56
Belgium	C	4 916	47.06	4 894	46.61
Cyprus	C	59	7.88	64	9.14
Czech Republic	C	32 927	322.16	32 171	315.40
Denmark	C	1 798	33.23	1 806	32.84
Estonia	C	312	23.16	313	24.08
Finland	C	2 478	47.32	2 489	47.87
France	C	5 877	9.42	6 089	10.15
Germany	C	52 245	63.33	52 245	63.3
Greece	C	1 038	9.37	1 317	11.97
Hungary	C	7 820	77.44	7 227	77.40
Ireland	C	349	8.49	357	8.71
Italy	C	7 980	13.65	3 702	6.45
Latvia	C	639	27.71	640	27.83
Lithuania	C	2 348	68.55	2 023	48.17
Luxembourg	C	211	46.37	204	40.80
Malta	C	66	16.39	99	24.75
Netherlands	A	1 388	8.51	1 388	13.20
Poland	C	15 048	39.42	20 254	52.47
Portugal	C	468	4.44	724	7.17
Slovakia	C	12 044	223.67	12 248	220.30
Slovenia	C	1 418	70.99	1 549	80.70
Spain	C	6 996	16.26	6 180	15.02
Sweden	C	3 571	39.63	3 721	40.25
United Kingdom	C	12 692	21.14	14 194**	23.49
EU total		**180 303**	**39.09**	**181 465**	**39.44**
Iceland	C	91	30.99	—	—
Liechtenstein		—	—	—	—
Norway	C	1 482	32.17	1 528	33.96
Total		**181 876**	**39.01**	**182 993**	**39.35**

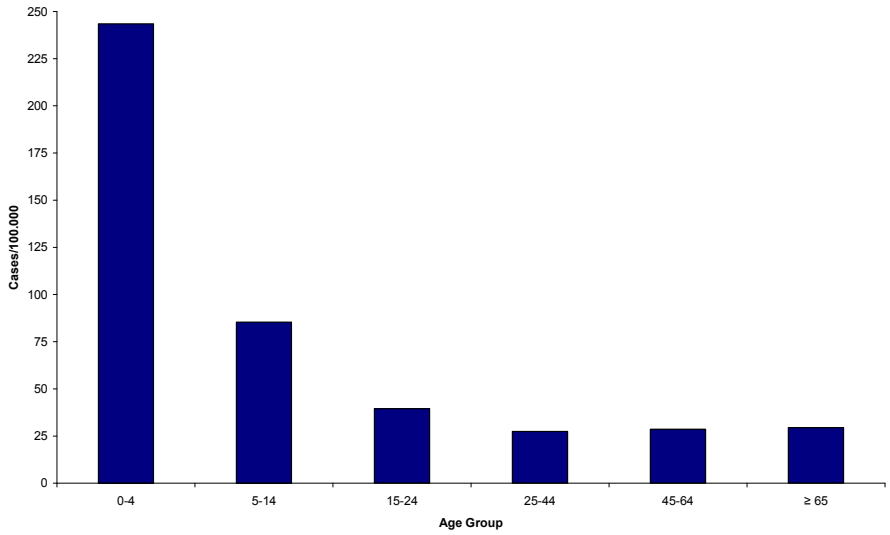
Source: Country reports and Enter-net. *A: Aggregated report; C: Case-based report; —: No report.

** Data for England, Scotland and Wales only.

Age and gender distribution

The highest incidence was reported in the age group 0–4 years (243.4 per 100 000, representing 27% of all cases), and then it decreased steadily in the older age groups. Of the reports for which information on gender was available (n = 138 290), there was no difference in the incidence between women (30.1 per 100 000) and men (30.7 per 100 000).

Figure 4.34.2. Age-specific incidence distribution of salmonellosis cases for selected European countries, 2005 (n = 122 534)

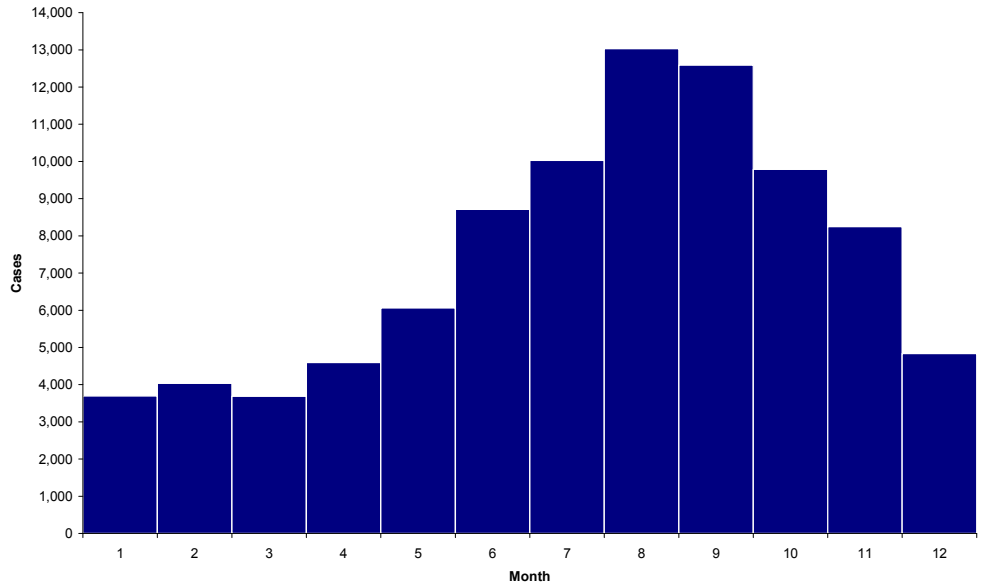


Source: Country reports. Reports with age-specific data were available from: Austria, Cyprus, Czech Republic, Denmark, Estonia, Germany, Hungary, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, Sweden, Iceland and Norway.

Seasonality

The data show a clear tendency for salmonellosis to increase as the weather warms up, reaching a peak in the late summer and then starting to decline as the autumn sets in.

Figure 4.34.3. Distribution of salmonellosis cases by month, for selected European countries, 2005 (n = 89317)



Source: Country reports. Reports with seasonal data were available from: Austria, Cyprus, Denmark, Estonia, Germany, Ireland, Lithuania, Luxembourg, Malta, Poland, Portugal, Spain, Sweden, Iceland and Norway.

Imported cases

The majority of cases were domestically acquired (49%). Only in 8% of cases was there an indication that the disease could have been acquired abroad while for 43% of the cases there was no information on importation status. Sweden, the Netherlands, Iceland and Norway had the highest proportions of imported cases (77–87%).

Enter-net data

Enter-net is the international surveillance network for human *Salmonella, Escherichia coli* and *Campylobacter* infections. The participants in the network are the microbiologists in charge of the National Reference Laboratories for *Salmonella* and *Escherichia coli* infections, and the epidemiologists responsible the national surveillance of these diseases. Twenty-six countries (25 EU Member States and Norway) reported 183 447 cases to Enter-net.

Salmonella serovars

S. Enteritidis was the most frequently reported serovar on the Enter-net database, followed by *Salmonella* Typhimurium (table 4.34.2). Enter-net received 69 290 (69.1%) *Salmonella* Enteritidis and 12 828 (12.8%) *Salmonella* Typhimurium cases. The unusually high ranking of the serovar *Salmonella* Bovismorbificans was due to a large outbreak of *Salmonella* Bovismorbificans in Germany.

Table 4.34.2. Number of salmonellosis cases reported to Enter-net, by serovar (10 most frequent serovars), 2005

Serovar	N	%
S. Enteritidis	69 290	69.1
S. Typhimurium	12 828	12.8
S. Hadar	2 064	2.1
S. Virchow	1 026	1.0
S. Infantis	887	0.8
S. Agona	606	0.6
S. Newport	599	0.6
S. Stanley	535	0.5
S. Bovismorbificans	533	0.5
S. Derby	481	0.5

Source: Enter-net.

Antimicrobial resistance

Data on antimicrobial resistance for Salmonella were provided by Enter-net. Tables 4.34.3 and 4.34.4 show the resistance for a number of antimicrobials for *Salmonella* Enteritidis (*S.E.*) and *Salmonella* Typhimurium (*S.T.*). Overall, resistance for Nalidixic acid was found in 21% of *S.E.*, for Sulphonamids in 10% and Ampicillin in 7%. Only 0.5% of *S.E.* showed resistance for Ciprofloxacin. For *S.T.*, the highest levels of resistance were observed for Sulphonamide, Tetracycline and Ampicillin in 68%, 64% and 62% respectively. Only 29 (0.5%) of tested *S.T.* isolates were resistant for Ciprofloxacin. For *S.E.*, 69% of isolates are fully sensitive to all tested antimicrobials and less than 1% are resistant to more than four. The situation for *S.T.* is markedly different as only 21% of isolates are fully sensitive, but 27% are resistant to more than four of the tested antimicrobials.

Table 4.34.3. Pattern of antimicrobial resistance in *Salmonella* Enteritidis from humans, 2005

Antimicrobial Group	Antimicrobials	Sensitive (%)	Intermediate (%)	Resistant (%)	Total
Aminoglycosides	Gentamicin	12 780 (99.4)	19 (0.1)	63 (0.5)	12 862 (100)
	Kanamycin	12 026 (99.6)	11 (0.1)	38 (0.3)	12 075 (100)
	Streptomycin	11 217 (97.1)	32 (0.3)	302 (2.6)	11 551 (100)
Amphenicols	Chloramphenicol	12 871 (99.5)	6 (0.0)	57 (0.4)	12 934 (100)
Cephalosporins	Cefotaxime	12 453 (99.8)	10 (0.1)	17 (0.1)	12 480 (100)
Fluoroquinolones	Ciprofloxacin	13 679 (99.5)	8 (0.0)	76 (0.6)	13 763 (100)
Penicillins	Ampicillin	13 219 (92.9)	49 (0.3)	962 (6.8)	14 230 (100)
Quinolones	Nalidixic acid	9 228 (78.4)	19 (0.2)	2 518 (21.4)	11 765 (100)
Sulphonamides	Sulphonamides	10 412 (89.5)	48 (0.4)	1 169 (10.1)	11 629 (100)
Tetracyclines	Tetracyclines	11 146 (89.6)	775 (6.2)	513 (4.1)	12 434(100)
Trimethoprim	Trimethoprim	13 348 (97.2)	13 (0.1)	365 (2.7)	13 726 (100)

Source: Enter-net.

Table 4.34.4. Pattern of antimicrobial resistance in *Salmonella* Typhimurium from humans, 2005

Antimicrobial group	Antimicrobials	S (%)	I (%)	R (%)	Total
Aminoglycosides	Gentamicin	4 922 (94.7)	74 (1.4)	204 (3.9)	5 200 (100)
	Kanamycin	4 462 (95.3)	82 (1.8)	137 (2.9)	4 681 (100)
	Streptomycin	1 507 (34.5)	257 (5.9)	2 602 (59.6)	4 366 (100)
Amphenicols	Chloramphenicol	3 360 (64.2)	4 (0.1)	1 869 (35.7)	5 233 (100)
Cephalosporins	Cefotaxime	5 280 (99.2)	10 (0.2)	31 (0.6)	5 321 (100)
Fluoroquinolones	Ciprofloxacin	5 771 (99.4)	7 (0.1)	29 (0.5)	5 807 (100)
Penicillins	Ampicillin	2 157 (37.4)	30 (0.5)	3 584 (62.1)	5 771 (100)
Quinolones	Nalidixic acid	4 506 (93.2)	12 (0.2)	319 (6.6)	4 837 (100)
Sulphonamides	Sulphonamides	1 428 (32.2)	7 (0.2)	3 006 (67.7)	4 441 (100)
Tetracyclines	Tetracyclines	1 697 (31.6)	226 (4.2)	3 442 (64.2)	5 365 (100)
Trimethoprim	Trimethoprim	4 127 (85.0)	38 (0.8)	689 (14.2)	4 854 (100)

Source: Enter-net.

Monitored threats in 2005

A total of 13 outbreaks involving non-typhoid *Salmonellae* have been monitored where either more than one member state was involved or the implicated vehicle was imported. For five of them no source could be determined. Seven different *Salmonella* serovars were involved (Enteritidis, Typhimurium [1x NST, 2x DT 104], Agona, Goldcoast, Hadar, Manhattan, Stourbridge) and in one outbreak only *Salmonella* species were identified. The implicated vehicles included meat, beef, pre-cooked chicken, salami, raw milk goat's cheese and powdered infant formula (Agona). Five of the outbreaks were travel-associated, domestic food was involved in four of them, and in four others the implicated food was imported. The threats were identified through the EWRS (eight) and Enter-net (five).

Conclusions

- The overall decreasing trend of the last 10 years in the EU continued into 2005 for human salmonellosis for most of the Member States.
- Nevertheless, it is still an important zoonosis contributing to a high burden of gastrointestinal disease in the EU, despite the known very significant under-reporting of this disease.
- Prevention and control of the disease must involve a coordinated multidisciplinary effort from public health, veterinary and food safety experts.

References

1. de Jong B, Ekdahl K. The comparative burden of salmonellosis in the European Union Member States, associated and candidate countries. *BMC Public Health* 2006; 6:4.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Salmonellosis	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register	C	Co	P	C-B	Y	Y	N	N	Y

	(NIDR)									
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	LSI: laboratory surveillance infectious diseases	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Salmonellosis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N

Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Salmonellosis	O	Co	P	C-B	Y	N	Y	Y	Y

4.35 Severe acute respiratory syndrome (SARS)

Severe acute respiratory syndrome (SARS) is a life-threatening respiratory disease caused by a recently identified coronavirus: the SARS-associated coronavirus (SARS-CoV). This is believed to be an animal virus that recently crossed the species barrier to infect humans.

The first cases of disease in humans are believed to have occurred in Guangdong province, China, in November 2002, but the syndrome was only recognised three months later. Following its emergence, transmission of the virus occurred person to person, mostly via droplets (inhalation).

The incubation period ranges between three and 10 days. A high fever then appears accompanied by constitutional symptoms and, often, by diarrhoea. Some days later interstitial pneumonia becomes manifest, which in some cases progresses to produce fatal respiratory failure (overall case fatality rate was about 10%, but exceeded 50% for patients aged over 60 years).

The natural reservoirs of SARS-CoV have not been identified, but a number of species of wildlife (e.g. civets, ferrets) consumed as delicacies in southern China have been found to be infected by a related coronavirus. Domestic cats living in the Amoy Gardens apartment block in Hong Kong (which was heavily hit by the outbreak) were also found to be infected. More recently, bats, ferrets and domestic cats were experimentally infected with SARS-CoV and found to efficiently transmit it. These findings indicate that the reservoir for this pathogen may include a wide range of animal species.

Cases and trends

SARS was first recognised as a global threat in mid-March of 2003. WHO reported that the last human chain of transmission in that epidemic had been broken on 5 July 2003. By then, the international spread of SARS-CoV had resulted in 8 098 cases from 26 countries, with 774 deaths and massive consequences for international trade and health systems.

There were no SARS cases reported in 2005. Today, the most probable sources of infection with SARS-CoV is exposure in laboratories where the virus is used or stored for diagnostic and research purposes, or from animal reservoirs of SARS-CoV-like viruses. It is very difficult to predict when or whether SARS will re-emerge in epidemic form. In 2003–04, there were four occasions when SARS reappeared. Three of these incidents were attributed to breaches in laboratory bio-safety and resulted in one or more cases of SARS (in Singapore, Taipei and Beijing). Only one of these incidents resulted in secondary transmission outside of the laboratory. The fourth incident (Guangzhou, Guangdong province, China) resulted in several sporadic, community-acquired, cases.

WHO strongly urges countries to conduct an inventory of all laboratories working with cultures of live SARS-CoV or storing clinical specimens actually or potentially contaminated with SARS-CoV. WHO also recommends that each country ensures that the correct bio-safety procedures are followed by all laboratories working with the SARS corona virus and other dangerous pathogens. In addition, appropriate monitoring and investigation of illness in laboratory workers should be undertaken. The resurgence of SARS leading to an outbreak remains a distinct possibility and does not allow for complacency. In the inter-epidemic period, all countries must remain vigilant for the recurrence of SARS and maintain their capacity to detect and respond to the re-emergence of SARS when and if necessary.

Conclusions

- While much has been learnt about this syndrome, our knowledge about the epidemiology and ecology of SARS-CoV infection remains very incomplete.
- More research is needed to establish the reservoir for this pathogen as it may involve a range of animal species.
- It remains very difficult to predict when or whether SARS will re-emerge in epidemic form so a high level of surveillance must be maintained in this inter-epidemic period.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	Surveillance of SARS in the Czech Republic	C	Co	A	C-B	Y	Y	Y	Y	Y
Germany										
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting SARS	C	Co	P	C-B	Y	Y	Y	Y	Y
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
United Kingdom	UK Severe acute respiratory syndrome (SARS)	V	Co	A	C-B	Y	N	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y

Ireland	General non EU case definitions	C	Co	P	C-B	Y	Y	N	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Italy										
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg										
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y

4.36 Shigellosis

Shigellosis is caused by bacteria belonging to the *Shigella* genus, which includes several species pathogenic to man, with humans as their main reservoir.

Transmission occurs by the oral-faecal route, either directly person to person or spread via contaminated food or water. The infective dose may be very low, but this, as well as the incubation period (12 hours to one week) and the clinical picture which ensues, also depend on the *Shigella* species in question (geographical differences are marked). More recently, sexual transmission among MSM has become a more common cause of outbreaks in several countries.

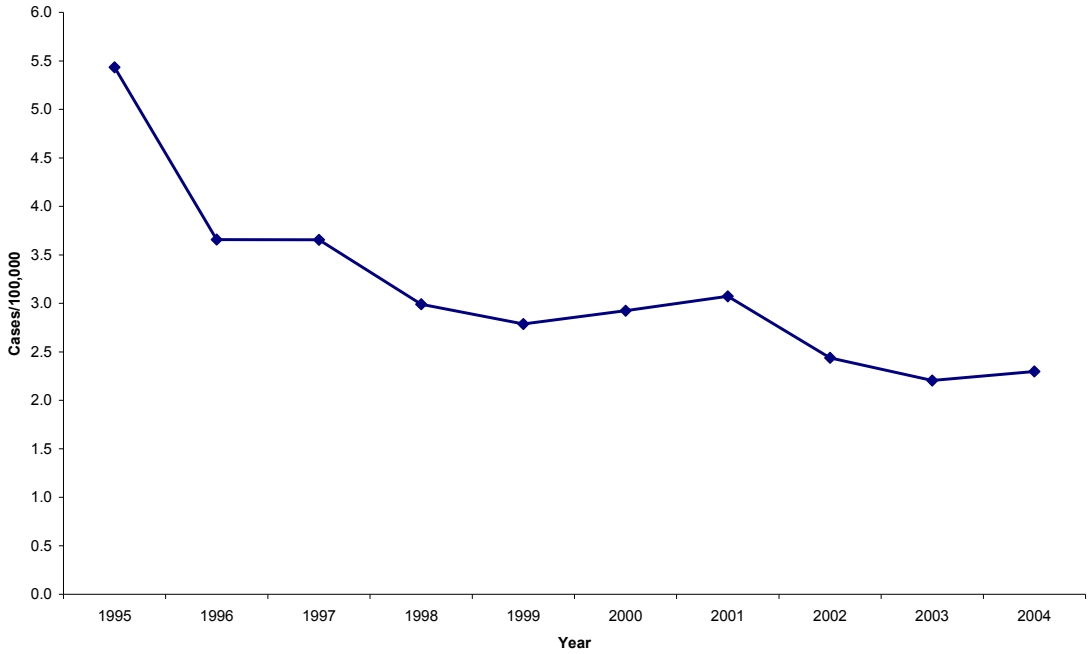
The clinical picture may therefore vary between a mild enteritis (watery, self-limiting diarrhoea) and very serious presentations (high fever, dysentery, megacolon, intestinal perforation, haemolytic-huremic syndrome). Reactive arthritis and Reyter's syndrome can follow the enteric symptoms. Antibiotic therapy and rehydratation are effective. Shigellosis is a leading cause of childhood deaths in developing countries.

Prevention measures are based on good general food and waste hygiene and proper hand-washing.

10-year trend

Data from all the 25 EU Member States, Iceland and Norway are available for the period 1995 to 2004 (apart for Luxembourg in 2004). The incidence has been declining over the last 10 years with a slight peak in 2001 (figure 4.36.1).

Figure 4.36.1. Incidence rate of shigellosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The situation in 2005

In 2005, a total of 7 425 human shigellosis cases were reported by 26 countries. The European incidence rate was 1.82 per 100 000, with Lithuania (13.43 per 100 000) followed by Slovakia (9.51 per 100 000) reporting the highest country rates. The overall incidence rate was 1.82 per 100 000.

Table 4.36.1. Number of shigellosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	111	1.35
Belgium	C	425	4.07
Cyprus	C	1	0.13
Czech Republic	C	278	2.72
Denmark	C	162	2.99
Estonia	A	98	7.28
Finland	C	113	2.16
France	C	791	1.27
Germany	C	1 139	1.38
Greece	C	22	0.04
Hungary	C	85	0.84
Ireland	C	36	0.88
Italy	—	—	—
Latvia	C	186	8.06
Lithuania	C	460	13.43
Luxembourg	C	6	1.32
Malta	C	0	0.00
Netherlands	C	420	2.58
Poland	C	79	0.21
Portugal	C	2	0.02
Slovakia	C	512	9.51
Slovenia	C	34	1.70
Spain	C	219	0.51
Sweden	C	571	6.34
United Kingdom	C	1 505	2.51
EU total		**7 255**	**1.80**
Iceland	C	5	1.70
Liechtenstein	—	—	—
Norway	C	165	3.58
Total		**7 425**	**1.82**

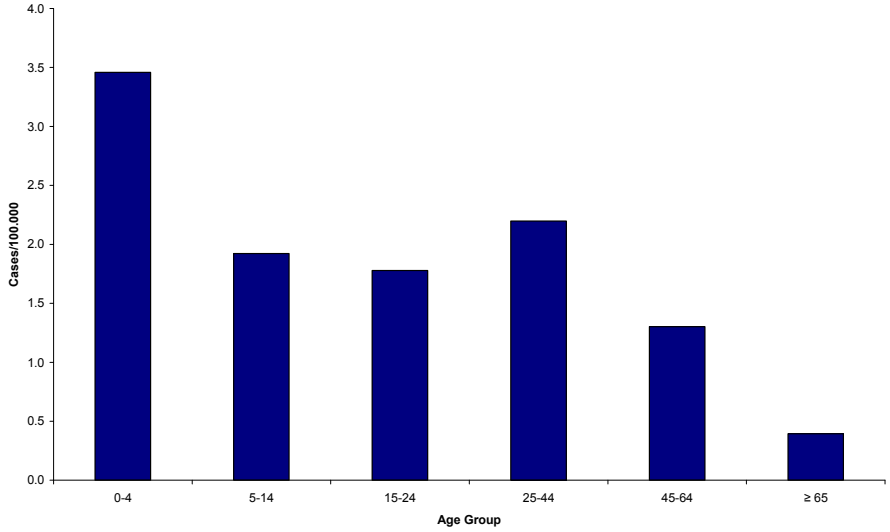
Source: Country reports. *A: Aggregated report; C: Case-based report; 0: No case reported; —: No report.

Age and gender distribution

The data for age groups were available from 17 EU Member States. The highest incidence was in the under fives (3.5 per 100 000), representing 10% of all cases.

Based on the data from 18 EU Member States (n = 3 653) with this variable, there was no major difference between women and men (incidences 0.98 per 100 000 and 0.81 per 100 000, respectively).

Figure 4.36.2. Age-specific incidence distribution of shigellosis cases for selected European countries, 2005 (n = 3 653)

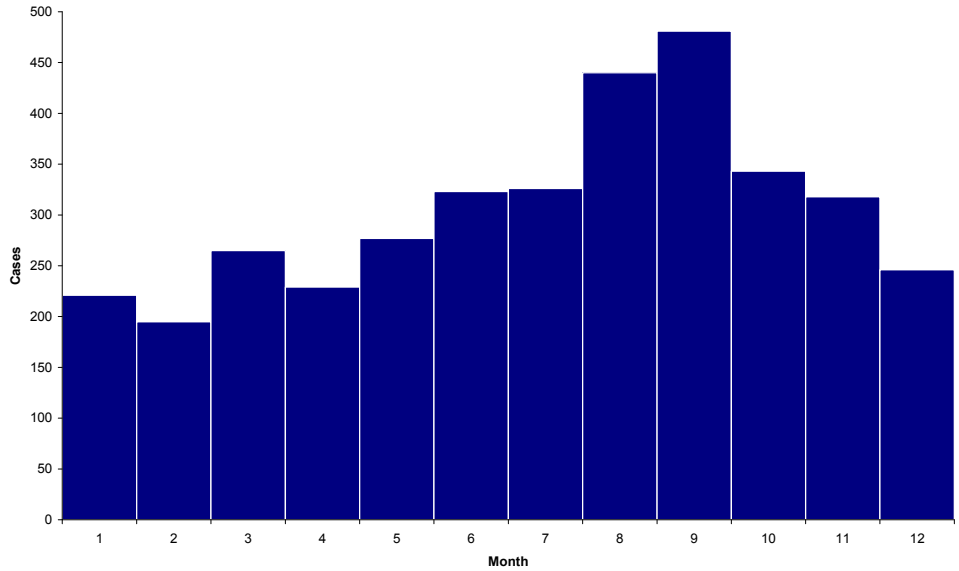


Source: Country reports. Reports with age-specific data were available from: Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Latvia, Netherlands, Portugal, Spain, Sweden, Iceland and Norway.

Seasonality

Data on seasonality was available from 18 EU Member States (n = 3 664). There is a clear trend of increasing numbers of cases as the year warms up to reach a peak in the months of August–September.

Figure 4.36.3. Distribution of shigellosis cases by month, for selected European countries, 2005 (n = 3 664)



Source: Country reports. Reports with seasonal data were available from: Austria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Latvia, Netherlands, Poland, Portugal, Spain, Sweden, Iceland and Norway.

Conclusions

- The overall Shigellosis trend has been declining for the last 10 years.
- The most affected age group is children under four years old.
- More cases are seen in the summer, peaking in the late summer months.
- Information about importation status would be important to monitor for the future.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Pertussis, Shigellosis, Syphilis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to	C	Co	P	C-B	Y	Y	N	N	Y

	registration in Iceland									
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	ENTERNET	V	Se	P	C-B	Y	N	N	N	N
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Shigellosis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Shigellosis	O	Co	P	C-B	Y	N	Y	Y	Y

4.37 Smallpox

Smallpox was a systemic disease, officially eradicated since 1979 (WHO), caused by infection with the *Variola major* virus, whose only reservoir was infected humans.

The infection was usually transmitted via inhalation of droplets. After an average incubation period of 12 days, a high fever accompanied by non-specific constitutional symptoms abruptly appeared. The fever then receded and a characteristic skin eruption appeared. Subsequently the fever rose again, and serious complications generally developed (pulmonary, cardio-circulatory, neurological, etc.), proving fatal in up to 50% of cases. Survivors who overcame this phase would see the exanthema resolving, leaving permanent scars. No effective therapy was available. The disease was preventable by an effective live-attenuated vaccine, whose large scale use lead to its eradication.

Cases and trends

Smallpox was certified as a globally eradicated disease by WHO in 1979 with the last naturally acquired case occurring in Somalia in 1977. This pathogen has been considered as an agent with a potential for intentional release for which the European Commission has issued European clinical guidelines. Otherwise the only risks of transmission would be from handling laboratory stores of the virus held in a small number of reference laboratories.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious	C	Co	P	C-B	Y	Y	N	N	Y

	Disease Register (NIDR)									
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
Germany										
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy										
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia										
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Smallpox	O	Co	A	C-B	Y	N	Y	Y	Y

Note: Portugal reports that it has no specific surveillance system for smallpox.

4.38 Syphilis

Syphilis is a sexually transmitted infection (STI) caused by the bacterium *Treponema pallidum*. It may also be transmitted mother-to-child (congenital syphilis).

Humans are the only reservoir and, apart from congenital cases, the only epidemiologically relevant mode of transmission is by direct contact with treponema-rich, open, muco-cutaneous lesions and contaminated secretions from a patient.

After an incubation period of 10 to 90 days (three weeks on average) clinical symptoms appear: at first a primary lesion (chancre), then a series of eruptions of muco-cutaneous lesions (secondary syphilis), followed by long periods of latency (latent or tertiary syphilis). If untreated, many years after the initial infection, tertiary syphilis lesions might finally appear (visceral, multi-organ involvement, including serious vascular and neurological damage).

Mother-to-child transmission might result in foetal death, peri-natal death or congenital syphilis. The latter can be asymptomatic or present stigmata or determine multi-organ pathology.

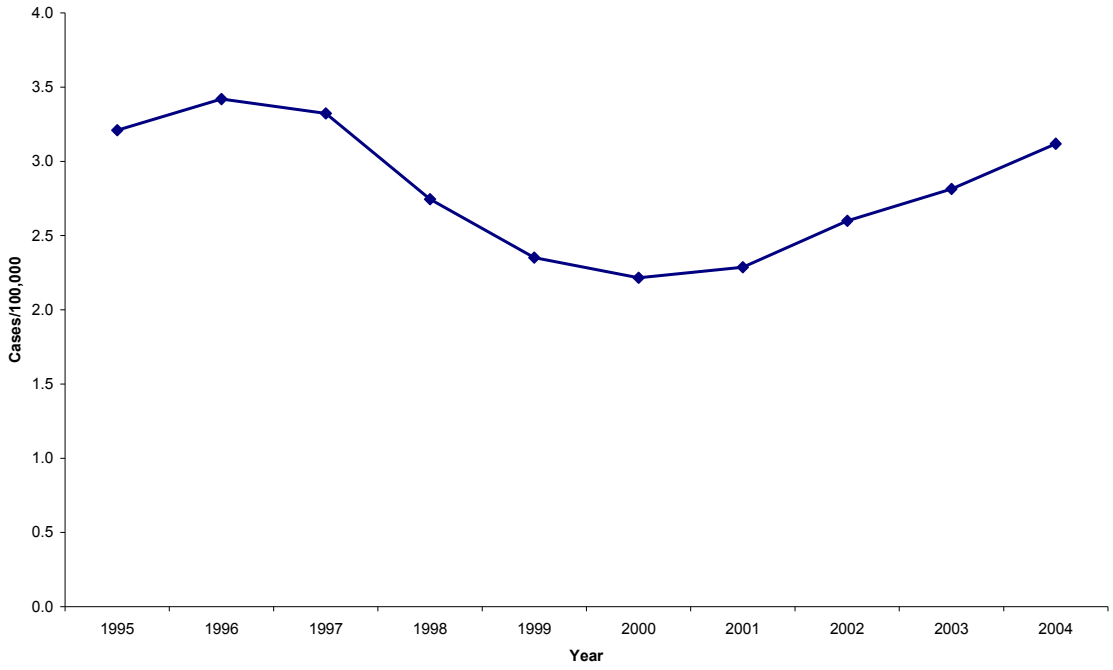
With the widespread use of penicillin, syphilis prevalence had significantly declined after World War II. However, in several industrialised countries a considerable resurgence occurred in the late 1980s.

10-year trends

Twenty-one EU Member States, Iceland and Norway submitted data for the whole period, while France, Malta, Greece and the Netherlands provided syphilis incidence data for some of the years (Liechtenstein did not provide any data).

In the last 10 years, the overall incidence decreased steadily after 1996 from just under 3.5 to 2.2 per 100 000 in 2000, but has been rising steadily since then to 3.1 per 100 000 in 2004, mainly due to outbreaks in large cities involving men who have sex with men. In the Baltic States (Estonia, Latvia and Lithuania) where syphilis incidence was very high in the early 1990s (over 60 cases per 100 000 in 1995), a sharp decrease in incidence has been observed from 1996 to 2004. In some central European countries (Slovakia, Slovenia and Poland) syphilis incidence remained below 10 cases per 100 000 and the overall trend is decreasing.

Figure 4.38.1. Incidence rate of syphilis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The situation in 2005

In 2005, 12 945 syphilis cases were reported by 23 countries. There are many variations in the reporting systems throughout Europe. These vary from syphilis being a notifiable disease with national coverage in for example Cyprus, Czech Republic, Estonia, Finland, Germany, Lithuania and Malta, to syphilis being reported on a voluntary basis by a sentinel network of laboratories in Spain. The highest incidence rates were still recorded in Latvia (19.21 per 100 000), Lithuania (8.61 per 100 000) and Estonia (8.24 per 100 000). The overall incidence rate for Europe was 3.48 per 100 000.

Table 4.38.1. Number of syphilis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	267	3.25
Belgium	C	359	3.44
Cyprus	C	21	2.80
Czech Republic	C	523	5.12
Denmark	C	116	2.14
Estonia	A	111	8.24
Finland	C	142	2.71
France	—	—	—
Germany	C	3 215	3.90
Greece**	—	—	—
Hungary	A	545	5.40
Ireland	—	—	—
Italy	C	1 397	2.39
Latvia	C	443	19.21
Lithuania	C	295	8.61
Luxembourg	C	22	4.84
Malta	C	16	3.97
Netherlands	—	—	—
Poland	C	613	1.61
Portugal	C	90	0.85
Slovakia	C	168	3.12
Slovenia	C	40	2.00
Spain	C	516	1.20
Sweden	C	109	1.21
United Kingdom	C	3 910	6.51
EU total		**12 918**	**3.52**
Iceland	C	3	1.02
Liechtenstein	—	—	—
Norway	C	24	0.52
Total		**12 945**	**3.48**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

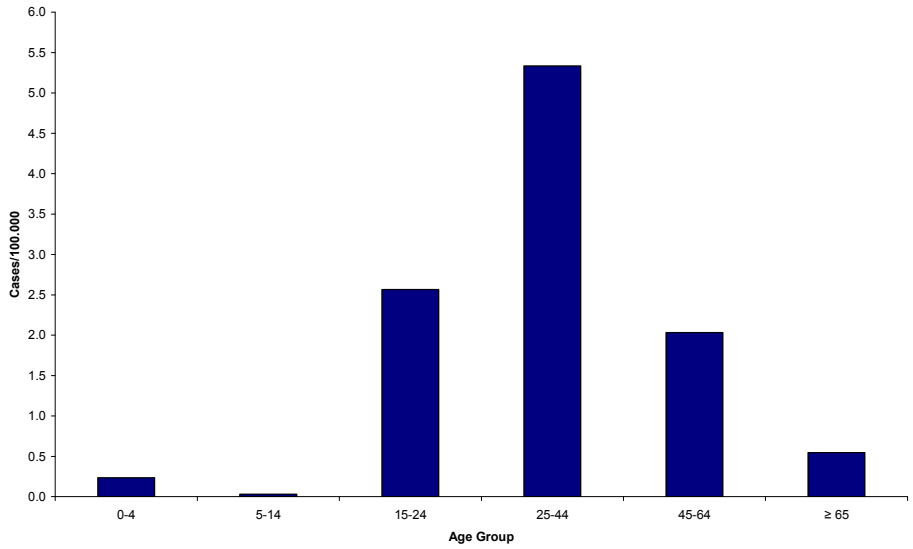
** Syphilis is not notifiable in Greece.

Age and gender distribution

The highest incidence rates were reported in the age groups 25–44 years (5.33 per 100 000) and 15–24 years (2.57 cases per 100 000). In all, 31 syphilis cases were diagnosed in children aged under four years giving an incidence rate equal to 0.23 per 100 000.

Data with information on gender were avaialbe from 18 countries (n = 7 112). The incidence was higher in men (3.16 per 100 000) than in women (0.72 per 100 000), giving a male to female ratio of 4.4:1.

Figure 4.38.2. Age-specific incidence distribution of syphilis cases for selected European countries, 2005 (n = 6 991)



Source: Country reports. Reports with age-specific data were available from: Belgium, Cyprus, Denmark, Estonia, Finland, Germany, Italy, Latvia, Luxembourg, Malta, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Iceland and Norway.

Seasonality

As expected, no seasonal trends were observed in the syphilis reported cases (n=5 414) with information on month of report for 2005.

Conclusions

- High rates of syphilis reached epidemic levels in the Baltic States in the early 1990s. These increases were related to the behaviour and socioeconomic changes that followed the collapse of the former USSR[1]. A decrease in incidence was observed in these countries post-1995, this could reflect a true decrease of the disease but could possibly be linked to under-reporting[2].

- Until the mid-1990s, syphilis incidence rates were very low in western European countries. From 1995 to 1998, increasing incidence rates were observed in most of these countries. These increases were related to several outbreaks of syphilis in large cities, with men having sex with men among the most affected groups[3].

- Reliable national syphilis data was provided by few countries so the incidence for the EU is certainly under-estimated.

- The Baltic States, especially Latvia, Lithuania and Estonia are still reporting the highest incidences in 2005 with 19.21, 8.61 and 8.24 cases per 100 000, respectively.

- Syphilis cases were diagnosed mainly in individuals aged between 25 and 44 years and much more frequently in men than in women.

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3. Fenton KA, Lowndes CM and the European Surveillance of Sexually Transmitted Infections (ESSTI) network. Sex Transm Infect 2004;80:255–63.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	GESCHLECHTSKRANKHEITENGESETZ (STD-law) 1945	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	Register of STD	C	Co	P	C-B	Y	Y	Y	N	Y
Denmark	STI clinical	C	Co	P	C-B	N	Y	N	N	Y
Denmark	Clincial STI system	C	Co	P	C-B	N	Y	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Pertussis, Shigellosis, Syphilis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
Finland	STD sentinel surveillance	V	Se	P	C-B	N	Y	N	N	N
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Sexually transmitted infection	V	Se	A	C-B	Y	Y	Y	Y	N
Germany	SurvNet@RKI - 7.3 (1)	C	Co	P	C-B	Y	N	N	N	Y
Greece										

Hungary	STD surveillance	C	Se	P	A	N	Y	N	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	STI and skin infections surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	STI sentinel surveillance network	V	Se	P	C-B	N	Y	N	N	N
Norway	MSIS (group B diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Syphilis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SPOSUR	C	Co	P	C-B	N	Y	N	N	Y
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Syphilis	V	Ot	A	C-B	Y	Y	Y	Y	Y

4.39 Tetanus

A consequence of an exotoxin produced when the bacterium *Clostridium tetani* contaminates wounds (in most cases), tetanus is often a fatal disease, present worldwide.

The main reservoirs of the bacterium are herbivores, which harbour it in their bowels (with no consequences for them) and disseminate its spores in the environment with their faeces.

Most cases of human disease occur as a result of wounds, especially those accompanied by tissue necrosis, being contaminated by earth or dust. After an incubation period averaging two weeks (occasionally longer), the toxin produced by the clostridia confined in the wound is absorbed and starts producing its effects. Non-specific prodromal signs (fever, irritability) are then followed by the appearance of localised muscular contractions. Finally, generalised spasms may occur, leading to frequently lethal consequences, mainly cardiac and respiratory failure. The overall case fatality rate is close to 50%, depending on the clinical presentation, patient's age and medical support. Therapy is based on removal of the toxigenic focus (infected wound), administration of antibiotics and specific immunoglobulins, and intensive care support.

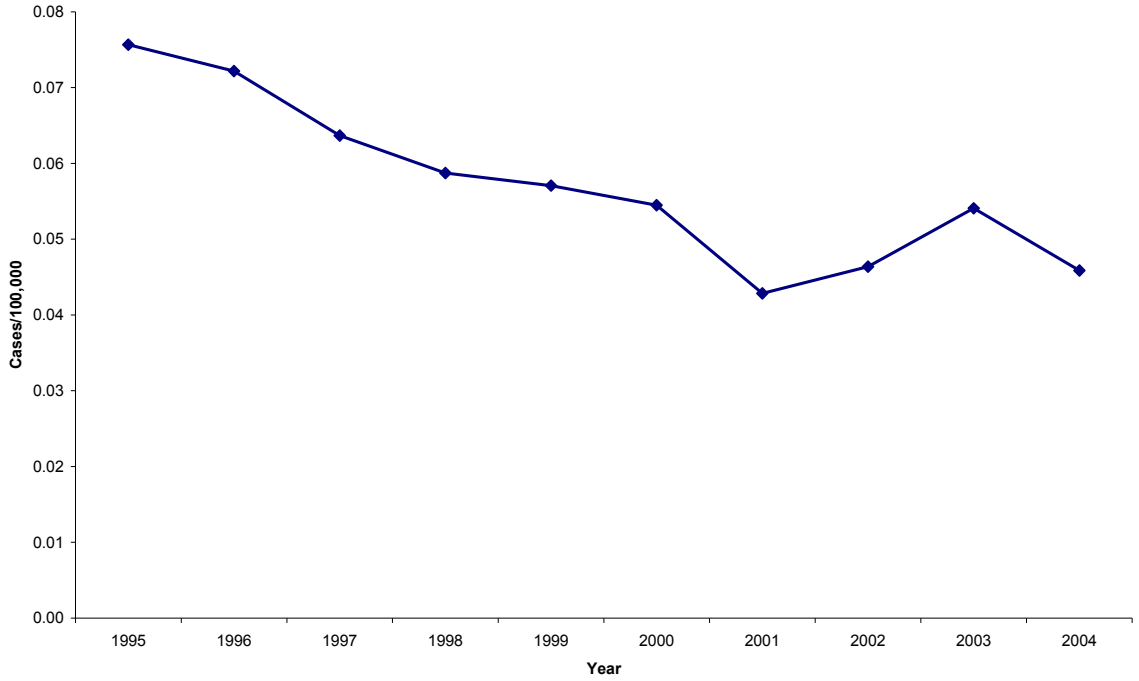
An effective, inactivated vaccine is available. Prophylaxis is based on its generalised use and on the appropriate treatment of contaminated wounds.

10-year trends

Of the 25 EU Member States, 22 provided data for the whole period and the remaining three (Finland, Germany and the Netherlands) provided data for part of this period. Norway and Iceland reported data for the entire period. Liechtenstein did not provide any data.

An overall decreasing trend is seen over the last 10 years, with a slight increase from 2001–03. The incidence rates were always below 0.2 per 100 000 in the EU15 states, except for Italy and Portugal in 1995. In the new Member States, tetanus incidence rates were below 0.35 per 100 000, except for Slovenia where incidence peaked at 0.45 per 100 000 in 2000 (nine cases) and for Malta with a peak at 0.51 per 100 000 in 2002 (only two cases).

Figure 4.39.1. Incidence rate of tetanus cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Liechtenstein.

The situation in 2005

In 2005, altogether 137 cases were reported by 21 countries. Italy reported almost 50% of all cases (n = 64) and the highest incidence rates were in Malta (0.25 per 100 000, but only one case), followed by Italy (0.11 per 100 000). The overall incidence rate for Europe was very low in 2005, 0.04 per 100000.

Table 4.39.1. Number of tetanus cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	0	0.00
Belgium	C	3	0.03
Cyprus	C	0	0.00
Czech Republic	C	0	0.00
Denmark	C	0	0.00
Estonia	C	0	0.00
Finland	—	—	—
France	C	17	0.03
Germany	C	—	—
Greece	C	5	0.02
Hungary	C	3	0.03
Ireland	—	—	—
Italy	C	64	0.11
Latvia	C	0	0.00
Lithuania	—	—	—
Luxembourg	—	—	—
Malta	C	1	0.25
Netherlands	—	—	—
Poland	C	15	0.04
Portugal	C	8	0.08
Slovakia	C	0	0.00
Slovenia	C	2	0.10
Spain	C	8	0.02
Sweden	C	1	0.01
United Kingdom	C	10	0.02
EU total		**137**	**0.04**
Iceland	C	0	0.00
Liechtenstein	—	—	—
Norway	C	0	0.00
Total		**137**	**0.04**

Source: Country reports. *C: Case-based report; —: No report.

Age and gender distribution

Nearly all of these tetanus cases were diagnosed in individuals older than 45 years (98%), of whom the majority were aged over 65 years (83%, incidence of 0.28 per 100 000). The overall incidence by gender in those cases with this information (n = 109) showed that 29% occurred in men (0.02 per 100 000) and 71% in women (0.04 per 100 000).

Seasonality

Most of the reported cases occurred in August (24%), but the small number of cases with this data (n = 38) makes any interpretation of seasonality unreliable.

Conclusions

- As 21 Member States provided data for 2005 (nine countries reporting zero cases), the 137 tetanus confirmed cases might not reflect the true epidemiological situation in the EU.
- The overall incidence for tetanus for 2005 in the EU is < 0.1 per 100 000. However, some countries, notably Italy[1], continue to report relatively high rates.

- Tetanus occurs classically in older individuals with waning immunity. This is confirmed for the reported cases in 2005 that were mostly diagnosed among individuals aged over 65 years of age.
- Recently, the United Kingdom[2] has reported a cluster of tetanus in another population group (injecting drug users) as has the Netherlands[3].

References

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3. Tetanus in an injecting drug user in the Netherlands: single case so far. Eurosurveill 2004; 8 (19): 2004/05/0.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	Tetanus	V	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide Tetanus	C	Co	P	C-B	N	Y	Y	Y	Y
Finland										
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
Germany										
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to	C	Co	P	C-B	Y	Y	N	N	Y

	registration in Iceland									
Ireland	other VPD EU case definitions	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Tetanus Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Tetanus	O	Co	P	C-B	Y	N	Y	Y	Y

4.40 Toxoplasmosis

Toxoplasma gondii is a coccidian protozoan parasite commonly causing asymptomatic infections in humans and animals. It can, however, cause life-threatening disease in immuno-compromised individuals and during pregnancy it can affect the foetus.

Cats and other felines are the reservoir. They excrete oocysts in the environment, able to infect many other animals, generating tissue cysts. Humans can become infected either by ingesting the oocysts (by direct contact with cats or ingesting objects, food or water contaminated by their faeces), or by eating poorly cooked meat containing cysts, especially pork and mutton.

The infection in immuno-competent individuals is, as a rule, asymptomatic. A self-limiting lymphadenopathy might occur. Pregnant women, though asymptomatic, may transmit the infection to the foetus, which can result in abortion, still-birth, peri-natal death (due to disseminate toxoplasmosis), or congenital occular/neurological pathology. Mothers infected during pregnancy must receive appropriate chemotherapy or antibiotic treatment (which still cannot guarantee the health of the foetus).

The infection in immuno-compromised hosts (HIV patients included) tends to seriously affect their central nervous system, but also other organs may be affected. Such patients may require prolonged (sometimes life-long) therapy.

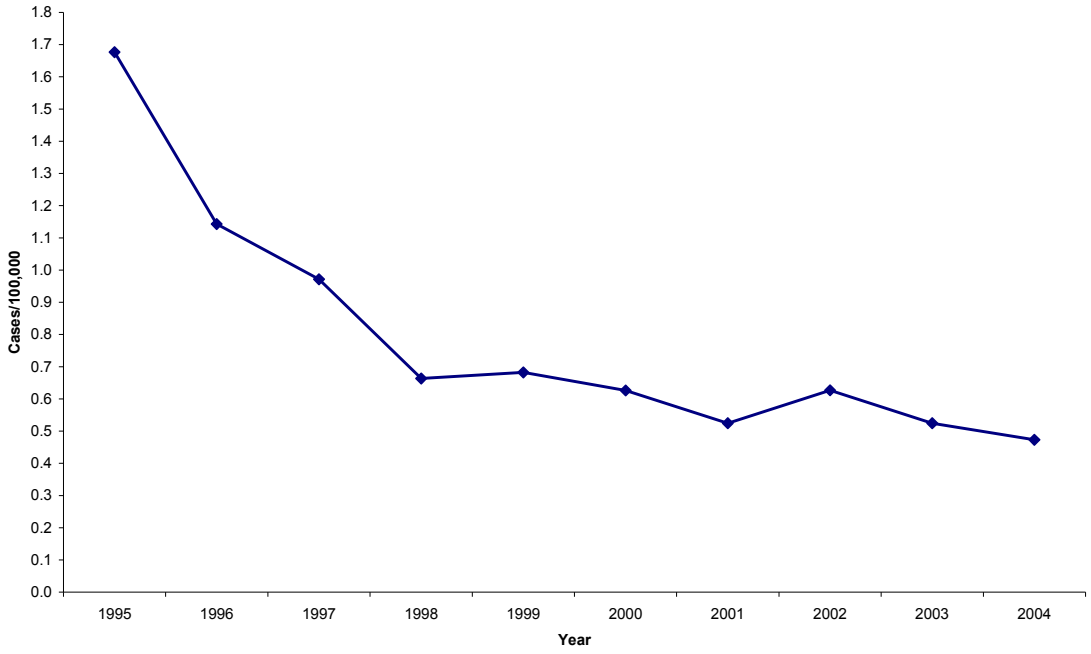
Oocysts can survive in the environment for a long time, contaminating fruit and vegetables. Cysts in meat remain infective as long as it is edible. Sero-negative pregnant women and immuno-compromised individuals will need careful counselling and laboratory follow-up.

10-year trends

Among the EU member sates, both clinical and congenital toxoplasmosis cases have been reported, although the majority of reported cases are laboratory-confirmed clinical cases (97% in 2004). There is a lot of variation in the consistency of reporting as well as in the reporting criteria. In Norway, for example, only enchephalitis cases are notifiable, while by contrast, Denmark reports congenital cases from neonatal screening, while Austria reports congenital and screening positive (pregnant women). Therefore, any trend analysis is difficult and a comparison across countries is probably impossible at this time. Of the 25 EU Member States plus Iceland, only nine countries submitted data for the whole period.

Reporting from most countries in Europe started in 1996, following the highest incidence observed in 1995 (1.68 per 100 000). Since then toxoplasmosis has shown a steadily decreasing trend over the last few years (figure 4.40.1).

Figure 4.40.1. Incidence rate of toxoplasmosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Cyprus, France, Portugal and Liechtenstein, while Toxoplasmosis is not a notifiable disease in Austria or Sweden.

The situation in 2005

In 2005, 1 519 toxoplasmosis cases were reported by 14 countries, with Lithuania (6.86 per 100 000), followed by Slovakia (4.85 per 100 000) reporting the highest incidence (see table 4.40.1). There is clearly a very large degree of under-reporting and no conclusions of the overall incidence rate for Europe (here estimated at 0.84 per 100 000) can be made on the basis of the data.

Table 4.40.1. Number of toxoplasmosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria([a])	—	—	—
Belgium	—	—	—
Cyprus	C	0	0.00
Czech Republic	C	347	3.40
Denmark	—	—	—
Estonia	A	5	0.37
Finland	—	—	—
France	—	—	—
Germany	—	—	—
Greece([b])	C	0	0.00
Hungary	C	115	1.14
Ireland	C	47	1.14
Italy	—	—	—
Latvia	C	2	0.09
Lithuania	C	235	6.86
Luxembourg	—	—	—
Malta	C	8	1.99
Netherlands	—	—	—
Poland	C	317	0.83
Portugal	—	—	—
Slovakia	C	261	4.85
Slovenia	C	19	0.95
Spain	C	48	0.11
Sweden([a])	—	—	—
United Kingdom	C	115	0.19
EU total		**1 519**	**0.84**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	—	—	—
Total		**1 519**	**0.84**

Source: Country reports. *A: Aggregated report; C: Case-based report; —: No report.

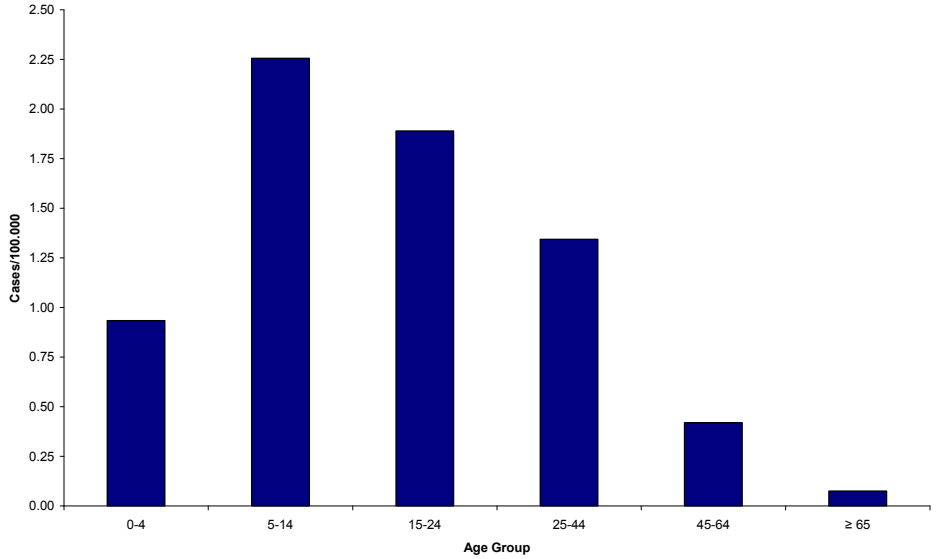
(a) Toxoplasmosis is not a notifiable disease in Austria or Sweden.

(b) Only congenital toxoplasmosis is notifiable in Greece.

Age and sex distribution

Of all the eight countries that reported information on age for toxoplasmosis cases (n = 819) the age group 5–14 years (2.26 per 100 000) followed by 25–44 years (1.89 per 100 000) had the highest incidence (figure 4.40.2). The majority of the cases with information on gender (n = 829), were reported for women (62%), probably reflecting enhanced screening among pregnant women.

Figure 4.40.2. Age-specific incidence distribution of toxoplasmosis cases for selected European countries, 2005 (n = 819)

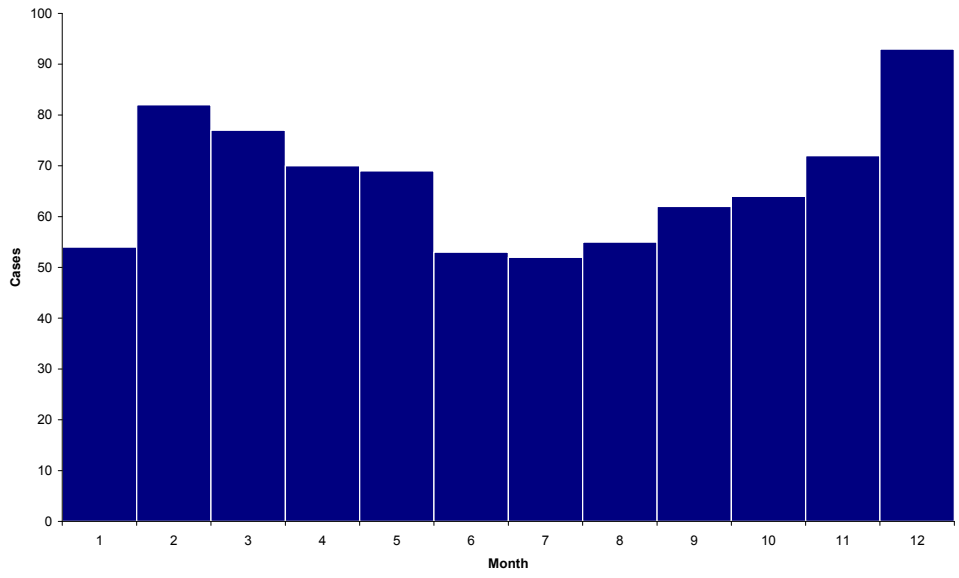


Source: Country reports. Reports with age-specific data were available from: Czech Republic, Estonia, Hungary, Ireland, Latvia, Malta, Slovakia and Spain. Toxoplasmosis is not a notifiable disease in Austria.

Seasonality

Based on the country reports that contained information about the month (eight countries, n = 803), toxoplasmosis cases occurred mainly in the winter months persisting until the end of spring.

Figure 4.40.3. Distribution of toxoplasmosis cases by month, for selected European countries, 2005 (n = 803)



Source: Country reports. Reports with seasonality data were available from: Estonia, Hungary, Ireland, Latvia, Malta, Poland, Slovakia and Spain. Toxoplasmosis is not a notifiable disease in Austria.

Conclusions

- Toxoplasmosis is known to be a very common infection but this is not well reflected in the available data.
- The wide variability in the country's reporting systems need to be harmonised before conclusions on European trends can be made with any degree of confidence.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria										
Belgium										
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	Obligatory, countrywide, based on a double system of reporting Toxoplasmosis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany										
Greece										
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of notifiable diseases in Iceland	C	Co	P	A	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy										
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance	C	Co	P	C-B	Y	Y	N	N	Y

	System									
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway										
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden										
United Kingdom	UK Toxoplasmosis	V	Co	P	C-B	Y	N	Y	Y	Y

4.41 Trichinellosis

Trichinellosis is a zoonotic disease caused by parasitic nematodes belonging to the genus *Trichinella* (mainly *Trichinella spiralis* and *Trichinella brivoti*). The disease occurs worldwide.

Many animals act as reservoirs. Those most frequently involved in cases of human infection are pigs and horses but in Europe, wild boars are also implicated.

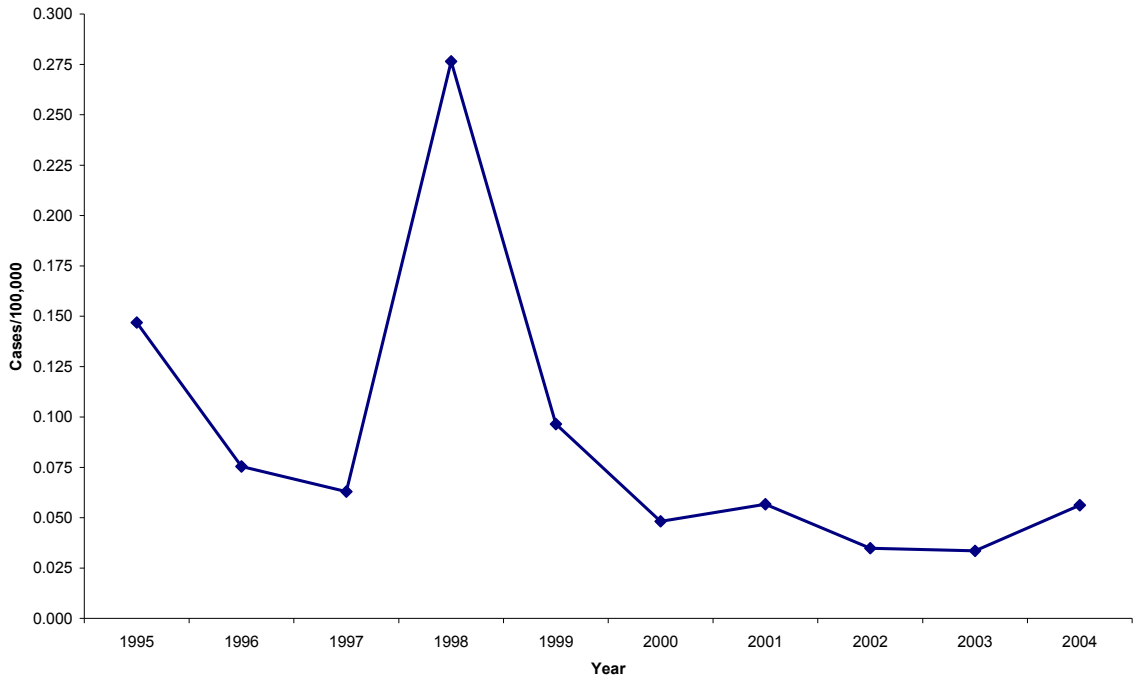
Infested animals harbour larvae encysted in their muscles. Consumption of raw or undercooked meat products may lead to disease. Typically, after an incubation phase of about 24–48 hours, fever and intestinal symptoms may appear, due to larvae invading the intestine. Then, about a week after infection, larval invasion of the muscles begins: myalgias, fever and eosinophilia are characteristic. Finally, acute symptoms recede, but muscle problems may take a long time to resolve. Depending on the number of viable larvae ingested, clinical presentations will vary from asymptomatic to extremely severe or even fatal (massive invasion of the bowel and/or massive invasion of internal organs) disease. Antihelminthic treatment is effective.

Trichinellosis prevention is based on accurate inspection of all slaughtered pigs and horses, which is mandatory in the EU. Imported and wild animal meat presents a higher risk and its consumption in the undercooked or raw state should be discouraged.

10-year trends

Data for the whole period was available from 17 Member States, while seven Member States, Norway and Iceland reported for some of the years (Cyprus and Liechtenstein did not report any cases). Over the last 10 years, the incidence of trichinellosis in Europe has shown an overall decreasing trend despite peaks in Slovakia, France and Italy in 1998, in Poland 1999, in Latvia in 2000, and in Lithuania in 2001. Since 2000, the incidence has been relatively stable.

Figure 4.41.1. Incidence rate of trichinellosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Cyprus and Liechtenstein.

The situation in 2005

In 2005, 153 cases were reported by 25 countries. Latvia (2.12 per 100 000), followed by Lithuania (0.35 per 100 000) reported the highest incidence rates. The overall incidence rate was 0.03 per 100 000.

Table 4.41.1. Number of trichinellosis cases in the EU and EEA/EFTA, 2005

Country	Report type*	Reported cases	Incidence /100 000
Austria	C	0	0.00
Belgium	—	—	—
Cyprus	C	0	0.00
Czech Republic	C	0	0.00
Denmark	C	0	0.00
Estonia	C	1	0.07
Finland	C	0	0.00
France	C	20	0.03
Germany	C	0	0.00
Greece	C	0	0.00
Hungary	C	0	0.00
Ireland	C	0	0.00
Italy	C	15	0.03
Latvia	C	49	2.12
Lithuania	C	12	0.35
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands	C	0	0.00
Poland	C	47	0.12
Portugal	C	0	0.00
Slovakia	C	0	0.00
Slovenia	C	0	0.00
Spain	C	9	0.02
Sweden	C	0	0.00
United Kingdom	C	0	0.00
EU total		**153**	**0.03**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	C	0	0.00
Total		**153**	**0.03**

Source: Country reports. *C: Case-based report; —: No report.

Age and gender distribution

Information on age groups was only supplied by four Member States with reported cases (Estonia, Italy, Poland and Spain, n = 68). The incidence was highest in the age group of 5–14 (0.07 per 100 000) followed by the age group of 45–64 (0.06 per 100 000). Data on gender was available in 88 cases. Of these, 59% of cases were male and 41% female.

Seasonality

The limited data on seasonality (n = 53) were available from three EU Member States (Estonia, Poland and Spain). According to the data on seasonal distribution, nearly all the cases occurred in

December and January. These peaks in December and January are mainly influenced by the Polish data and most likely reflect potential outbreaks.

Conclusions

- Trichinellosis cases are relatively rare but outbreaks still occur.
- The most affected age groups are young adults in the 15–24 year and adults 45–64 year age groups.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium										
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y

Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Trichinosis Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Trichinosis	V	Co	P	C-B	Y	N	Y	Y	Y

4.42 Tuberculosis (*Mycobacterium tuberculosis* complex)

Tuberculosis (TB) is a bacterial disease which affects different human organs, but primarily the lung. It is most commonly acquired via inhalation of bacteria belonging to the *Mycobacterium tuberculosis* complex (*M. tuberculosis, M. africanum, M. bovis, M. Microti, M. Carnetti*) in droplets produced by another person with pulmonary disease. It can also be acquired, though less frequently, by ingesting contaminated milk or through laboratory contamination. Only 5–10% of infected persons go on to develop active TB. HIV infection increases the likelihood of progression while preventive therapy reduces this risk. The BCG vaccine is effective in limiting severe disease in childhood but has little effect on transmission. Therefore, TB control relies mainly on the early detection of infectious patients and then consistent treatment for at least six months with a combination of antibiotics. Inadequate treatment may result in failure of cure, early relapse or the development of drug-resistant disease.

In 2005, 426 717 cases were notified in the WHO European Region, representing 8% of all notifications to WHO worldwide that year[1]. Within the region, 86% of cases were reported from outside the EU, mostly by the eastern countries of the former Soviet Union (FSU) which have high TB incidence (figure 4.42.1)[2]. FSU countries, including the three Baltic States now members of the EU (Estonia, Latvia, and Lithuania), are also associated with a higher frequency of drug-resistant TB. The emergence of strains resistant to the two most effective anti-TB agents isoniazid and rifampicin (multi-drug resistant, MDR), as well as to other second line antibiotics (extensively drug-resistant, XDR), poses a serious challenge to TB control today[3]. Within the EU, TB is more prevalent in migrants, the homeless, prisoners and drug users than in other sectors of the population.

Figure 4.42.1. Incidence rate of tuberculosis (cases/100 000 population), WHO European Region, 2005

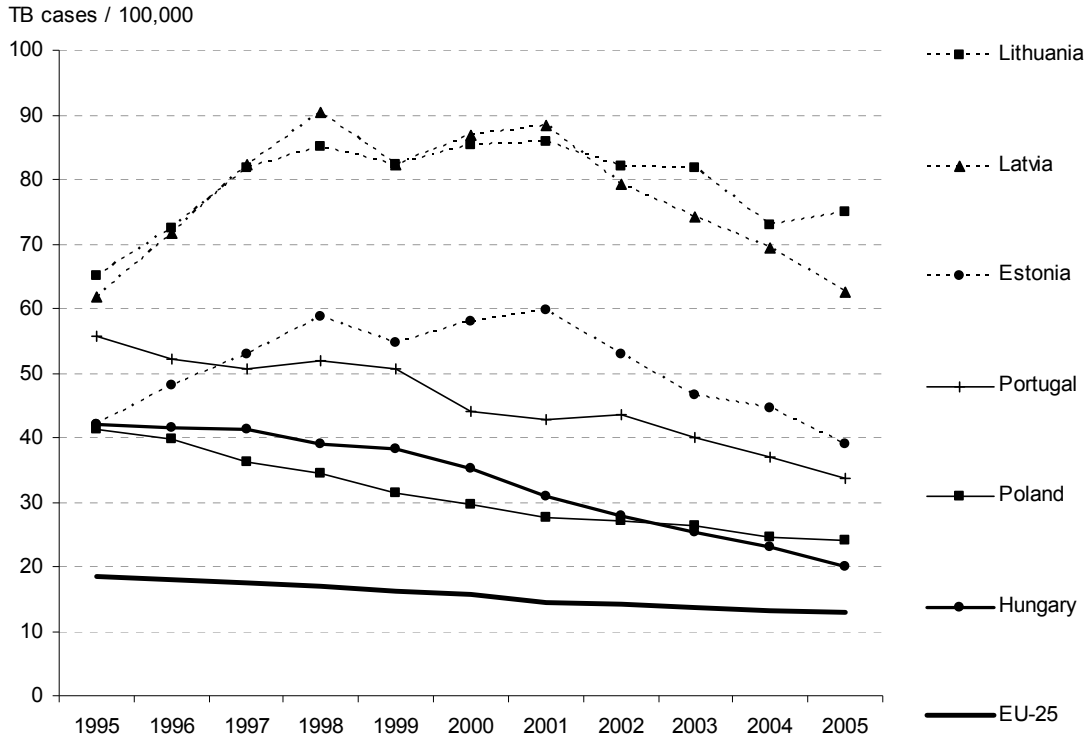
Source: EuroTB.

The collection of TB surveillance data in the European Region has been coordinated through the EuroTB network since 1996. Contact points in each country send data according to standardised specifications[5,6,7]. TB data discussed in this section were provided by EuroTB. The description of surveillance systems is based on a survey conducted by ECDC in 2006.

10-year trends

In the early 1990s, a number of EU countries experienced an increase or stabilisation in their TB notification rates. Subsequently, rates declined in most countries and have reached very low levels in recent years. In the Baltic States, in contrast, rates increased in the late 1990s, but have decreased since 2001 (figure 4.42.2, table 4.42.2). In Sweden and United Kingdom, overall rates have increased substantially between 2001 and 2005, largely as a result of TB in immigrants.

Figure 4.42.2. Incidence rate of TB in countries with ≥20 cases/100 000 population compared to the mean rate for the EU25, 1995–2005



Source: EuroTB.

With the exception of the Baltic States, Hungary, Poland and Portugal, rates have remained below 20 cases per 100 000 population since 2001 in all countries.

The situation in 2005

In 2005, the 25 EU countries plus Iceland and Norway reported 59 497 TB cases, corresponding to an overall rate of 12.8 per 100 000 population, with a countrywide range from 4 to 75 (table 4.42.1). Five countries (France, Germany, Poland, Spain and United Kingdom) had more than 5 000 cases each, between them accounting for 62% of all cases reported. With the EU expansion in 2007, Romania will be the country with the highest notification rate (135 per 100 000 in 2005) and effectively increase total notifications in the EU27 by one half.

TB is more common in males than females (male:female ratio in 2005 = 1.7). Cases aged over 64 years accounted for 22% of overall cases, while children under 14 represented 4% (figure 4.42.3, table 4.42.3). The mean age is lower in western countries like Denmark, the Netherlands, Sweden and United Kingdom where foreign-born individuals nowadays represent the majority of notified cases (table 4.42.1). In persons of foreign origin, TB is concentrated in young adults while in the autochthonous population, rates increase slowly with age and are highest in the elderly (figure 4.42.3). Cases of foreign origin accounted for 30% of all cases reported in the 25 countries (country

range: 0–78%). Most cases of foreign origin were from Africa, Asia or from a non-EU country within the European region. In countries with higher overall rates, the proportion of foreigners tended to be lower, suggesting that local transmission was relatively important.

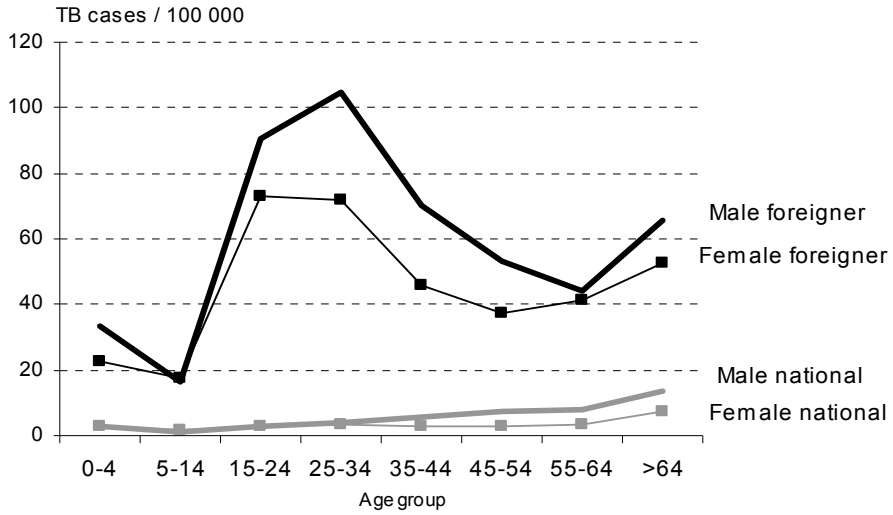
Table 4.42.1. Number and incidence rate of all TB cases, and cases of foreign origin*, 2005

Country	Cases		Foreign-born	
	N	/100 000	N	%
Austria	954	11.6	420	44%
Belgium	1 144	11.0	581	51%
Cyprus	37	4.4	25	68%
Czech Republic	1 007	9.9	130	13%
Denmark	424	7.8	258	61%
Estonia	519	39.0	84	16%
Finland	361	6.9	36	10%
France	5 374	8.6	2 433	45%
Germany	6 045**	7.3	2 622	45%**
Greece	767	6.9	219	29%
Hungary	2 024	20.0	62	3%
Ireland	461	11.1	142	31%
Italy	4 137	7.1	1 809	44%
Latvia	1 443	62.5	84	6%
Lithuania	2 574	75.0	88	3%
Luxembourg	37	8.0	25	68%
Malta	23	5.7	17	74%
Netherlands	1 157	7.1	764	66%
Poland	9 280	24.1	17	0%
Portugal	3 536	33.7	413	12%
Slovakia	760	14.1	27	4%
Slovenia	278	14.1	48	17%
Spain	7 820	18.2	1 448	19%
Sweden	569	6.3	415	73%
United Kingdom	8 465	14.2	5 392	64%

EU total	**59 196**	**12.8**	**17 559**	**30%**
Iceland	11	3.7	7	64%
Norway	290	6.3	226	78%
All countries	**59 497**	**12.8**	**17 792**	**30%**

Source: EuroTB. *Origin defined by citizenship rather than birth. **Information on country of birth only available for 5 799 cases.

Figure 4.42.3. Age-sex specific incidence rates of TB cases for selected European countries, 2004



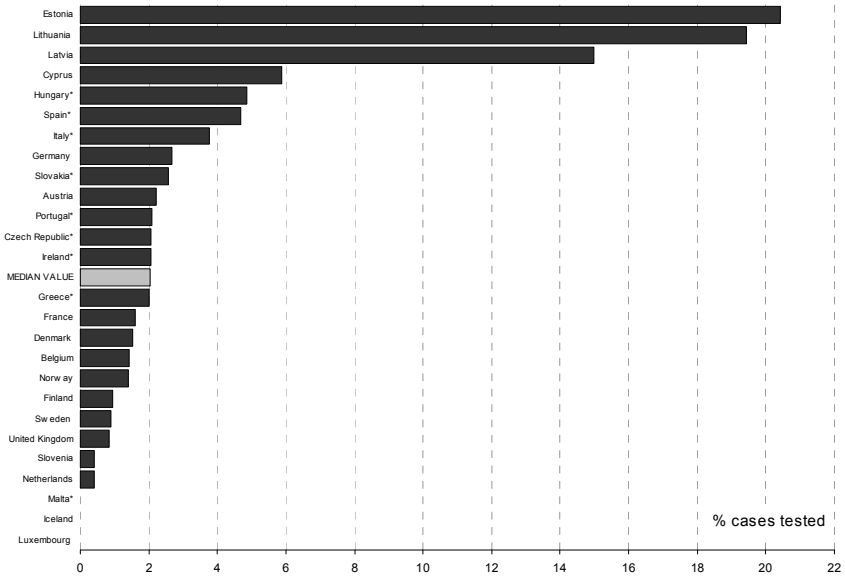
Source: EuroTB. Data from Austria, Belgium, Denmark, Finland, France, Germany, Iceland, the Netherlands, Norway, Slovenia, Sweden and United Kingdom.

In the EU in 2005, 22% of AIDS cases had TB as an initial AIDS-indicator illness. The contribution of HIV to the TB case-load differs between countries. While 15% of TB cases in Portugal were HIV positive, the prevalence was much lower in the other countries that provided data. However, a doubling in prevalence has been seen in the United Kingdom over the period 2000–03 (from 4.2% to 8.3%) associated with recent migration and this has remained rather elevated. HIV prevalence among TB cases has also increased since 2000 in Estonia and Latvia, reaching 6.4% and 3.5% respectively in 2005.

TB prevention and treatment

The role of the laboratory in confirming disease and in detecting drug-resistance is pivotal in TB surveillance. Multi-drug resistance was present in 15–20% of cases tested in 2005 in the Baltic States, but ranged from 0 to 6% in the rest of the countries (figure 4.42.4). MDR is more frequent in previously treated cases, and in foreigners, especially those originating from the FSU[8].

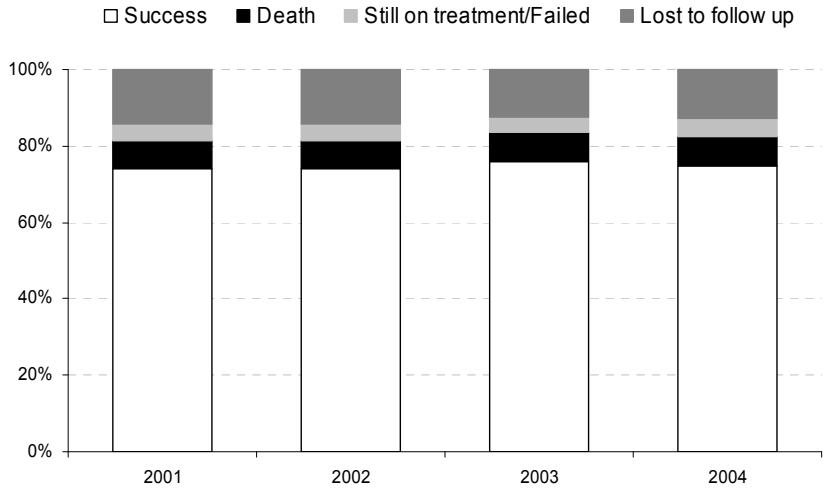
Figure 4.42.4. Proportion of multi-drug resistance in TB cases* in Europe, 2005



Source: EuroTB. *Culture or drug-susceptibility testing not done routinely, or results incomplete.

Data from EuroTB show that TB cases with pulmonary disease had a lower likelihood of completing their treatment successfully and a higher risk of dying, compared with cases with extra-pulmonary TB (71% and 9% respectively, versus 77% and 5% in 2004). Pulmonary TB cases of foreign origin were more likely to be lost to follow up and less likely to die than nationals (21% and 4% respectively, versus 12% and 11%). The likelihood of having a successful outcome of treatment decreased with age as the risk of dying increased. Among the previously untreated pulmonary TB cases notified in 2004, 75% overall had had a successful outcome before the end of a 12-month period, and 7% had died. Six countries achieved or surpassed the WHO global target of 85% success[4]. Between 2001 and 2004, a slight improvement in success ratio was noted in 10 of 20 countries (figure 4.42.5, pooled data).

Figure 4.42.5. Treatment outcomes for previously untreated pulmonary TB cases* in selected European countries, 2001–2004



Source: EuroTB. *Culture-confirmed cases (smear positive in Sweden). Excluding Cyprus, Finland, France, Greece, Italy, Luxembourg, Spain.

Conclusions

- The EU countries today fall into three broad patterns with respect to TB:

– Western, industrialised countries where TB rates are low and disease increasingly aggregates in immigrants and in sub-groups and settings associated with poverty and lowered immunity. Drug resistance is low but usually higher in cases of foreign origin. HIV among TB cases varies from low to high.

– The Baltic States, characterised by high TB rates, high mortality, low migrant TB, high drug resistance and where levels of HIV are increasing among TB patients.

– The countries in central Europe which joined the EU in 2004, several of which border FSU countries, in which TB rates are moderate to high but on the decline, and cases of foreign origin, HIV co-morbidity and drug resistance are as yet uncommon.

- The case definition for notifiable TB will modified in 2007 to accommodate three levels of ascertainment, namely 'possible' (clinical and/or radiological features alone), 'probable' (if there is additional evidence from histology or bacilli on microscopy), or 'confirmed' (by nucleic acid detection in sputum or by culture). This should help make the epidemiological picture even clearer for policy makers.

- A wider participation of countries in surveillance of drug resistance is needed to ensure better monitoring of this public health concern.

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Table 4.42.2. TB notification rates (cases/100 000), EU25 plus Iceland and Norway, 1995–2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	17.2	18.4	17.3	16.1	15.4	15.1	13.3	13.2	12.0	13.0	11.6
Belgium	13.6	13.3	12.4	11.7	12.4	12.7	12.8	12.5	10.8	11.5	11.0
Cyprus	4.9	3.2	6.2	5.9	5.0	4.2	5.0	2.5	4.3	3.6	4.4
Czech Republic	17.9	18.8	17.8	17.5	15.9	14.0	13.2	11.7	11.4	10.3	9.9
Denmark	8.6	9.2	10.5	10.0	10.1	10.3	9.5	7.8	7.3	7.1	7.8
Estonia	42.0	48.0	53.0	58.8	54.7	57.9	59.8	52.9	46.5	44.5	39.0
Finland	13.0	12.6	11.1	12.2	11.0	10.4	9.5	9.1	7.9	6.3	6.9
France	14.6	12.7	11.3	11.0	11.0	11.0	10.6	10.3	9.9	8.9	8.6
Germany	14.9	14.4	13.6	12.7	12.1	11.0	9.1	9.3	8.7	7.9	7.3
Greece	8.8	8.8	7.1	10.6	8.7	6.4	5.6	5.3	5.6	7.0	6.9
Hungary	42.0	41.5	41.2	38.9	38.2	35.2	30.9	27.9	25.4	23.1	20.0
Iceland	4.5	4.1	3.7	6.2	4.3	4.6	4.6	2.8	1.7	4.1	3.7
Ireland	12.7	11.9	11.3	11.4	12.5	10.6	10.5	10.4	10.2	10.6	11.1
Italy	9.1	9.0	9.0	8.3	7.7	8.2	7.8	7.3	7.8	7.3	7.1
Latvia	61.7	71.6	82.4	90.5	82.3	86.9	88.3	79.2	74.1	69.4	62.5
Lithuania	65.1	72.4	81.8	85.0	82.4	85.2	85.9	82.0	81.7	73.0	75.0
Luxembourg	7.9	8.8	9.1	10.4	9.8	10.1	7.3	7.2	11.9	6.8	8.0
Malta	2.6	7.6	2.9	4.1	5.7	4.6	4.1	6.1	1.8	4.8	5.7
Netherlands	10.5	10.8	9.5	8.5	9.7	8.8	9.0	8.7	8.2	8.3	7.1
Norway	5.4	4.9	4.6	5.5	6.1	5.3	6.4	5.5	7.4	6.6	6.3
Poland	41.3	39.8	36.1	34.4	31.5	29.7	27.6	27.1	26.2	24.6	24.1
Portugal	55.6	52.2	50.7	51.9	50.7	44.0	42.8	43.6	39.9	36.9	33.7
Slovakia	28.7	27.9	24.1	23.8	22.6	20.6	19.9	19.5	18.2	13.1	14.1
Slovenia	26.7	28.6	24.4	22.8	22.3	19.3	18.9	17.8	14.9	13.4	14.1
Spain	22.0	20.8	23.3	22.6	20.8	20.6	18.1	18.3	17.7	18.2	18.2
Sweden	6.4	5.6	5.1	5.0	5.6	5.2	4.8	4.6	4.5	5.1	6.3
United Kingdom	10.7	10.8	10.9	10.6	10.7	11.5	11.9	12.3	12.1	12.8	14.2
EU25	18.5	17.9	17.4	16.9	16.1	15.6	14.5	14.2	13.7	13.1	12.8
All countries	18.3	17.8	17.3	16.8	16.0	15.5	14.4	14.1	13.6	13.0	12.8

Source: EuroTB.

Table 4.42.3. TB notifications by age groups, EU25 plus Iceland and Norway, 2005

	0–4	5–14	15–24	25–34	35–44	45–54	55–64	>64	Unknown	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Austria	22 (2)	18 (2)	138 (14)	163 (17)	139 (15)	156 (16)	115 (12)	200 (21)	3 (0)	954
Belgium	42 (4)	31 (3)	156 (14)	255 (22)	158 (14)	121 (11)	108 (9)	273 (24)	0 (0)	1 144
Cyprus	3 (8)	0 (0)	11 (30)	9 (24)	5 (14)	2 (5)	1 (3)	6 (16)	0 (0)	37
Czech Republic	2 (0)	4 (0)	48 (5)	108 (11)	139 (14)	167 (17)	163 (16)	376 (37)	0 (0)	1 007
Denmark	11 (3)	27 (6)	50 (12)	84 (20)	100 (24)	67 (16)	46 (11)	39 (9)	0 (0)	424
Estonia	0 (0)	1 (0)	38 (7)	95 (18)	105 (20)	134 (26)	78 (15)	68 (13)	0 (0)	519
Finland	0 (0)	5 (1)	20 (6)	22 (6)	28 (8)	44 (12)	51 (14)	191 (53)	0 (0)	361
France	131 (2)	171 (3)	612 (11)	1 032 (19)	877 (16)	736 (14)	570 (11)	1 245 (23)	0 (0)	5 374
Germany	126 (2)	104 (2)	496 (8)	967 (16)	993 (16)	900 (15)	747 (12)	1 712 (28)	0 (0)	6 045
Greece	15 (2)	47 (6)	68 (9)	123 (16)	94 (12)	81 (11)	74 (10)	218 (28)	47 (6)	767
Hungary	3 (0)	2 (0)	55 (3)	161 (8)	316 (16)	564 (28)	408 (20)	515 (25)	0 (0)	2 024
Iceland	0 (0)	0 (0)	0 (0)	4 (36)	3 (27)	0 (0)	1 (9)	3 (27)	0 (0)	11
Ireland	12 (3)	15 (3)	71 (15)	93 (20)	72 (16)	52 (11)	52 (11)	93 (20)	1 (0)	461
Italy	74 (2)	88 (2)	434 (10)	915 (22)	671 (16)	443 (11)	359 (9)	1 038 (25)	115 (3)	4 137
Latvia	32 (2)	36 (2)	129 (9)	265 (18)	339 (23)	316 (22)	185 (13)	141 (10)	0 (0)	1 443
Lithuania	18 (1)	72 (3)	199 (8)	358 (14)	584 (23)	590 (23)	377 (15)	375 (15)	1 (0)	2 574
Luxembourg	1 (3)	0 (0)	1 (3)	10 (27)	8 (22)	6 (16)	7 (19)	4 (11)	0 (0)	37
Malta	0 (0)	0 (0)	7 (30)	7 (30)	2 (9)	1 (4)	1 (4)	5 (22)	0 (0)	23
Netherlands	18 (2)	33 (3)	182 (16)	268 (23)	199 (17)	154 (13)	98 (8)	195 (17)	10 (1)	1 157
Norway	5 (2)	13 (4)	63 (22)	80 (28)	44 (15)	28 (10)	14 (5)	43 (15)	0 (0)	290
Poland	26 (0)	73 (1)	540 (6)	925 (10)	1 414 (15)	2 368 (26)	1 397 (15)	2 537 (27)	0 (0)	9 280
Portugal	44 (1)	57 (2)	352 (10)	838 (24)	831 (24)	542 (15)	318 (9)	539 (15)	15 (0)	3 536
Slovakia	7 (1)	15 (2)	30 (4)	81 (11)	91 (12)	129 (17)	133 (18)	274 (36)	0 (0)	760
Slovenia	2 (1)	5 (2)	20 (7)	33 (12)	47 (17)	49 (18)	28 (10)	94 (34)	0 (0)	278
Spain	299 (4)	199 (3)	934 (12)	1 865 (24)	1 571 (20)	930 (12)	584 (7)	1 384 (18)	54 (1)	7 820
Sweden	23 (4)	15 (3)	77 (14)	133 (23)	102 (18)	55 (10)	39 (7)	125 (22)	0 (0)	569
United	170	293	1 297	2 350 (28)	1 491	904 (11)	663 (8)	1 295	2 (0)	8 465

Kingdom	(2)	(3)	(15)		(18)			(15)		
EU25	**1 081 (2)**	**1 311 (2)**	**5 965 (10)**	**11 160 (19)**	**10 376 (18)**	**9 511 (16)**	**6 602 (11)**	**12 942 (22)**	**248 (0)**	**59 196**
All countries	**1 086 (2)**	**1 324 (2)**	**6 028 (10)**	**11 244 (19)**	**10 423 (18)**	**9 539 (16)**	**6 617 (11)**	**12 988 (22)**	**248 (0)**	**59 497**

Source: EuroTB.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	TUBERKULOSEGESETZ 1968	C	Co	A	C-B	Y	Y	Y	Y	Y
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 b	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Surveillance by TB agencies	C	Co	A	C-B	Y	Y	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	Register of tuberculosis	C	Co	P	C-B	Y	Y	Y	Y	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting TBC	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y

Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Tuberculosis surveillance	C	Se	P	C-B	Y	Y	N	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	legionella and TB	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	TB surveillance system	C	Co	P	C-B	Y	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Tuberculosis Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Tuberculosis	O	Co	A	C-B	Y	N	Y	Y	Y

4.43 Tularaemia

Tularaemia is a zoonosis, caused by the bacterium *Francisella tularensis*. Natural reservoirs are many types of animals, mainly rabbits, hares, squirrels, foxes and ticks. The latter play an important role both as reservoirs (trans-ovaric passage occurs) and as transmitters of infection.

Human infection can occur through a variety of mechanisms, the most important of which is through bites of infected arthropods (ticks, mosquitoes and flies). Other modalities are direct contact with, or ingestion of, water, food, or soil contaminated by animal carcasses; handling animal tissues or fluids or the ingestion of undercooked infected meat; and on rare occasions inhalation of infective aerosols.

A high fever and prostration appear abruptly after an incubation period of about 3–5 days. Clinical presentations vary with the portal of entry, and include: ulceroglandular, glandular, occuloglandular, oropharyngeal, pneumonic (including interstitial pneumonia), typhoidal and septic forms. Response to antibiotic treatment is usually good, and fatal outcomes are rare in Europe (European *Francisella tularensis* strains are less pathogenic than North American strains).

General preventive measures include the avoidance of tick bites, avoiding drinking potentially contaminated water, and ensuring that rabbit and hare meat is cooked thoroughly. Live-attenuated vaccines can be used to protect workers at occupational risk.

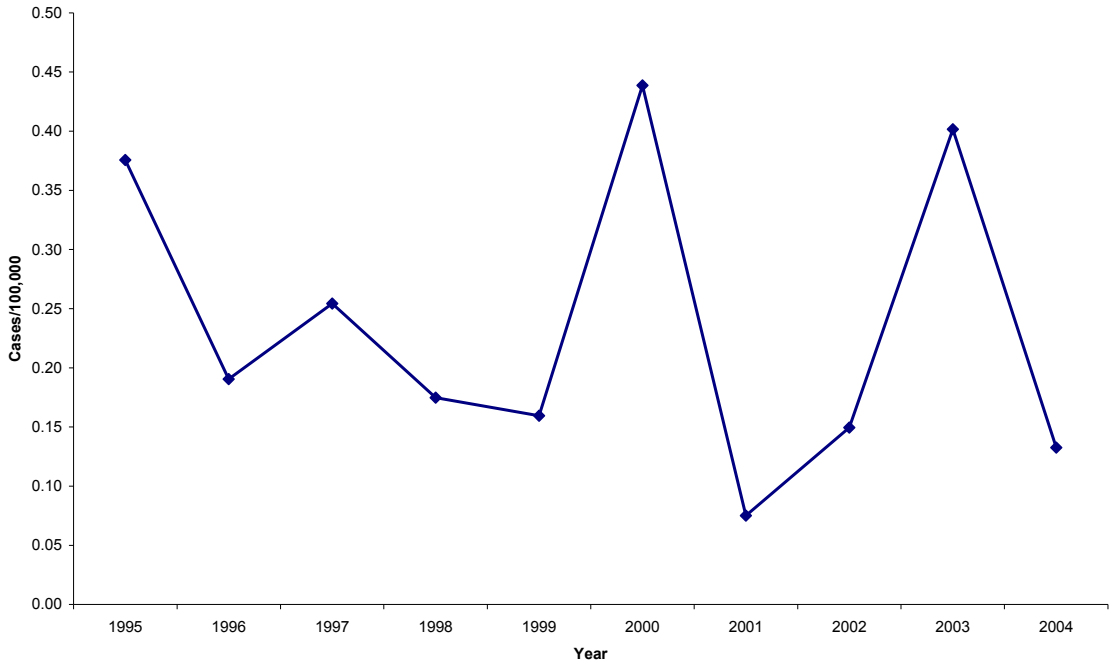
Francisella tularensis is a hardy non-spore-forming organism, capable of surviving for weeks at low temperatures in water, moist soil, hay, straw or animal carcasses. As such, it has been considered as an agent that could be intentionally released, for which the European Commission has issued European clinical guidelines.

10-year trends

Complete data for the whole period was only available from 12 Member States and Norway, while another 11 Member States and Iceland provided data for at least some of the years. Cyprus, Portugal and Liechtenstein did not provide any data.

Over the last 10 years the reported number of cases in the EU has been very variable, but the overall trend appears to be stable (figure 4.43.1). Finland and Sweden were the countries reporting the most cases over the last 10 years and trends for both countries appear to be increasing, but more so in Sweden. Still, this is not just a problem of the north, as Spain, for example, reported one outbreak involving 585 cases in 1997.

Figure 4.43.1. Incidence rate of tularaemia cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Cyprus, Portugal and Liechtenstein.

The situation in 2005

In 2005, 508 cases were reported by 21 countries. Sweden (2.73 per 100 000), followed by Hungary (0.86 per 100 000) reported the highest incidence rates (table 4.43.1). The overall incidence rate for Europe was estimated at 0.12 per 100 000.

Table 4.43.1. Number of tularaemia cases in the EU and EEA/EFTA, 2005

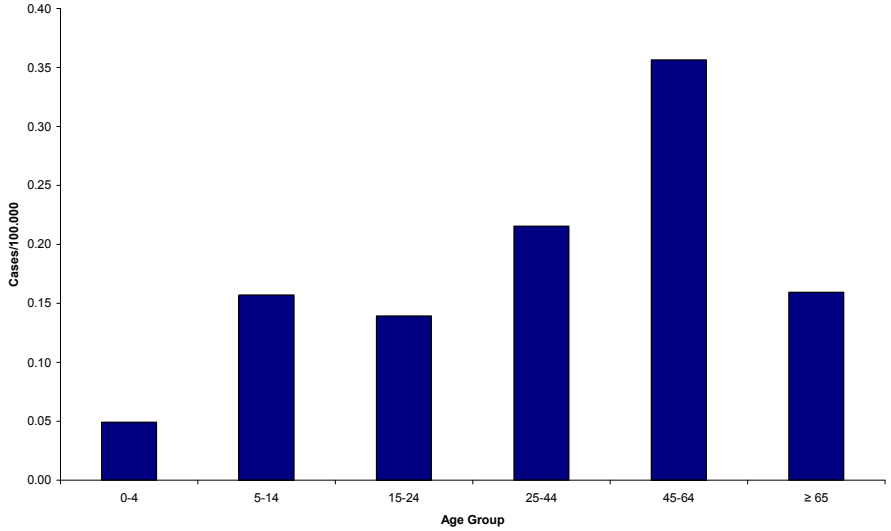
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	6	0.07
Belgium	—	—	—
Cyprus	C	0	0.00
Czech Republic	C	83	0.81
Denmark	—	—	—
Estonia	C	0	0.00
Finland	—	—	—
France	C	23	0.04
Germany	C	15	0.02
Greece	C	0	0.02
Hungary	C	87	0.86
Ireland	C	0	0.00
Italy	C	2	0.00
Latvia	C	0	0.00
Lithuania	C	0	0.00
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands	—	—	—
Poland	C	3	0.01
Portugal	—	—	—
Slovakia	C	23	0.43
Slovenia	C	1	0.05
Spain	C	0	0.00
Sweden	C	246	2.73
United Kingdom	C	0	0.00
EU total		**489**	**0.12**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	C	19	0.41
Total		**508**	**0.12**

Source: Country reports. *C: Case-based report; —: No report.

Age and gender distribution

Information about age distribution was only available for eight countries (figure 4.43.2). The most affected group was the 45–64 year olds (0.36 per 100 000). Of the 478 cases for which data on gender was available, 64% were in men. Some higher risk occupations or activities in the open air may be more common in this affected population age group.

Figure 4.43.2. Age-specific incidence distribution of tularaemia cases for selected European countries, 2005, (n = 478)

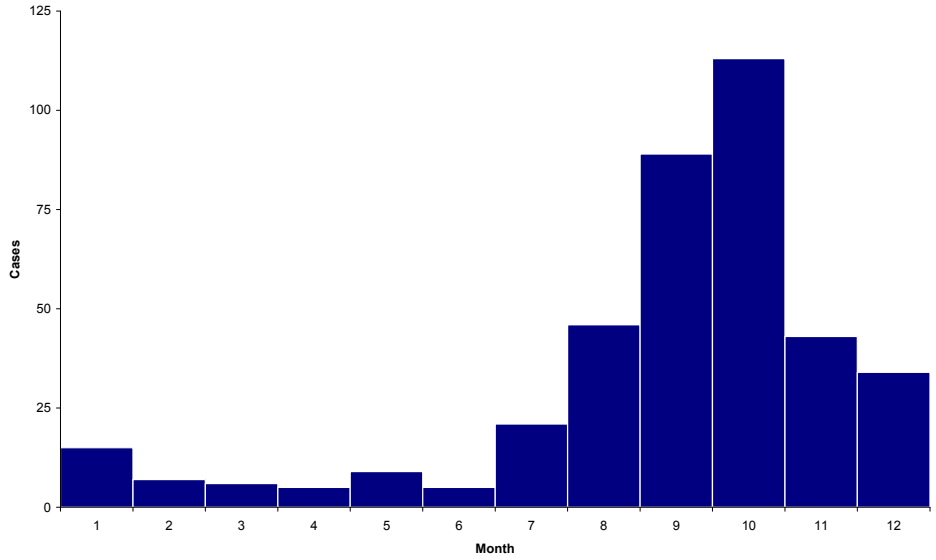


Source: Country reports. Reports with age-specific data were available from: Czech Republic, Germany, Hungary, Italy, Poland, Slovakia, Sweden and Norway.

Seasonality

There is a clear seasonal pattern in the data reported by the seven countries providing information on month of occurrence. The number of cases increased as the summer progressed, reaching a peak in October (figure 4.43.2).

Figure 4.43.3. Distribution of tularaemia cases by month, for selected European countries, 2005, (n = 393)



Source: Country reports. Reports with seasonal data were available from: Germany, Hungary, Poland, Portugal, Slovakia, Sweden and Norway.

Conclusions

- No deaths from tularaemia were reported to the EU level.
- There are a significant number of tularaemia cases reported each year, from all over Europe.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium										
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y

Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Tularaemia	V	Co	P	C-B	Y	N	Y	Y	Y

4.44 Typhoid/paratyphoid fever

Typhoid and paratyphoid fevers are systemic diseases caused by the bacteria *Salmonella typhi* and *Salmonella paratyphi* (types A, B or C), respectively. Humans are the only reservoir for *Salmonella typhi*, which is the most pathogenic, whereas *Salmonella paratyphi* types B and C also have animal reservoirs.

Humans can be either acute or chronic enteric carriers of such bacteria, which are then transmitted via the oral-faecal route (either directly or via food or water contamination). Following an incubation period averaging 1–2 weeks, disease characterised by high fever, malaise, cough, exanthemas, splenomegaly and pancytopenia develops. Diarrhoea may be present at some stage. When *Salmonella typhi* is the cause, intestinal perforation and haemorrhage may occur. *Salmonella typhi* bacteremia can also generate septic foci in all organs. Antibiotic therapy has radically changed the prognosis of typhoid, which, untreated, has a 10% case fatality rate.

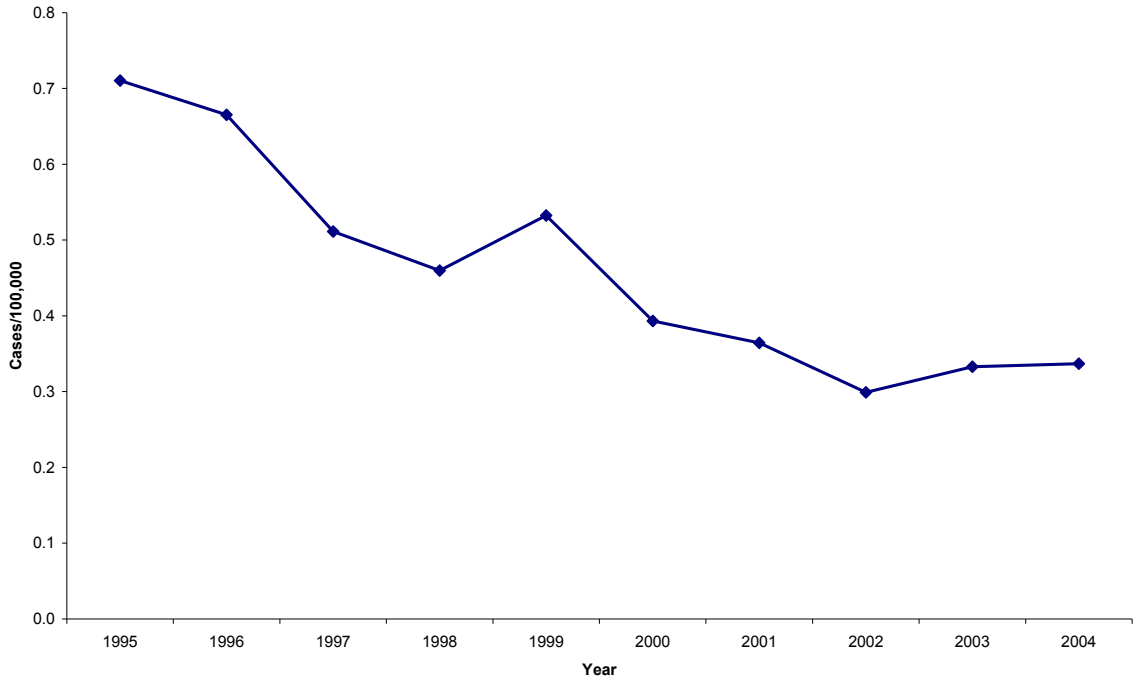
Preventive measures include good personal and food hygiene. An effective vaccine is also available.

10-year trend

Twenty-three Member States and Norway submitted data for the full period, while another two Member States and Iceland sent data for some of the years.

The overall incidence rate of typhoid/paratyphoid fever has been steadily declining since 1995 (figure 4.44.1). The highest proportion (31%) of all reported cases (n = 20 746), was reported by Italy between 1995 and 2004 (6 440 cases).

Figure 4.44.1. Incidence rate of typhoid/paratyphoid cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat.

The situation in 2005

In 2005, a total of 1 364 human typhoid/paratyphoid cases were reported by 26 countries. Norway, with 0.87 per 100 000, reported the highest incidence rate, followed by the UK (0.79 per 100 000). The overall incidence rate was 0.03 per 100 000.

Table 4.44.1. Number of typhoid/paratyphoid cases in the EU and EEA/EFTA, 2005

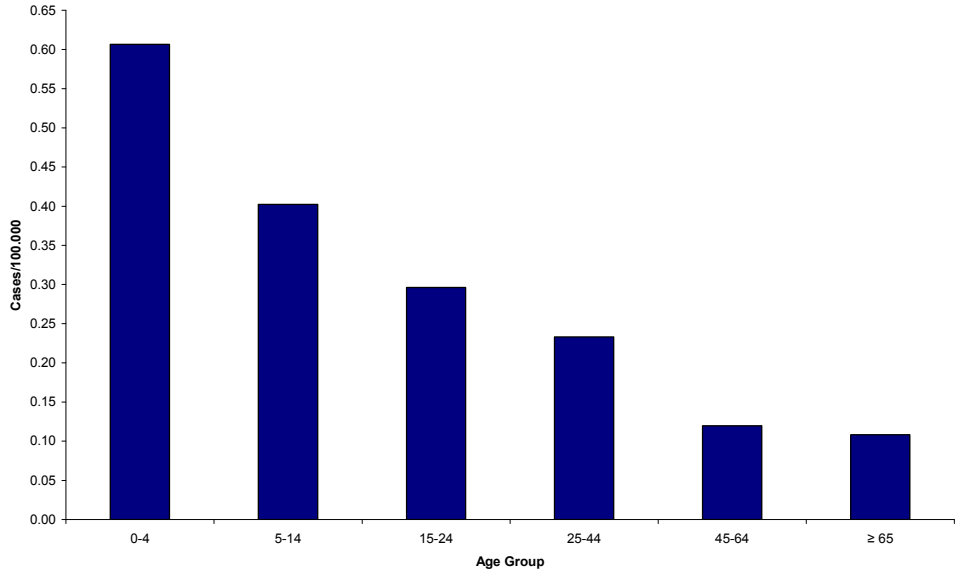
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	13	0.16
Belgium	C	60	0.57
Cyprus	C	5	0.67
Czech Republic	C	5	0.05
Denmark	C	39	0.72
Estonia	C	1	0.07
Finland	—	—	—
France	C	120	0.19
Germany	C	131	0.16
Greece	C	17	0.15
Hungary	C	3	0.03
Ireland	C	5	0.12
Italy	C	232	0.40
Latvia	C	1	0.04
Lithuania	C	4	0.12
Luxembourg	C	0	0.00
Malta	C	1	0.25
Netherlands	C	35	0.21
Poland	C	6	0.02
Portugal	C	74	0.70
Slovakia	C	1	0.02
Slovenia	C	0	0.00
Spain	C	70	0.16
Sweden	C	29	0.32
United Kingdom	C	472	0.79
EU total		**1 324**	**0.29**
Iceland	C	0	0.00
Liechtenstein	—	—	—
Norway	C	40	0.87
Total		**1 364**	**0.30**

Source: Country reports. *C: Case-based report; —: No report.

Age and gender distribution

Age-related data was available from 15 Member States, Iceland and Norway (n = 590). The highest incidence of 0.61 per 100 000 was reported in the age group ≤ 4 years followed by the age group 5–14 years (0.40 per 100 000). Cases with data on gender was available from 15 Member States and Norway (n = 590) and this showed that there was no marked difference between women (47%) and men (53%).

Figure 4.44.2. Age-specific incidence distribution of typhoid/paratyphoid cases for selected European countries, 2005 (n = 590)

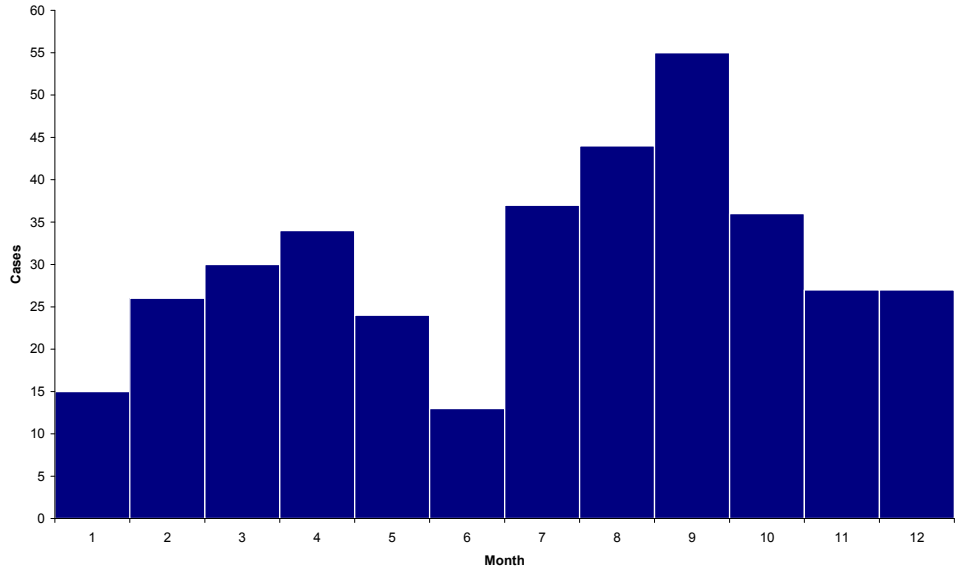


Source: Country reports. Reports with age-specific data were available from: Austria, Cyprus, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Malta, Portugal, Slovakia, Spain, Sweden, Iceland and Norway.

Seasonality

The number of reported cases shows a biphasic pattern with highest number of reported cases in August and September and another (smaller) peak in March and April (figure 4.44.3).

Figure 4.44.3. Distribution of typhoid/paratyphoid cases by month, for selected European countries, 2005 (n = 368)



Source: Country reports. Reports with seasonal data were available from: Austria, Cyprus, Estonia, Germany, Greece, Hungary, Ireland, Latvia, Malta, Poland, Portugal, Slovakia, Spain, Sweden and Norway.

Conclusions

- The trend of incidence of typhoid/paratyphoid fever is declining in EU.
- The disease affects mostly the younger age groups (≤ 4 years).
- Data from other sources suggest that the majority of cases are believed to be imported.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	obligatory, countrywide, based on a double system of reporting Anthrax, Cholera, Diphtheria, Malaria, Smallpox, Trichinosis. Tularaemia, Typhoid fever	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1 and 6	C	Co	P	C-B	Y	Y	Y	Y	N
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y

Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	ENTERNET	V	Se	P	C-B	Y	N	N	N	N
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Typhoid/paratyphoid fever Surveillance System	C	Co	P	C-B	N	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Typhoid/paratyphoid fever	O	Co	A	C-B	Y	N	Y	Y	Y

4.45 Variant Creutzfeldt-Jakob disease (vCJD)

vCJD is a fatal form of human spongiform encephalopathy (prion disease), which has been recognised recently (1996, UK) and linked causally to bovine spongiform encephalopathy (BSE). The clinical picture is characterised by progressive neurological deterioration and death, with a mean survival of about 14 months from the onset of symptoms and a mean patients' age at death of 28 years.

The suspected route of transmission is through consumption of infected beef products (although recently human-to-human transmission of vCJD through blood transfusion has been described). The incubation period is unknown. Genetic susceptibility appears to favour the onset of disease. Patients' ages range between 15 and 73 years old. Younger suspected cases have been reported recently, but a definitive diagnosis is possible only at autopsy.

Preventive measures include ensuring that prions do not enter the human or animal food chains and that medical (transfusions) and surgical practices are conducted safely. Prions are very resistant to common disinfection and sterilisation practices.

10-year trends

Animal cases of BSE and human cases of vCJD have been reported from several countries, but the great majority pertains to the United Kingdom, where a massive BSE outbreak occurred in the recent past (peaking in 1993). Since its recognition and as of April 2007, fatal human cases of vCJD worldwide have been 199 (162 in the UK). Three cases (in the UK) have been linked to blood transfusion[1]

vCJD has been detected mainly in United Kingdom but has also been described in six other European countries. The highest reported annual number of cases (30) was in 1999. Since 1999, the number of reported cases declined steadily until 2004, when the reported cases appear to have increased again, but these are still very small numbers.

Table 4.45.1. Number of vCJD cases by year of clinical onset in seven EU countries, 1995–2004

Country*	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
UK	10	11	14	17	29	24	17	14	5	9
France		1				1	1	3		2
Ireland					1					2
Italy							1			
Portugal										1
Spain										1
Netherlands									1	
Total	**10**	**12**	**14**	**17**	**30**	**25**	**19**	**17**	**6**	**15**

Source: EuroCJD. *Country is defined as the country of normal residence at the time of disease onset. One of the French cases and two of the Irish cases had lived in the UK for extended periods in the period 1980–96.

The situation in 2005

In 2005, a total of 14 cases were reported by 23 EU Member States. Six cases were reported by France, five by the UK, two by Ireland and one from the Netherlands. The overall incidence rate remains low at 0.005 per 100 000.

Table 4.45.2 Number of vCJD cases in the EU and EEA/EFTA, 2005

Country	Report type*	Confirmed cases	Incidence /100 000
Austria	C	0	0.00
Belgium	C	0	0.00
Cyprus	C	0	0.00
Czech Republic	C	0	0.00
Denmark	C	0	0.00
Estonia	C	0	0.00
Finland	—	—	—
France	C	6	0.01
Germany	—	—	—
Greece	C	0	0.00
Hungary	C	0	0.00
Ireland**	C	2	0.05
Italy	—	—	—
Latvia	C	0	0.00
Lithuania	—	—	—
Luxembourg	C	0	0.00
Malta	C	0	0.00
Netherlands	C	1	0.01
Poland	C	0	0.00
Portugal	C	0	0.00
Slovakia	C	0	0.20
Slovenia	C	0	0.00
Spain	C	0	0.00
Sweden	C	0	0.00
United Kingdom	C	5	0.01
EU total		**14**	**0.005**
Iceland	C	0	0.00
Liechtenstein	—	—	—
Norway	C	0	0.00
Total		**14**	**0.005**

Source: EuroCJD and country reports. *C: Case-based report; —: No report.

** Note that table 4.45.1 indicates that there were two vCJD cases in Ireland in 2004 (data as reported as EuroCJD, which also included one case in 2005). However, the notification data sent in are different, because these data are based on the date of notification. In the notification data there are no cases in 2004 and two cases in 2005 in Ireland.

Age and gender distribution

Data on age were available only for three cases, with one in each of the groups 5–14, 25–44 and 45–65 year-olds. Of those three cases, two were women and one was a man.

Seasonality

vCJD shows no seasonal trends with cases occurring throughout the year, as might be expected in a disease with incubation periods extending to several years.

EuroCJD data

Countries throughout Europe have been collaborating on studying the characteristics and distribution of CJD since 1993 through an EU-funded project, EuroCJD. The project now involves all Member States and other countries collaborating with this system are Australia, Canada, Norway, Iceland, Israel, Switzerland, Argentina, Japan and the USA. The project is co-ordinated at the National CJD Surveillance Unit in Edinburgh and currently receives funding from DG Sanco and the NeuroPrion Network of Excellence.

The primary objective of the EuroCJD system is to identify novel forms of CJD that might be linked to BSE or other animal prion diseases. The identification of variant CJD in the UK in 1996 and the hypothesis that there may be a causal link with BSE relied on data from this project.

All collaborating countries have established national surveillance systems for CJD in order to identify and investigate all new cases or related disorders. Methods for case classification have been harmonised and risk factors are investigated by a common questionnaire. The information on the incidence of CJD, variant CJD and other subtypes are published on a website[2].

The transmission of BSE to humans in the form of variant CJD through prions in the food chain has had profound political, social and economic implications. Because of the extended incubation period of these disorders, there has been uncertainty about the likely extent of a future outbreak of variant CJD in the UK and other countries. Current data is relatively reassuring as the numbers of deaths from vCJD in the UK have declined over recent years from a peak in 2000. However, uncertainty remains about the possibility of increased numbers of cases over coming years, particularly as there is now evidence of transmission of vCJD through blood transfusion.

Conclusions

- The number of reported cases in the EU has been in decline since 1999, although the overall trend is still stable.
- vCJD is still a very low prevalence disease.
- vCJD is also transmissible via blood transfusion.

References

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2. www.eurocjd.ed.ac.uk.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	CJD register	V	Co	N	C-B	Y	Y	Y	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y

Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide CJD	C	Co	P	C-B	N	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI vCJD	C	Co	P	C-B	N	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Disease-specific surveillance	C	Co	P	C-B	Y	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General non EU case definitions	C	Co	P	C-B	Y	Y	N	N	Y
Italy	Italian National Registry of Creutzfeldt-Jakob disease and related disorders	C	Co	P	C-B	Y	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Liechtenstein										
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y

Portugal	Transmissible Spongiform encephalopathies Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Variant CJD Register	C	Co	P	C-B	N	Y	N	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Transmissible spongiform encephalopathies variant (CJD)	V	Co	A	C-B	Y	N	Y	Y	Y

4.46 Viral haemorrhagic fever

A number of diseases are included under the heading 'viral haemorrhagic fevers' (VHFs), with differences in infectious agent, geographical distribution, incidence, reservoir, transmission modality and clinical presentation. The common denominator is the possible emergence of a haemorrhagic syndrome with lethal consequences. Another common feature is the potential risk that such patients might pose to close contacts and to health and laboratory personnel (raising isolation and lab-security issues) until a firm diagnosis is established. Fortunately the viruses which are transmissible from human to human are generally poorly adapted (with the exception of yellow fever virus and Dengue virus, which in any case require competent vectors). However, in most of these virus infections they remain asymptomatic.

Listed here in bold are those VHFs endemic to the European geographic region. The others may, however, be imported by travellers, and generate a state of high alert in the health services.

1. Rodent-associated VHFs, arenaviruses whose main reservoir is rodents and the main transmission modality is direct/indirect exposure to these rodents:

- Latin-American VHFs (Argentinian, Venezuelan, Brasilian, Bolivian);
- Euro-Asiatic: Hantaan and **Puumala VHF** ('epidemic nephropathy');
- African: Lassa VHF.

2. Arthropod-borne VHF, flaviviruses, except for Crimean-Congo VHF, whose main transmission modality is the arthropod bite:

- Yellow fever (transmitted through mosquitoes): see section 4.49;
- Dengue in its DHF manifestation (transmitted through mosquitoes; **in Europe competent vectors are present**);
- **Crimean-Congo VHF** (a Bunja-virus, transmitted through ticks);
- Kiasnur Forest disease (transmitted through ticks, mainly in India) and Omsk VHF (transmitted through ticks, in Siberia).

3. Monkey-associated African haemorrhagic fevers, these are filoviruses whose reservoir is so far unknown, although monkeys have been implicated, and whose main transmission modality is contact with blood or body fluids of infected monkeys or humans:

- Marburg HF;
- **Ebola HF**.

Recent trends

The quality and availability of data on VHF differs from country to country. Some Member States' annual reports document data on all VHF in general, some on certain specific viral infections, while other countries do not report VHF at all. Norway reported no VHF from 1995–2005; Ireland reported one case of VHF in 1997, and none from 1998–2001; Italy reported one VHF case in the annual report of 2001. Sweden reported one VHF case in 2000, but no further cases between 2001 and 2005. For all these reported VHF cases, no further details are available on the aetiology of these infections.

Dengue fever and Dengue haemorrhagic fever

Imported cases of Dengue fever are rather common, while sporadic cases are usually reported for the other VHFs. In 2002, Germany reported a total of 218 Dengue fever cases, while in the following three years the number remained stable with 135, 121 and 144 cases respectively. For the UK, data are available from the foreign travel-associated illness report (2005), where laboratory reports documented 198 cases in 2001, 242 in 2002 and 259 cases in 2003. The 2004 annual report from Belgium documents 49 cases in 2002, 26 cases in 2003 and 23 cases in 2004. The Swedish annual

report mentions 62 patients diagnosed with Dengue fever in 2005, and 26 patients between 1 July and 31 December 2004.

According to the available data, no cases of Dengue haemorrhagic fever have been reported.

Lassa fever

Individual short papers in *Eurosurveillance Weekly* reported on a total of five imported cases of Lassa fever in Europe in the past five years: two cases in the UK from Sierra Leone (2000 and 2003)[1,2] one case in the Netherlands in 2000, also from Sierra Leone[3]; and two cases in Germany in 2000 from Ghana/Ivory Coast and Nigeria[4,5] For 2005, Austria, Cyprus, Estonia, Germany, Hungary, Ireland, Latvia, Malta, the Netherlands, Slovakia and Spain all returned zero reports for Lassa fever.

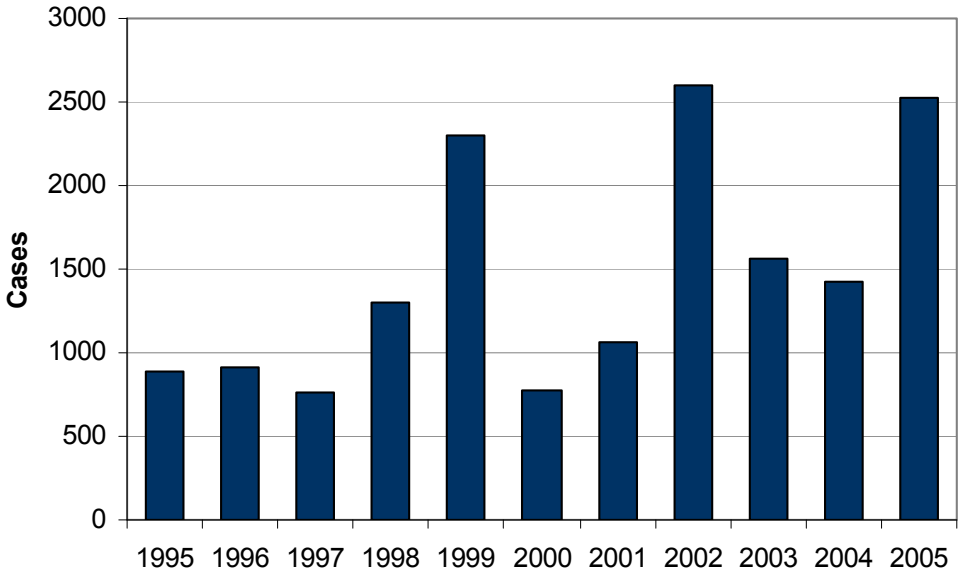
Crimean-Congo haemorrhagic fever (CCHF)

Eurosurveillance Weekly reported one imported case of CCHF in the UK, in a traveller returning from Zimbabwe[6]. No further case reports were found. Zero reports for CCHF in 2005 were received from Cyprus, Estonia, Hungary, Ireland, Latvia, Malta, the Netherlands, Slovakia and Spain.

Puumala haemorrhagic fever with renal syndrome

Puumala virus infections are included in Finland's annual report, and the past 10 years' data illustrate an increase of cases every third year (figure 4.46.1)[7].

Figure 4.46.1. Number of Puumala haemorrhagic fever with renal syndrome cases in Finland, 1995–2005



Ebola and Marburg haemorrhagic fever

No Ebola or Marburg haemorrhagic fever cases have been reported in Europe in the past 10 years. For 2005 specifically, zero reports for Ebola infection were obtained from 18 Member States, Norway and Iceland.

The situation in 2005

Dengue fever and Dengue haemorrhagic fever

In June 2005, large epidemics of Dengue fever were reported from different countries in South-East Asia, including Vietnam, the Philippines and Thailand. In July, a Dengue epidemic was also identified in Singapore, with an incidence of more than 300 cases per week.

Crimean-Congo haemorrhagic fever

In 2005, Promed reported an increase of CCHF cases in Russia compared with 2004, in the Southern Federal District, particularly in the Rostov and Stavropol regions. CCHF is endemic in that area.

Puumala haemorrhagic fever with renal syndrome

In June and July 2005, a strong increase of Puumala virus infections was reported in France, Germany, Belgium, Austria, Luxembourg and Sweden, compared with previous years.

Ebola and Marburg haemorrhagic fever

A small Ebola outbreak was reported in the Republic of the Congo between April and June 2005, with a total of 12 cases, including nine deaths[8].

The largest ever reported outbreak of Marburg haemorrhagic fever occurred in Angola, in the first half of 2005. WHO updates refer to a total of 374 cases, including 329 deaths (case fatality rate 88%)[9].

Conclusion

- The reporting on VHF is irregular within the different EU Member States, with regards to whether VHF is included at all, as well as to the specificity of the reports. More uniform and systematic data collection would allow for better comparison of data between countries.
- Cases of severe VHF infections in Europe are sporadic and usually imported from areas at risk.
- According to the data available, Dengue is the most frequently imported VHF in Europe, but no cases of haemorrhagic fever have been reported. Close monitoring of imported cases is needed, particularly in areas where the vector is established.
- Puumala virus is well established in Europe, and an increase in the number of cases was reported in 2005 in several countries. More systematic data would be needed to illustrate this trend.

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7. http://www3.ktl.fi/stat/.

8. Ebola hemorrhagic fever in the Republic of the Congo – Update 2. Available from: http://www.who.int/csr/don/2005_06_16/en/index.html.

9. Marburg hemorrhagic fever in Angola – Update 25. Available from: http://www.who.int/csr/don/2005_08_24/en/index.html.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Hemorrhagic fevers	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	N

	and 6									
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Hungary	Basic surveillance 2	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Viral haemorrhagic fevers	O	Co	A	C-B	Y	N	Y	Y	Y

4.47 Verocytotoxinogenic Escherichia coli (VTEC)

As a consequence of plasmids and bacteriophages inducing toxin production, some strains of the usually innocuous enteric bacterium *Escherichia coli* become highly pathogenic. Of these, Verocytotoxin (Shiga-toxin) producing strains (variably referred to as VTEC, STEC, EHEC, no consensus on the name has yet been acheived) can cause intestinal and systemic disease.

The main reservoir of such strains is herbivorous animals, cattle in particular. Their meat might become contaminated by faecal matter due to poor processing methods, and their faeces might end up contaminating other foods (e.g. milk, vegetables) and water.

Humans acquire the infection by ingesting such contaminated food or water. Following an incubation period of about 3–4 days, a variety of gastrointestinal symptoms appear, ranging from mild diarrhoea to haemorrhagic colitis, mostly without fever. However, about 8% of patients (children under five years old and the elderly being the most susceptible) may develop haemolytic uremic syndrome (HUS), characterised by acute renal failure, thrombocytopaenia and haemolytic anaemia; neurological involvement is also possible. Antibiotic therapy is not helpful (it might even favour HUS development). The case fatality rate of HUS is about 3–5%.

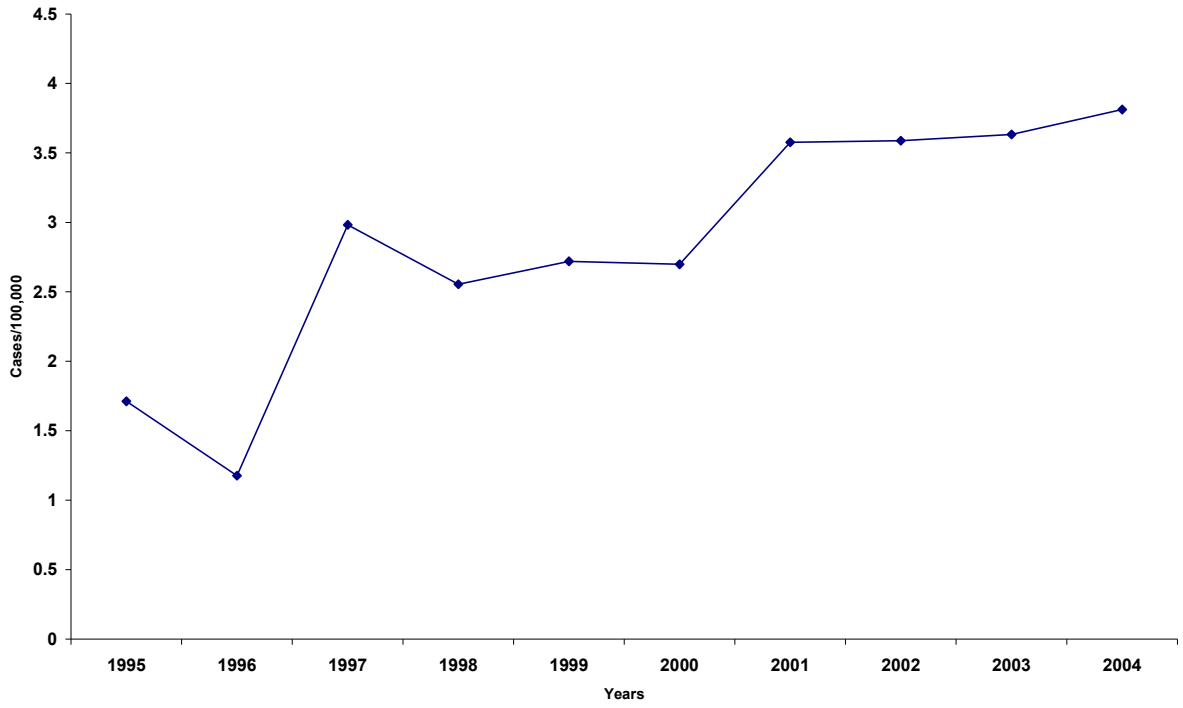
Outbreaks of VTEC have been reported worldwide, in many cases as a result of direct contact with infected animals and swimming outdoors in contaminated surface waters. Controls on farms are important to prevent VTEC introduction into the food chain. Good hygiene practices in meat processing and food handling are essential.

10-year trend

Thirteen countries (11 EU Member States, Iceland and Norway) submitted data for the whole period, while a further nine Member States submitted data for some of the years (VTEC became statutorily notifiable in Germany in 1998). Cyprus, France, Italy, Luxembourg, Portugal and Liechtenstein submitted no data.

In the last 10 years, the incidence has more than doubled, rising from 1995 (1.4 per 100 000) to 2002 (3.2 per 100 000) and levelling off in more recent years. However, this data may, for some countries and for some of the years, include both all *Escherichia coli* and VTEC, while for STEC/VTEC many countries currently focus only on the serogroup O157. However, in the countries focusing on all VTEC serogroups by searching for the *stx* genes or the Stx toxins, the number of findings (and therefore reports) of non-O157 serogroups may exceed those of O157 serogroups.

Figure 4.47.1. Incidence rate of VTEC cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Cyprus, France, Italy, Luxembourg, Portugal and Liechtenstein. For several countries the data may represent a mixture of both *E. coli* and VTEC. In Sweden the reporting system changed in July 2004 so that all serovars became notifiable. Before this date only VTEC 0157 had been notifiable.

The situation in 2005

In 2005, a total of 5 215 cases were reported by 25 countries. Czech Republic (16.72 per 100 000) followed by Sweden (4.27 per 100 000) reported the highest incidence. The overall incidence in the EU was 1.17 per 100 000 (table 4.47.1). Despite a significant decrease compared with 2004, some countries did see an increase, in particular, Austria, Finland, Ireland, the Netherlands, Sweden and United Kingdom. The increase in these countries could be due to improved sensitivity of the surveillance systems, a true increase in the incidence or a combination of both.

Overall, 24 countries sent reports to Enter-net (23 EU Member States and Norway).

Table 4.47.1. Number of VTEC cases in the EU and EEA/EFTA, and VTEC cases reported through Enter-net, 2005

Country	Report type*	Reported cases	Incidence /100 000	Enter-net reported cases	Incidence /100 000
Austria	C	59	0.72	59	0.74
Belgium	C	47	0.45	52	0.50
Cyprus	C	0	0.00	0	0.00
Czech Republic	C	1 709	16.72	—	—
Denmark	C	154	2.85	160	2.91
Estonia	C	19	1.41	19	1.46
Finland	C	21	0.40	21	0.40
France	C	108	0.17	108	0.18
Germany	C	1 162	1.41	1 162	1.4
Greece	—	—	—	0	0.00
Hungary	C	5	0.05	5	0.05
Ireland	C	134	3.26	125	3.19
Italy	C	21	0.04	18	0.03
Latvia	C	0	0.00	0	0.00
Lithuania	C	0	0.00	—	—
Luxembourg	C	8	1.76	11	2.20
Malta	C	5	1.24	5	1.25
Netherlands	C	64	0.39	54	0.34
Poland	C	4	0.01	0	0.00
Portugal	—	—	—	15	0.15
Slovakia	C	61	1.13	61	1.09
Slovenia	C	48	2.40	9	0.45
Spain	C	16	0.04	15	0.04
Sweden([a])	C	385	4.27	364	4.09
United Kingdom	C	1 169	1.95	1 130([b])	2.535
EU total		**5 199**	**1.18**	**3 393**	**0.76**
Iceland	C	1	0.34	—	—
Liechtenstein	—	—	—	—	—
Norway	C	18	0.39	18	0.40
Total		**5 218**	**1.17**	**3 411**	**0.75**

Source: Country reports. Enter-net. *A: Aggregated report; C: Case-based report; 0: No case reported; —: No report.

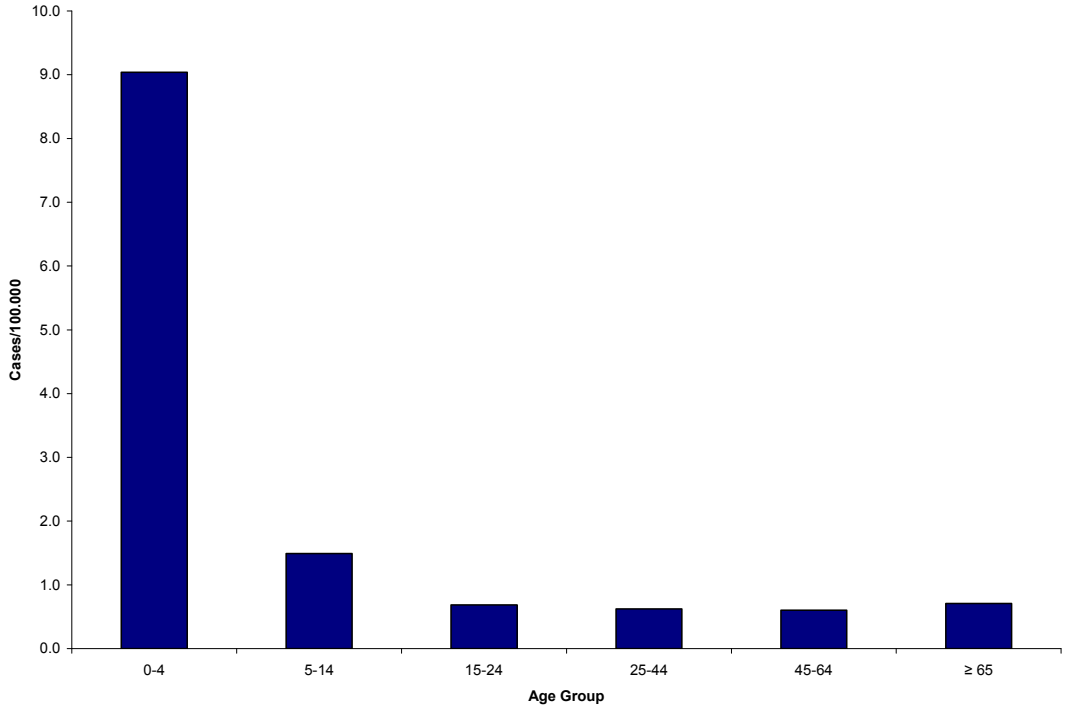
(a) In Sweden the reporting system changed in July 2004 so that all serovars became notifiable. Before this date only VTEC O157 had been notifiable.

(b) Data for England, Scotland and Wales only.

Age and gender distribution

Data on age groups were available from 11 EU Member States, Iceland and Norway. The highest incidence of VTEC was seen in children ≤ 4 years of age (9.04 per 100 000), with the incidence rate falling rapidly with increasing age (figure 4.47.2). The data on gender was available for 2 074 cases, giving no real gender differences between the incidence in females (0.49 per 100 000) or males (0.46 per 100 000).

Figure 4.47.2. Age-specific incidence distribution of VTEC cases for selected European countries, 2005 (n = 2 084)

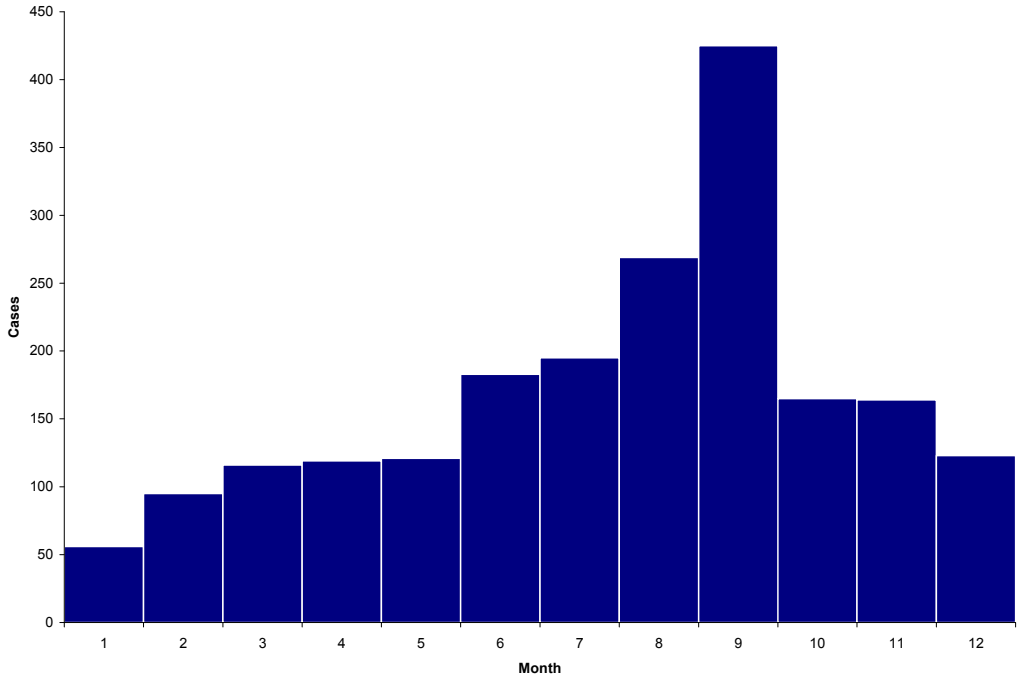


Source: Country reports. Reports with age-specific data were available from: Austria, Denmark, Estonia, Germany, Ireland, Luxembourg, Malta, Netherlands, Slovakia, Spain, Sweden, Iceland and Norway.

Seasonality

Data on seasonality were available from 11 EU Member States, Norway and Iceland. The overall trend shows a clear increase as the weather warms up, reaching a peak of reported cases in September (figure 4.47.3).

Figure 4.47.3. Distribution of VTEC cases by month, for selected European countries, 2005 (n = 2 031)



Source: Country reports. Reports with seasonal data were available from: Austria, Denmark, Estonia, Germany, Ireland, Malta, Netherlands, Poland, Slovakia, Spain, Sweden, Iceland and Norway.

Enter-net data

Twenty-three EU Member States and Norway reported 3 411 VTEC cases to Enter-net.

VTEC serotypes

2 165 cases had additional data on the VTEC serotypes with VTEC serotype 0157 accounting for 80% of cases. Other detected serotypes were 026 (8%), 0103 (6%), 091 (4%), and 0145 (2%).

Antimicrobial resistance

Over 800 strains were tested for antimicrobial resistance (table 4.47.2). Of 888 tested strains, 66% showed resistance to sulphonamides. The majority of tested strains were found to be sensitive to ciprofloxacin and cefotaxime.

Table 4.47.2. Pattern of antibiotic resistance of VTEC strains in 2005

Antibiotic	Sensitive	Intermediate	Resistant	Total
Ampicillin	220	590	82	892
%	25%	66%	9%	100%
Chloramphenicol	851	—	37	888
%	96%	—	4%	100%
Streptomycin	716	26	146	888
%	81%	3%	16%	100%
Sulphonamides	192	113	583	888
%	22%	13%	66%	100%
Tetracyclines	384	396	108	888
%	43%	45%	12%	100%
Trimethoprim (co-trimoxazole)	816	14	57	887
%	92%	2%	6%	100%
Ciprofloxacin	890	—	2	892
%	100%	—	0%	100%
Gentamicin	829	56	6	891
%	93%	6%	1%	100%
Kanamycin	796	63	29	888
%	90%	7%	3%	100%
Nalidixic acid	875	1	12	888
%	99%	0%	1%	100%
Cefotaxime	807	0	0	807
%	100%	0	0	100%

Source: Enter-net.

Monitored threats in 2005

A total of six outbreaks were monitored in 2005. Five were found to have been caused by serotype 0157 and one by serotype 026. Beef was confirmed as the source of one of three 0157 outbreaks and suspected in the case of two. Locally produced contaminated lettuce caused one outbreak in Sweden. One outbreak due to serotype 026 was caused by contaminated camembert cheese. Three of the outbreaks were detected through Enter-net, two from EWRS and one from ProMED.

Conclusions

- The highest reported incidence is in children aged 0–4 years.
- Human VTEC infection shows a seasonal tendency with more cases being reported as the temperature rises, reaching a peak in September.

- The most commonly reported serotype is 0157.
- VTEC strains show resistance to sulphonamides, and needs to be carefully monitored to look out for further emerging resistance.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting EHEC	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	Renashu (HUS surveillance)	V	Se	A	C-B	Y	Y	Y	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Notifiable Diseases System	C	Co	P	C-B	Y	Y	Y	N	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	VTEC E.coli	C	Co	P	C-B	Y	Y	N	N	Y
Italy	ENTERNET	V	Se	P	C-B	Y	N	N	N	N

Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Netherlands	active surveillance Enterohaemorhagic E.coli	C	Co	A	C-B	Y	Y	N	N	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Infection with Enterohaemorhagic E. coli	O	Co	A	C-B	Y	N	Y	Y	Y

4.48 West Nile fever

General description

West Nile virus (WNV), first isolated in 1937 in Uganda, belongs to the *Flaviviridae* family, genus *Flavivirus*. It is an arthropod-borne virus whose reservoir is shared between wild birds and mosquitoes. Humans are mainly infected through mosquito bites, although infection through organ transplantation and blood transfusion has been documented, as has trans-placental transmission.

After the infectious bite, an incubation period of 1–6 days precedes symptoms which tend to vary with the patient's age: from mild fever and malaise in children, a Dengue-like clinical picture in the young (high fever, conjunctival injection, headache, myalgia) to meningo-encephalitis in the elderly and the debilitated. No specific therapy is available.

Since the first large outbreak in Romania in 1996, WNV infection has become recognised as a major cause of public health concern in Europe. No vaccine is currently available. The main preventive measures are aimed at reducing exposure to mosquito bites.

10-year trend

No data is available from Eurostat, while the country reports on WNV infections in Europe are very scanty. However, in the past 10 years, indigenous WNV outbreaks have been documented in Czech Republic (1997)[1] and France (2003) affecting five and seven cases, respectively[2]. In addition, sporadic imported cases have been reported in several European countries (table 4.48.1). The origin of infection of most imported cases is the USA, where an increasing number of autochthonous infections have been described since 1999.

Table 4.48.1. Number of imported WNV infections in Europe, 1995–2005[1]

Reporting country	Year	Number of cases	Country of origin of infection
Czech Republic	2002	1	USA
France	1998	1	Senegal
	2002	1	USA
	2003	4	USA (3), Tunisia (1)
	2005	4	Djibouti
Denmark	2002	2	USA
Netherlands	2003	3	USA
Germany	2003	2	USA
	2004	1	USA
Ireland	2004	2	Portugal

Source: Annual Report 2003. National Institute for Public Health Surveillance, France.

Conclusions

- WNV is known to circulate in Europe, and several outbreaks have occurred. However, developments in WNV transmission cannot be predicted.
- Continuous surveillance is needed in Europe to ensure early identification of cases in humans and animals at risk, to implement protective measures in good time.

References

1. Hubalék Z, Lukáčova L, Halouzka J, et al. (2006) Import of West Nile virus in the Czech Republic. Eur J Epidemiol; 21: 323–4.

2. Annual Report 2003. National Institute for Public Health Surveillance, France.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria										
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark										
Estonia	Obligatory, countrywide, based on a double system of reporting Hemorrhagic fevers	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
France	West Nile virus infection	V	Se	A	C-B	Y	Y	Y	Y	N
Germany										
Greece										
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	West Nile fever	C	Co	P	C-B	Y	Y	N	N	Y
Italy										
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance	C	Co	P	C-B	Y	Y	N	N	Y

	System									
Luxembourg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	virological weekly surveillance report	V	Ot	P	A	Y	N	N	N	N
Norway										
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia										
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK West Nile fever	V	Co	A	C-B	Y	N	Y	Y	Y

4.49 Yellow fever

General description

Yellow fever is due to a virus (YFV) belonging to the *Flavivirus* genus. The disease is endemic in some tropical areas of Africa and the central area of South America, where it has caused large outbreaks in the past.

YFV is an arthropod-borne virus, whose vectors are mosquitoes which also act as an important reservoir, through trans-ovarian transmission of the pathogen. Monkeys and humans also act as reservoirs in the jungle yellow fever and the urban yellow fever cycles, respectively (though both depend on transmission by sylvatic/urban mosquitoes).

Following the insect bite, most infections remain asymptomatic. In clinical cases, after an incubation period of 3–6 days, symptoms appear: first a high fever and conjunctival injection (viremic phase), then, after a quiet spell, a second rise in temperature, accompanied by signs of liver and kidney failure and haemorrhages (primarily intestinal). Up to 50% of icteric cases may be fatal. No etiologic treatment is available.

A highly effective vaccine is available, providing immunity to 95% of vaccinated persons that should be recommended to travellers to endemic areas.

Recent trends

For 2005, zero reports for YFV infection were obtained from 21 countries (19 Member States, Iceland and Norway). No data were available for the other Member States. However, in previous years one case of yellow fever was reported from Germany (1999) imported from Ivory Coast[1], and one case from Belgium (2001), imported from Gambia[2]. Ireland reported one case in 1998 and another in 1999, but no further information is available[3].

Outbreaks in 2005

In October and November 2005, a yellow fever outbreak in the Nuba Mountains, central Sudan was confirmed and by the beginning of December WHO had reported a total of 565 cases, including 143 deaths (case fatality rate 25%). In addition, smaller scale outbreaks were reported from Guinea, Burkina Faso, Senegal, and Mali (table 4.49.1).

Table 4.49.1. Number of yellow fever cases and deaths in high risk countries, 2005

Country	Cases	Deaths	Case fatality rate (%)	Occurrence
Guinea	7	4	57.1	Aug
Burkina Faso	4	1*	25.0	Sep
Senegal	2	2	100.0	Oct
Mali	53	23	43.4	Oct–Nov
Guinea	114	26	22.8	Oct–Dec

Source: WHO Epidemic and pandemic alert and response, 2005. *Case came from Ivory Coast.

Conclusions

- There are no systematic national data from European countries on imported YFV infections available, with most of the information obtained from individual reports in *Eurosurveillance Weekly*, even though this disease is covered by the IHR.
- Yellow fever has not caused any outbreaks in Europe for more than a century. Only sporadic cases occur, imported through travel from endemic regions.
- While the virus currently does not circulate in Europe, there is still a theoretical risk of future endemicity. Surveillance should continue in all Member States, in particular in those areas where the vector is present, and where there is a risk for autochthonous virus transmission.

References

1. Kiehl W. (1999) Suspected case of haemorrhagic fever confirmed as yellow fever in Germany. Available from: http://www.eurosurveillance.org/ew/1999/990812.asp.

2. Colenbunders R. Imported case of confirmed yellow fever detected in Belgium. Available from: http://www.eurosurveillance.org/ew/2001/011122.asp.

3. Annual report 2001. Health Protection Surveillance Centre, Ireland: Available from http://www.ndsc.ie/hpsc/AboutHPSC/AnnualReports/File,519,en.pdf.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Belgium	Mandatory notification in French Community	C	Co	P	C-B	Y	Y	Y	Y	N
Belgium	Mandatory notification in Flanders and Brussel Capital region	C	Co	P	C-B	Y	Y	Y	Y	N
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	MIS	C	Co	P	C-B	N	Y	Y	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Hemorrhagic fevers	C	Co	P	C-B	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece										
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y

Italy	SIMI	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	Osiris	C	Co	P	C-B	Y	Y	N	Y	Y
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal	Yellow fever Surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Statutory diseases	C	Co	P	C-B	N	Y	Y	N	Y
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Yellow fever	O	Co	P	C-B	Y	N	Y	Y	Y

4.50 Yersiniosis (non-pestis)

Besides *Yersinia pestis* (see *plague*, section 4.28) the genus *Yersinia* includes two species frequently causing illness, mainly enteritis, in humans: *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*.

Northern countries are the most affected. Both are zoonoses, with a large number of animals acting as reservoirs, more frequently pigs, whose raw/undercooked meat consumption is often the cause of infection in humans. Direct transmission from other animals (e.g. pets) or through contaminated food or drink is also possible.

After an incubation period of 3–7 days, the clinical presentation includes fever, diarrhoea and abdominal pain in the right lower quadrant, mimicking appendicitis. Untreated (both infections respond well to antibiotics), symptoms last for a long while with significant intestinal damage (ulcerations, adeno-mesenteritis) resulting. Children and adolescents are the most affected. Extra-intestinal manifestations such as arthritis, erythema, nodosum and Reiter's syndrome can also appear.

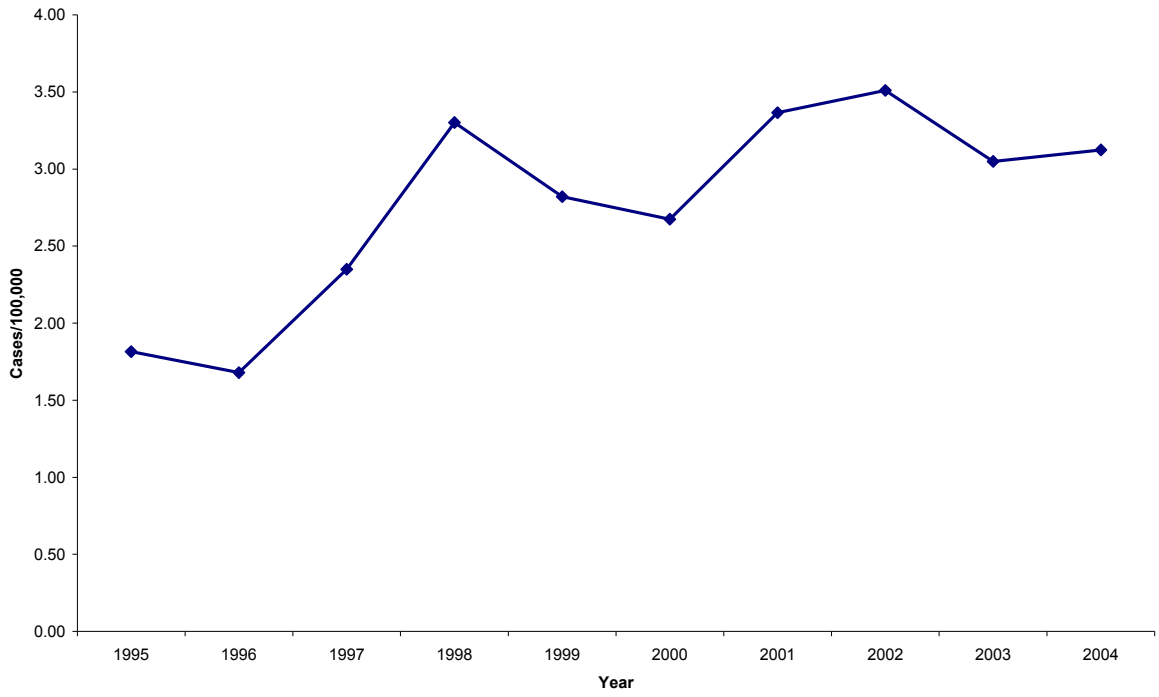
Outbreaks are often detected once a sudden increase in appendectomies is recorded, as a result of mistaken diagnoses of appendicitis. Outside of outbreaks, the differential diagnosis is very difficult. Prophylactic measures include adequate hygiene in meat processing (especially of pork), hand hygiene and protection of water supplies.

10-year trends

Twelve Member States and Norway provided data for the whole period, while a further eight Member States provided data for some years. Cyprus, Italy, Malta, Poland, Portugal, Iceland and Liechtenstein did not provide any data at all.

The incidence rate of reported cases per 100 000 has been relatively stable or rising slightly between 1995 and 2004 but clear peaks in incidence can be seen in 1998 and 2002.

Figure 4.50.1. Incidence rate of yersiniosis cases in EU and EEA/EFTA countries by year reported, 1995–2004



Source: Eurostat. Data missing from Cyprus, Italy, Malta, Poland, Portugal, Iceland and Liechtenstein.

The situation in 2005

In 2005, 23 countries notified a total of 9 662 cases of human yersiniosis with Lithuania (14.63 per 100 000) followed by Finland (12.2 per 100 000) reporting the highest incidence rates. The overall incidence in the EU was 2.23 per 100 000 (table 4.50.1).

Table 4.50.1. Number of yersiniosis cases in the EU and EEA/EFTA, 2005

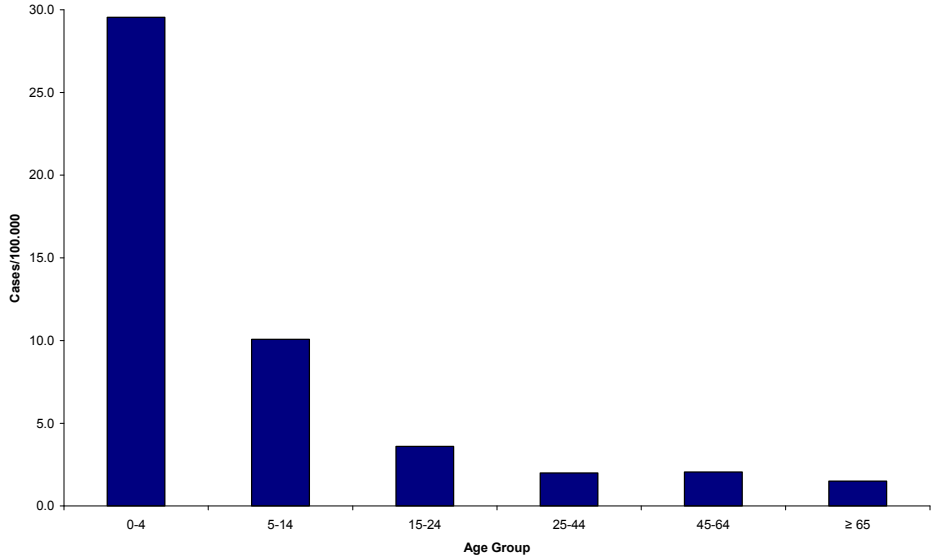
Country	Report type*	Reported cases	Incidence /100 000
Austria	C	98	1.19
Belgium	C	303	2.90
Cyprus	C	0	0.00
Czech Republic	C	498	4.87
Denmark	C	241	4.45
Estonia	A	31	2.30
Finland	C	638	12.18
France	A	171	0.27
Germany	C	5 624	6.82
Greece	—	—	—
Hungary	C	41	0.41
Ireland	C	3	0.07
Italy	C	0	0.00
Latvia	C	51	2.21
Lithuania	C	501	14.63
Luxembourg	C	1	0.22
Malta	C	0	0.00
Netherlands	—	—	—
Poland	C	109	0.29
Portugal	—	—	—
Slovakia	C	63	1.17
Slovenia	C	28	1.40
Spain	C	327	0.76
Sweden	C	742	8.23
United Kingdom	C	65	0.11
EU total		**9 535**	**2.25**
Iceland	—	—	—
Liechtenstein	—	—	—
Norway	C	127	2.76
Total		**9 662**	**2.26**

Source: Country reports. *A: Aggregated report; C: Case-based report; 0: No case reported; —: No report.

Age and gender distribution

Information on age was available on cases from nine Member States and Norway. These data show that the most affected group by far was 0–4 year-olds with an incidence rate of 29.54 per 100 000 in 2005 (figure 4.50.2) followed by the other childhood age group 5–14 year-olds (10.08 per 100 000), but this is probably related more to the likelihood of a diagnosis.

Figure 4.50.2. Age-specific incidence distribution of yersiniosis cases for selected European countries, 2005 (n = 7 459)



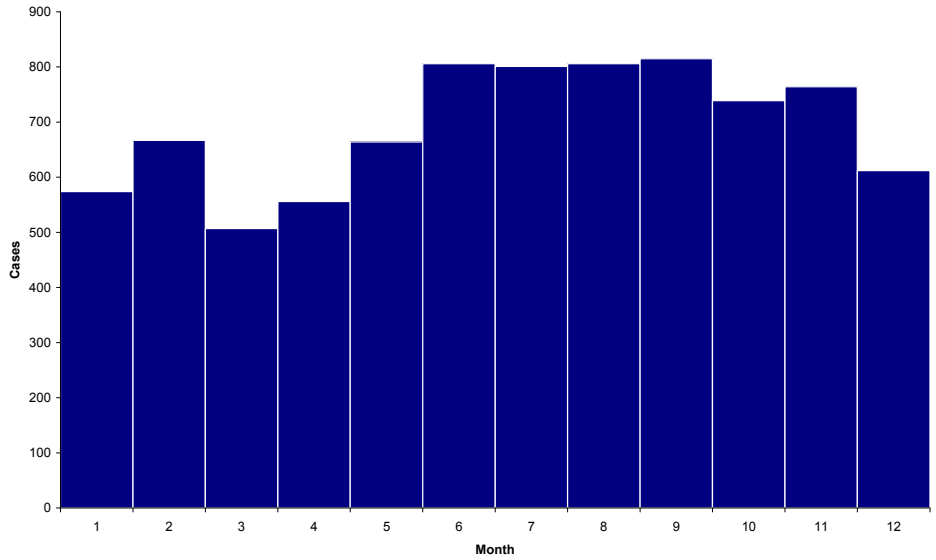
Source: Country reports. Reports with age-specific data were available from: Austria, Estonia, Finland, Germany, Hungary, Ireland, Slovakia, Spain, Sweden and Norway.

Distribution by gender were available for 9 004 cases, but no real differences between men (2.33 per 100 000) and women (1.89 per 100 000) were seen.

Seasonality

Yersiniosis cases show no clear seasonality although higher numbers of cases appear to be reported in the second half of the year, mainly in the summer and early autumn.

Figure 4.50.3. Distribution of yersiniosis cases by month, for selected European countries, 2005 (n = 8 311)



Source: Country reports. Reports with seasonal data were available from: Austria, Denmark, Estonia, Finland, Germany, Hungary, Ireland, Italy, Lithuania, Poland, Portugal, Slovakia, Spain, Sweden and Norway.

Conclusions

- The trend of yersiniosis has been relatively stable between 1995 and 2004, but there were clear peaks in incidence in 1998 and 2002.
- The highest reported incidence is in children less than five years of age.
- Yersiniosis is usually a domestically acquired infection.

Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria	EPIDEMIEGESETZ 1950 plus BGBl. Nr. 114/2006 a	C	Co	P	C-B	Y	Y	Y	Y	Y
Belgium	Laboratory network (sentinel + reference laboratories)	V	Se	A	C-B	Y	N	N	N	Y
Cyprus	System for Mandatory Notified Diseases	C	Co	P	C-B	N	Y	N	N	Y
Czech Republic	EPIDAT	C	Co	A	C-B	N	Y	Y	N	Y
Denmark	Lab based surveillance	C	Co	P	C-B	Y	N	N	N	Y
Estonia	Obligatory, countrywide, based on a double system of reporting Yersiniosis	C	Co	P	A	Y	Y	Y	Y	Y
Finland	National Infectious Disease Register (NIDR)	C	Co	P	C-B	Y	Y	N	N	Y
France	National reference Centres	V	Co	P	C-B	Y	N	N	N	Y
Germany	SurvNet@RKI IfSG 7.1	C	Co	P	C-B	Y	Y	Y	Y	Y
Greece	Laboratory	V	Ot	P	A	Y	N	Y	N	N
Hungary	Basic surveillance 1	C	Co	P	C-B	N	Y	Y	N	Y
Iceland										
Ireland	General and EU case definition	C	Co	P	C-B	Y	Y	N	N	Y
Italy	ENTERNET	V	Se	P	C-B	Y	N	N	N	N

Latvia	Basic surveillance system	C	Co	P	C-B	N	Y	Y	N	Y
Latvia	Laboratory based surveillance system	C	Co	P	C-B	Y	N	N	N	Y
Lithuania	National Communicable diseases surveillance System	C	Co	P	C-B	Y	Y	N	N	Y
Luxembourg	System 1	C	Co	P	C-B	N	Y	N	N	Y
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Norway	MSIS (group A diseases)	C	Co	P	C-B	Y	Y	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia	SURVIVAL	C	Co	P	C-B	Y	Y	N	N	N
Spain	Microbiological Information System	V	Se	P	C-B	Y	N	N	N	N
Sweden	SmiNet	C	Co	P	C-B	Y	Y	Y	N	Y
United Kingdom	UK Yersiniosis	O	Co	P	C-B	Y	N	Y	Y	Y

4.51 Healthcare-associated infections (HCAI)

On the basis of recent national HCAI (also referred to as nosocomial infections) prevalence surveys in Europe, and based on the results of hospital-wide surveillance programmes of nosocomial bacteremia in different EU Member States, the total number of patients acquiring a nosocomial infection in the EU25 every year can be estimated at 3 000 000. Approximately 50 000 deaths are estimated to occur every year as a consequence of the infection. The most frequent infections are urinary tract infections (UTI) (on average 28% in the national prevalence surveys), followed by respiratory tract infections (25%), surgical site infections (17%), bacteraemia (10%), and others (including diarrhoea, with increasing importance due to *Clostridium difficile* ribotype 027). MRSA is isolated in approximately 5% of all nosocomial infections. Other major nosocomial pathogens are MSSA, *Pseudomonas aeruginosa*, *Enterobacteriaceae* (*E. Coli, Enterobacter* sp*, Klebsiella* sp), Enterococci, fungi (*Candida* sp*, Aspergillus* sp), Coagulase-negative staphylococci (e.g. catheter-associated BSI), *Acinetobacter* sp. and *Clostridium difficile*.

Approximately 20–30% of nosocomial infections are considered to be preventable by intensive infection prevention and control programmes including surveillance[1,2]. National or regional surveillance is mostly performed in the context of a surveillance network of hospitals, whereby individual rates are compared to those of other participating hospitals/services as a measure of own performance using risk-adjusted infection rates. Since the latter requires the collection of risk factors and the involvement of clinicians, infection control staff and microbiologists, HCAI surveillance is labour-intensive and therefore targeted on specific high-risk populations (such as intensive care patients) or infection types (surgical site infections, bloodstream infections). Furthermore, several EU Member States still do not have a national surveillance network for HCAI, since setting up such a programme usually involves important political decisions, specific legislation and requires a financial investment at the national and hospital level for setting up or reinforcing infection control programmes, including surveillance.

Improving Patient Safety in Europe[3]

Representatives from national surveillance networks have worked together in the HELICS network (Hospitals in Europe Link for Infection Control through Surveillance) to analyse inter-country differences and work towards comparable surveillance methods. In 2002–03 common protocols were agreed for surveillance of surgical site infections and infections in intensive care units (ICU). HELICS surveillance now continues as part of the DG Sanco project 'Improving Patient Safety in Europe (IPSE)'. The objectives of the other work packages of this project are to assess the feasibility of surveillance of HCAI in European nursing homes and home care, to perform unit-based surveillance of antibiotic consumption and resistance patterns in intensive care units, to promote a common core curriculum for infection control professionals and to provide recommendations on minimum standards for infection control programmes in European countries.

Surveillance of ICU-acquired infections

The HELICS-ICU protocol includes a unit-based (level 1, minimal data set) and a patient-based (level 2) module. In unit-based surveillance, denominator data (patient-days) are collected for the entire unit, in patient-based surveillance, data (including risk factors) are collected for each patient, infected or not. The full protocol is available at http://ipse.univ-lyon1.fr/protocols/icu_protocol.pdf[4].

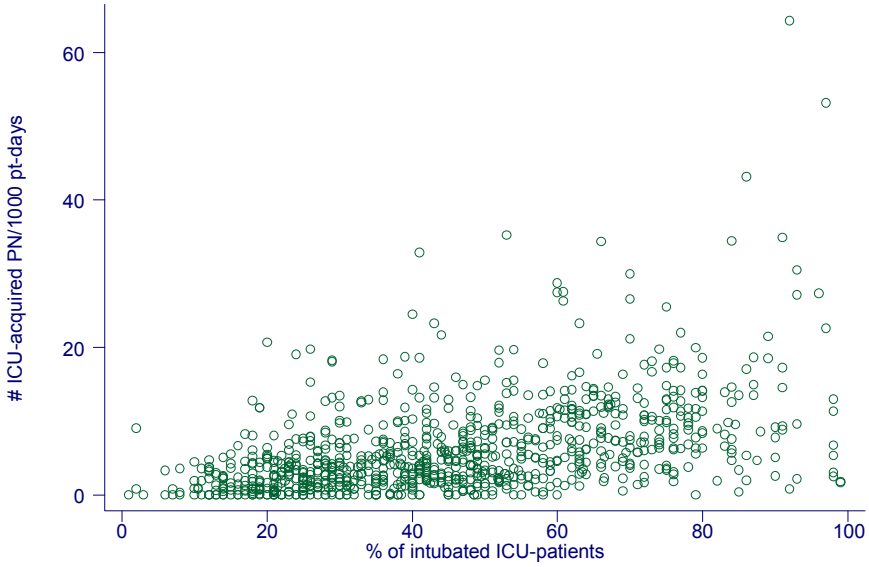
Results of HELICS ICU surveillance, 2004–05

Six patient-based networks (Austria, Belgium, France, Spain, Luxembourg and Lithuania), two piloting countries (Norway and Slovakia) and one unit-based (Germany) surveillance network contributed data on 14 166 episodes of ICU-acquired pneumonia (PN) from 724 ICUs between January 2004 and December 2005.

Of 87 353 patients staying more than two days in ICU, 7.2% (mean of ICU cumulative incidences: 8.7%, median: 7.1%) acquired a pneumonia (intubator-associated: 89.9%). The median incidence density varied from 3.3 PN episodes per 1 000 patient-days (pd) in ICUs where less than 30% of

patients were intubated, to 6.4 per 1 000 pd in ICUs with 30–59% of patients intubated and 9.4 per 1 000 pd in ICUs with ≥ 60% of patients intubated.

Figure 4.51.1. Relationship between the incidence of ICU-acquired pneumonia and the percentage of intubated patients in ICU, HELICS-ICU 2004–05. ***Each dot represents an ICU.***



Source: IPSE.

The most frequently reported micro-organism in ICU-acquired pneumonia was *S. aureus* (19.6%) with an average MRSA/SA percentage resistance of 38.7%. There were marked differences in the relative frequency of isolated micro-organisms between countries (table 4.51.1).

Table 4.51.1. Relative frequency of 10 most frequently isolated micro-organisms in ICU-acquired pneumonia, HELICS-ICU, 2004–05

	Austria	Belgium	Germany	Spain	France	Lithuania	Luxembourg	**Total**
N of ICUs	43	34	329	112	185	12	9	**724**
N of isolates in PN	2 087	1 601	6 074	1 279	4 385	97	133	**15 656**
S. aureus	12.8%	12.1%	21.9%	20.4%	22.4%	17.5%	9.8%	**19.6%**
%MRSA/SA	38.8%	39.1%	34.5%	38.4%	44.8%	NA	NA	**38.5%**
P. aeruginosa	22.2%	18.7%	14.6%	17.7%	23.0%	23.7%	18.8%	**18.8%**
Escherichia coli	6.4%	8.7%	9.9%	6.4%	8.1%	3.1%	8.3%	**8.4%**
Klebsiella sp.	7.7%	7.6%	10.7%	6.4%	5.6%	2.1%	11.3%	**8.2%**
Enterobacter sp.	6.5%	11.7%	7.9%	5.6%	6.7%	1.0%	15.0%	**7.6%**
Candida sp.	12.5%	3.3%	4.8%	2.3%	2.5%	0.0%	7.5%	**4.9%**
Haemophilus sp.	2.4%	5.6%	3.3%	6.4%	5.3%	14.4%	4.5%	**4.3%**
Enterococcus sp.	7.4%	1.7%	5.0%	1.6%	1.0%	1.0%	4.5%	**3.6%**
Streptococcus sp.	3.2%	2.8%	2.2%	3.8%	5.6%	9.3%	1.5%	**3.5%**

Acinetobacter sp.	3.1%	1.1%	2.5%	10.2%	3.1%	14.4%	0.8%	**3.3%**

Source: IPSE.

The diagnosis of PN was confirmed by quantitative culture (HELICS definition PN1 or PN2[4]) in 79% in France, 54% in Spain, 32% in Austria, 21% in Belgium, 15% in Lithuania and 7% in Luxembourg. In the piloting countries (limited numbers), 71% was confirmed in Norway and 0% in Slovakia.

Bloodstream infections (BSI) occurred on average in 3.1% (mean of ICU cumulative incidences 3.3%; median 2.4%) of patients staying more than two days in ICU.

Bloodstream infections were catheter-associated (defined as a primary bloodstream infection with central line use in the 48 hours preceding the infection) in 60%. In 31% of the bloodstream infections the origin was another infection site (pulmonary infection 46%, gastrointestinal tract infection 13%, urinary tract infection 13%, surgical site infection 5%, skin and soft tissue 4%, other/unknown 19%). Nine percent of the BSI were primary BSI without association with central line use.

The most frequently reported micro-organism in ICU-acquired bloodstream infections was coagulase-negative staphylococci (29%) with important variations in the relative frequency between countries, probably again indicating differences in surveillance practices (table 4.51.2).

Table 4.51.2. Relative frequency of 10 most frequently isolated micro-organisms in ICU-acquired bloodstream infections, HELICS-ICU, 2004–05

	Austria	Belgium	Germany	Spain	France	Lithuania	Luxembourg	**Total**
N of ICUs	43	34	329	112	185	12	9	**722**
N of isolates in BSI	590	522	2 045	843	1 453	81	95	**5 629**
Coag.-N staph.	42.4%	22.0%	32.5%	34.0%	17.5%	21.0%	31.6%	**28.7%**
S. aureus	11.2%	7.3%	16.4%	7.9%	19.0%	11.1%	6.3%	**14.2%**
%MRSA/SA	57.4%	36.4%	38.1%	49.3%	53.3%	NA	NA	**46.5%**
Enterococcus sp.	8.8%	7.5%	14.8%	12.8%	7.0%	8.6%	9.5%	**11.0%**
P. aeruginosa	3.7%	10.9%	5.9%	7.4%	10.0%	14.8%	8.4%	**7.6%**
Candida sp.	11.7%	7.1%	4.7%	6.5%	5.5%	3.7%	12.6%	**6.3%**
Escherichia coli	3.4%	7.5%	4.9%	6.5%	8.8%	2.5%	5.3%	**6.2%**
Enterobacter sp.	3.7%	10.7%	5.0%	3.1%	6.0%	6.2%	4.2%	**5.4%**
Klebsiella sp.	3.9%	6.3%	4.9%	4.5%	5.3%	1.2%	10.5%	**5.0%**
Serratia sp.	0.8%	5.2%	2.0%	1.4%	1.7%	8.6%	2.1%	**2.1%**
Acinetobacter sp.	1.4%	1.5%	1.4%	5.1%	1.6%	3.7%	1.1%	**2.0%**

Source: IPSE.

Surveillance of surgical site infections

The approach taken by HELICS to surgical site infections (SSI) surveillance is to enhance the comparability of data by targeting clearly defined groups of procedures and collecting data that enable adjustment for variation in case-mix. Adjustment for case-mix is based on the NNIS risk index[1,2]. This is made up of the 'wound class of contaminated or dirty' for the 'duration of operation of greater than the time at the NNIS 75th percentile time (T time) for that group of procedures'. Each factor is equivalent to one point and each operation is therefore allocated a risk index score of 0–3 depending on how many of the factors are present.

Two indicators have been used to express the risk of SSI: the cumulative incidence, which is the crude percentage of operations resulting in a SSI, and the incidence density, which is the number of SSI per 1 000 post-operative days at risk (i.e. without prior SSI) in the hospital. The incidence density is the preferred measure for the comparison of incidence between countries as it uses only observations during the hospital stay in both numerator and denominator and comparisons are therefore less affected by variation in length of post-operative stay or intensity of case-finding post-discharge. However, the incidence density can only be calculated when the discharge date is known.

Results of HELICS SSI surveillance, 2004–05

SSI surveillance data was received from 15 networks in 12 countries and included 642 hospitals in 2004 and 765 hospitals in 2005. The types and numbers of operations reported by each partner country depended on the scope and capacity of their national surveillance systems (table 4.51.3).

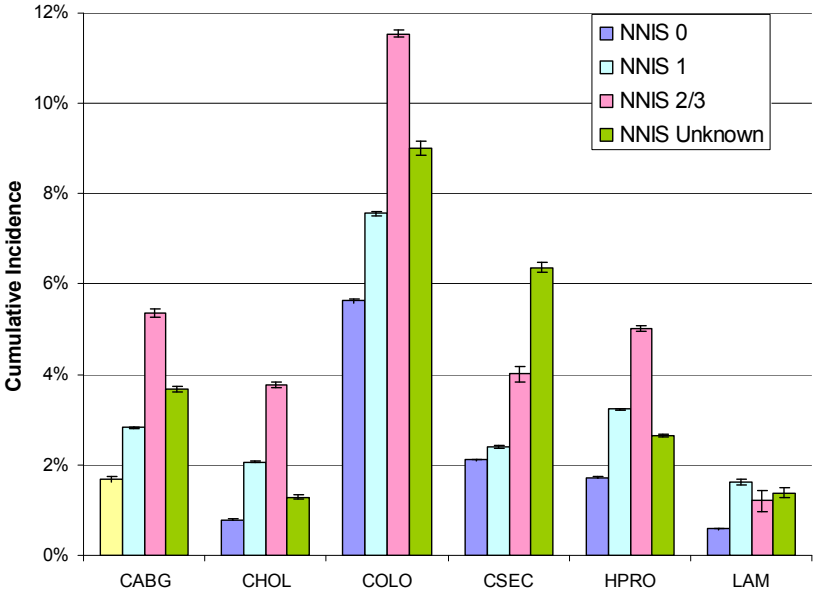
Table 4.51.3. Number of interventions included in the HELICS-SSI surveillance by category and country in 2004 and 2005

	CABG	CHOL	COLO	CSEC	HPRO	KPRO	LAM	**Total**
Austria	439	0	0	933	1 166	284	0	**2 822**
Belgium	169	113	170	95	544	0	185	**1 276**
England	8 515	0	3 134	0	39 684	10 615	0	**61 948**
Finland	0	0	0	0	6 103	0	0	**6 103**
France	880	10 035	6 731	10 699	4 844	3 319	2 755	**39 263**
Germany	10 904	16 445	7 979	20 910	30 478	13 685	3 772	**104 173**
Hungary	0	1 701	476	0	1 203	0	0	**3 380**
Lithuania	1 781	2 528	409	1 418	474	0	0	**6 610**
Netherlands	0	783	964	895	6 081	993	232	**9 948**
Northern Ireland	0	0	0	0	3 941	912	0	**4 853**
Norway	168	167	0	883	1 009	0	0	**2 227**
Poland	787	2 161	776	1 495	1 325	0	222	**6 766**
Scotland	0	0	0	4 957	8 764	3 450	0	**17 171**
Spain	10	90	162	354	379	0	48	**1 043**
Wales	0	0	0	0	2 250	1 413	0	**3 663**
Total	**23 653**	**34 023**	**20 801**	**42 639**	**108 245**	**34 671**	**7 214**	**271 246**

Source: IPSE. CABG: Coronary artery bypass graft; CHOL: Cholecystectomy; COLO: Colon surgery; CSEC: Caesarean section; HPRO: Hip prosthesis; KPRO: Knee prosthesis; LAM: Laminectomy.

The percentage of surgical site infections (cumulative incidence, see figure 4.51.2) varies strongly according to the type of surgical intervention category and according to the NNIS risk index.

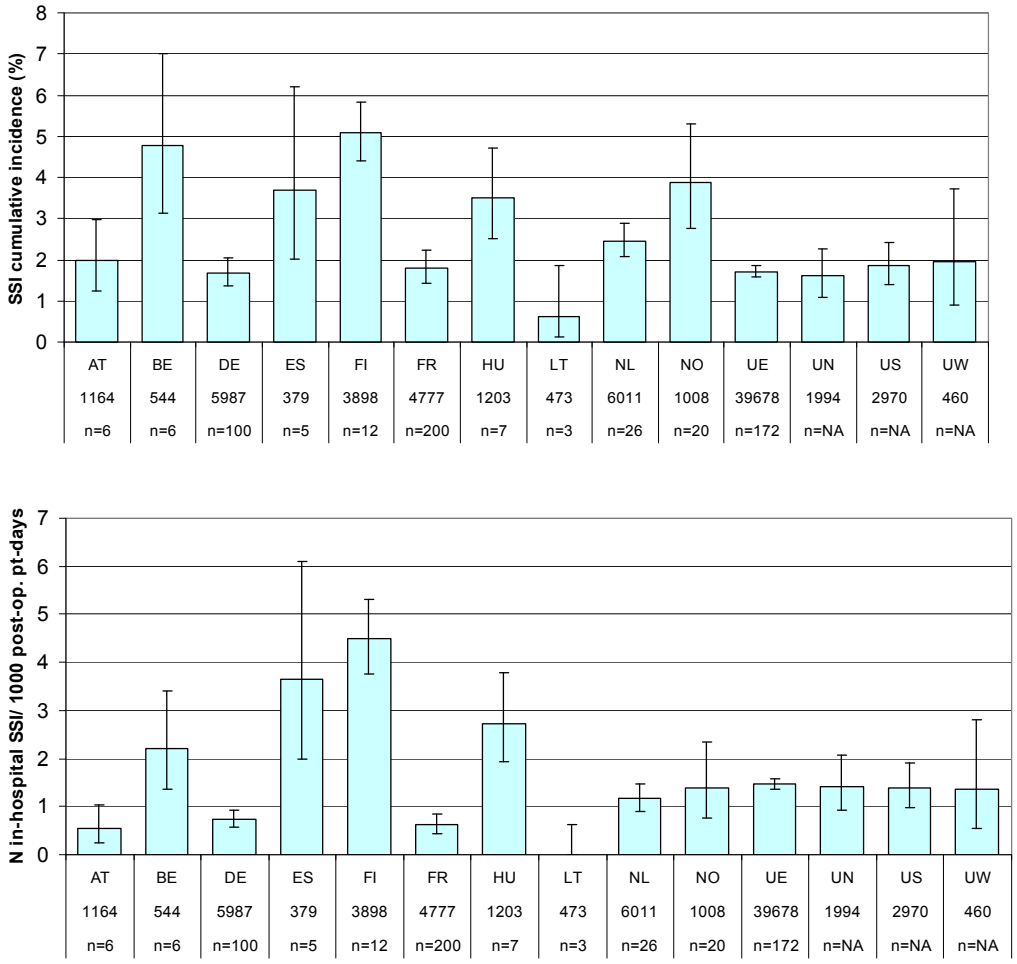
Figure 4.51.2. Cumulative incidence of surgical site infections by intervention category and NNIS risk index



Source: IPSE.

The most frequently included type of intervention in the national surveillance systems is hip prothesis (HPRO). The case definition of SSI for HPRO includes infections occurring up to 12 months after the intervention. However, the intensity of post-discharge surveillance (PDS) varied markedly between countries with some countries, e.g. England, undertaking no PDS. These factors have a major impact on the validity of inter-country comparisons based on cumulative incidence of SSI. Therefore, in-patient incidence densities are preferred for such comparisons as they take some account of variation in follow-up period. Figure 4.51.3 demonstrates that when countries are ordered by rate of SSI their relative position varies according to whether the cumulative incidence or incidence density is used. This figure also illustrates the importance of taking into account the precision of the estimated rate. Indeed, since participation in the national surveillance is voluntary in most countries, the number of participating hospitals may be small.

Figure 4.51.3. Comparison between cumulative incidence and incidence density of SSI for hip prosthesis by country. ***Bars represent 95% confidence limits. Numbers represent the number of interventions and the number of hospitals***



Source: IPSE. AT: Austria; BE: Belgium; DE: Germany; ES: Spain; FI: Finland; FR: France; HU: Hungary; LT: Lithuania; NL: the Netherlands; NO: Norway; UE: England; UN: Northern Ireland; US: Scotland; UW: Wales.

Conclusions

- HCAI are an important cause of morbidity and mortality.
- The surveillance of HCAI needs to be expanded to ensure that a clearer overview of the situation and trends is obtained for planning more targeted interventions.

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Surveillance systems overview

Country	System	Compulsory/ Voluntary	Comprehensive/ Sentinel	Active/Passive	Case-based/ Aggregated	Data reported by				National Coverage
						Labs	Physicians	Hospitals	Others	
Austria										
Belgium	National Surveillance of Hospital Infections (NSIH): Noso	V	Se	A	C-B	Y	Y	Y	N	Y
Cyprus										
Czech Republic	Register of nosocomial infections 1	V	Se	P	C-B	Y	Y	Y	N	N
Czech Republic	Register of nosocomial infections 2	V	Se	P	C-B	Y	Y	Y	N	N
Denmark										
Estonia										
Finland	Finnish Hospital Infection Program (SIRO)	V	Se	A	C-B	N	N	Y	N	N
France	Mandatory notification of infectious diseases	C	Co	P	C-B	Y	Y	Y	Y	Y
France	RAISIN: National network of alert, surveillance and investigation of nosocomial infection	V	Se	A	C-B	Y	Y	Y	N	Y
Germany										
Greece										
Hungary	Hungarian National Nosocomial Surveillance System	V	Co	A	C-B	N	N	Y	N	N
Hungary	Hungarian National Nosocomial	V	Co	A	A	N	N	Y	N	N

	Surveillance System									
Hungary	Hungarian National Nosocomial Surveillance System	C	Co	A	C-B	N	N	Y	N	Y
Hungary	Hungarian National Nosocomial Surveillance System	C	Co	A	C-B	N	N	Y	N	Y
Iceland	Mandatory surveillance of diseases subject to registration in Iceland	C	Co	P	C-B	Y	Y	N	N	Y
Ireland										
Italy										
Latvia										
Liechtenstein										
Lithuania	National Nosocomial Infection Surveillance System	V	Co	A	C-B	N	N	Y	N	Y
Luxembourg										
Malta	Disease Surveillance Unit	C	Co	A	C-B	Y	Y	Y	Y	Y
Netherlands	ISIS-laboratory surveillance system	V	Ot	P	C-B	Y	N	N	N	N
Netherlands	PREZIES	V	Se	A	C-B	N	N	Y	N	N
Norway	NOIS	C	Co	A	C-B	N	N	Y	N	Y
Poland	National Surveillance System of Infectious Diseases	C	Co	P	C-B	Y	Y	N	N	Y
Portugal										
Slovakia	EPIS - Epidemiological Information system	C	Co	A	C-B	Y	Y	Y	Y	Y
Slovenia										
Spain										
Sweden										
United Kingdom	UK Nosocomial infections	V	Co	A	C-B	Y	Y	Y	Y	Y

5 Overall patterns of communicable diseases in Europe

5.1 Patterns and trends in selected risk groups and areas

This chapter will summarise the main patterns and trends of the main diseases, again conveniently subdivided into disease groups, with an emphasis on the common determinants or populations at risk. Due to the major differences between the present national surveillance systems, the figures are not truly comparable between the countries. Low numbers could be due to either few infections or a high degree of under-reporting, or conversely high numbers could be due to either many infections or simply a highly effective surveillance system. In addition, the quality of the data is known to vary between countries, and one of the main tasks for ECDC is to improve the quality and validity of the surveillance system data, which should be evident in future reports. Yet despite these reservations, certain trends appear evident, as described below.

Influenza

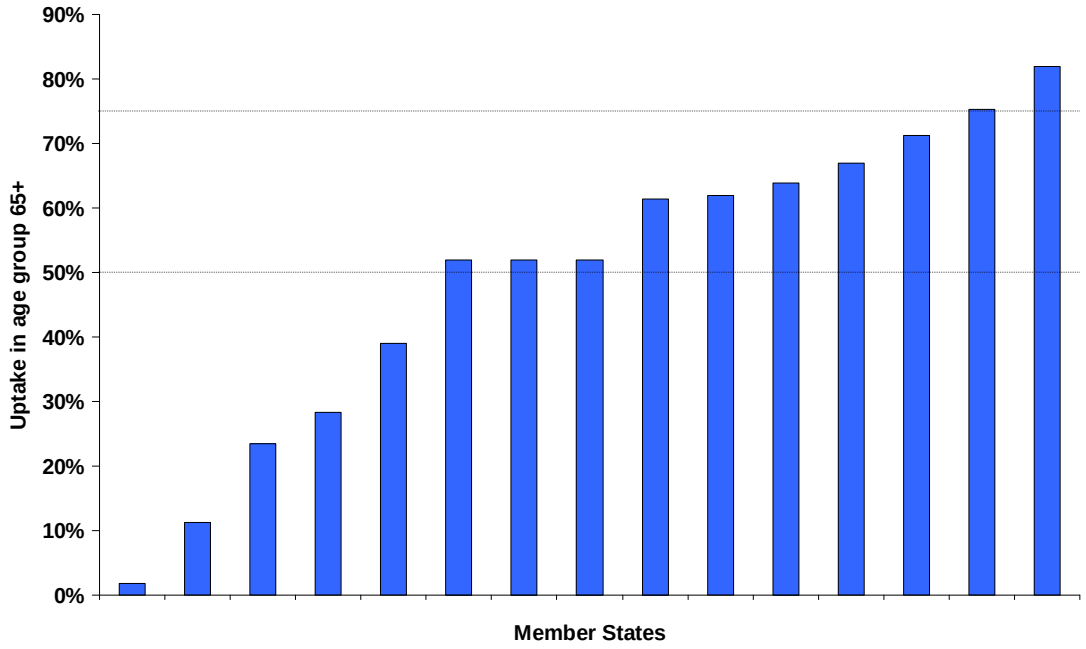
Influenza has three major priorities: further pandemic preparedness planning, the need to increase coverage with the 'normal', seasonal vaccine, and thirdly dealing with the threat of avian influenza, and its potential for starting a pandemic.

Human seasonal influenza

Significant numbers of people develop influenza illness each year in the EU. Some of these develop severe symptoms and a few even die prematurely as a result (particularly those at higher risk of secondary respiratory infection).

Most EU Member States follow WHO guidance that recommends vaccination against human seasonal influenza be offered annually in the early autumn for three major risk groups (the elderly, healthcare workers and those with chronic medical conditions of all ages, such as diabetes or heart disease). Despite a WHO target being accepted by all European countries[1], the vaccine is currently underused in the EU. Some countries cannot routinely monitor their uptake even among the elderly, and for those that can, they are seemingly not achieving the WHO target for that group (see figure 9.1.1).

Figure 5.1.1. Estimated elderly population immunised against Influenza (%); n = 15 EU MS



Source: ECDC AF Survey, April 2006. Population (2003): Eurostat[2].

There is considerable potential for health gain in Europe. Not only by improving vaccination coverage in these selected groups, but also by taking other measures to minimise virus transmission. In this sense, better application of ECDC's recommended personal protection measures (regular hand-

washing, good respiratory hygiene, mask-wearing in healthcare settings during acute febrile period, early isolation of symptomatic personnel, etc), would reduce the risk for all people[3].

Preparing for pandemic influenza

At irregular intervals new influenza A subtypes emerge and some go on to an influenza pandemic. Since 2005 there has been an extraordinarily concerted effort by all EU countries to strengthen their readiness for such a pandemic, that many feel is quite imminent. However, much remains to be done and it is estimated that another two to three years of intense work is required by all Member States as well as EU institutions[4]. Key areas where further work is especially needed are:

- integrated planning across governments;
- making plans operational at the local level;
- interoperability at the national level;
- stepping up prevention efforts against seasonal influenza;
- extending influenza research.

Apart from these it is important that the standard WHO and EU guidance continues to be followed[5,6] There are many examples of innovative approaches taken by EU countries which include:

- using churches to communicate preparedness messages on avian influenza to poorer communities;
- formal published inspections of regional and local plans and preparedness by a national inspection service;
- nominating pandemic preparedness representatives in minority populations in order to bridge potential language and cultural barriers;
- computerised hospital systems that can readily give age-specific mortality data in 'real time';
- a national web-based database that can capture case-specific data from the first few hundred cases of a pandemic strain;
- bilateral 'interoperability' workshops between Member States, drawing in bordering regions of neighbouring countries.

Avian influenza (bird flu due to the A/H5N1 viruses)

Avian influenza is now known to follow a seasonal pattern and therefore we can expect to see more of this disease in the coming years. There have not yet been any human H5N1 cases in Europe and this is a minor human health issue as long as the A/H5N1 virus stays in its current form. The risk of infection is almost entirely confined to people who own domestic poultry and so could have close and intense contact with sick birds or their droppings. They can protect themselves by applying the measures recommended by ECDC[6]. People travelling to countries where A/H5N1 is prevalent can sometimes enter this category if they are staying with families with domestic poultry[7].

Tuberculosis

The overall trend of this disease in the EU shows a clear decrease during the last decades, thanks to the sustained efforts of public health authorities. However, a more precise and disaggregated analysis is necessary to identify certain groups of populations and regions or countries where current and future public health actions should be focused. Continued vigilance, monitoring, case detection and treatment are needed to continue the downward trends and to ensure that the EU countries can move towards elimination.

The number of TB cases in the EU and the average rate per 100 000 is among the lowest in the world together with the USA, Australia and some other countries (below 20 per 100 000). In 2005, 25 EU countries plus Iceland and Norway reported 59 497 TB cases, corresponding to an overall rate of 12.8 per 100 000 population. Twenty-two countries in the EU had rates below 20 cases per 100 000 population and 14 of those below 10 per 100 000, some of them in the drive towards elimination of the disease. The Baltic States and countries joining the EU in 2007 concentrate the highest burden of disease. Otherwise TB rates are declining in most EU countries. Between 2001 and 2005 notification rates decreased by 2.5% yearly, probably reflecting an overall decline in previously untreated cases. Increases have, however, been seen in Greece (due to improved detection of cases), Sweden and the UK (mostly in foreign-born cases)[8]. In most Member States, it is now mostly a disease of old people, being re-activated after a primary infection many decades ago, and of specific disadvantaged groups

of society (such as prisoners, the poor in inner cities, the homeless, drug users, persons living with HIV, the elderly, and immigrants of foreign origin).

Recent demographic, political and socioeconomic changes in Europe, like growing migration movements and the changes that followed the collapse of the former Soviet Union leading to a poorer control of the disease, have been major determinants of the tuberculosis situation in Europe. Trends have continuously decreased, at least in the western countries, but the general pattern has changed.

The last decades' patterns of urbanisation and the combination of internal (rural to urban) and external migration have determined the existence of impoverished areas on the outskirts of the biggest European cities, which provide favourable social and economic conditions for the spread of tuberculosis. Cases of foreign origin are an increasing proportion of tuberculosis cases in many EU countries. They accounted for 20% of all reported cases in 2005 (country range: 0–82%). Most cases of foreign origin were from Africa, Asia or from another country within the European Region.

Different patterns with respect to TB are observed across the EU:

1. Industrialised countries with westernised economies corresponding to the EU15 Member States where TB rates are low and disease increasingly aggregates in sub-populations and settings associated with poverty and lowered immunity. Prevalence of HIV and drug-resistance among TB cases is low to moderate.

2. Countries that joined the EU in 2004 which show a rate five times higher than the EU15 Member States. Among those the countries in central Europe show moderate TB rates. Cases of foreign origin are rare, and the levels of HIV and drug resistance are low.

3. In contrast, the Baltic States are characterised by high TB rates, a low proportion of cases of foreign origin but high frequency of drug resistance and HIV steadily increasing among TB patients. Multi-drug resistance is complicating treatments in the Baltic States: resistance to both isoniazid and rifampicin (multi-drug resistance) was detected in 18% of all cases tested in 2005 in the Baltic States (other countries ranged between 0–6%). Most of the XDR cases reported were in the Baltic States.

4. Bulgaria and Romania which joined the EU in January 2007. This by itself will increase cases in the EU by over one half.

Our attention should be directed not only to the EU countries, but also in the neighbouring countries. The current border with the former Soviet Union will enlarge further and migration from the neighbouring countries where TB rates are higher and MDR is an issue may be expected to increase. Also, immigrants to the EU from high-prevalence countries retain their risk of developing TB even after moving to Europe. Even if tuberculosis is slowly declining in the EU right now, there are areas with high levels of drug-resistant tuberculosis, mostly due to incomplete or ill-designed treatment regimes.

Supporting the development of the health systems in those countries and a call for intervention on some socioeconomic determinants of CD and outbreaks can contribute to the reduction of some risks related to CD importation. In that sense we should be aware of the consequences of complex social, political and economic changes on the European Union's new eastern border, especially Russia, Ukraine and Belarus, as societies in political transition with socio-economic and cultural determinants that facilitate the transmission of infections, like HIV and tuberculosis[9].

Food- and waterborne diseases

The effective surveillance of this group of diseases is further challenged not just by variations in reporting systems but also by the different degrees of coordination with food, animal and environmental control authorities. Effective prevention and control requires not only a close collaboration between microbiologists and epidemiologists in public health, but also close collaboration with veterinary and food safety authorities. On the EU level, besides ECDC, the Commission, EFSA and WHO Euro are important players.

Mass catering, intensified farming, industrial food production, and a largely international food market has created new, wide-ranging pathways for infectious disease agents to spread. The intriguing 'sophistication' that food infections may take was revealed by the surprising finding in the famous 'mad cow' (BSE) epidemic some years ago, i.e. that prions (infectious agents smaller than viruses) could spread through the food chain from cattle to cattle and to humans, creating devastating brain infections in both animals and man.

Changes in consumer behaviour (and, subsequently, in the production and distribution of foods) have led to a situation whereby one contaminated part of food can affect a large number of individuals, often in geographically distant areas. Untreated, raw foods are considered healthier than treated ones (e.g. raw versus pasteurised milk) and more meals are consumed outside the home resulting in higher

number of persons exposed to mass-catering and with less knowledge of food hygiene in the preparation of food at home.

Modern food production technology and the globalisation of trade means that raw products from one country can be processed in another, shipped abroad and stored frozen for long time before being sold and consumed. This can result in large multinational food-borne outbreaks and much more difficult situations for prevention and control, i.e. the detection of a multinational outbreak demands more advanced methods of data collection and analysis, including data from humans, animals and food, and also an enhanced rapid information exchange. Other risks are new animal husbandry practices, deforestation, increasing demand for animals for food, etc.

The impact of diseases on food trade, animal husbandry and tourism emphasises the need for high quality surveillance and a good collaboration between the corresponding authorities. Some of these diseases have received increased attention because of their potential for use as a bioterrorism threat (i.e. anthrax, botulism).

Over the past 5–10 years, an increasing number of multinational food-borne outbreaks have been observed which can be detected only by optimal communication and/or pooling of data on an international level. Particularly for these diseases, the integration of laboratory sub-typing data is pivotal for the rapid recognition of clusters. Since many of these diseases have short incubation periods, short reporting intervals are required in order that data are available early enough for effective action to be taken. Measures have to be implemented at a local level and therefore the results of any cluster analysis have to be communicated very rapidly to those who need to take the action.

The current list of food-borne diseases for surveillance at EU level does not reflect the increasing importance of food-borne viruses. Extensive norovirus outbreaks in cruise ships, hospitals, and other public settings (although not all of them due to contaminated foodstuffs) have been an important cause of public alarm, increasing epidemiological surveillance units' workload and costs for the tourist industry. The list of diseases under surveillance needs to be reviewed with regard to food-borne viruses, and rapid information exchange platforms established for all food-borne diseases. Regarding another viral infection, Hepatitis A, sexual transmission among men who have sex with men (MSM) has recently been described, compounding the prevention and control programmes for this disease.

The incidence of campylobacteriosis has remained high since 2002 and it is still the most commonly reported intestinal infection in the EU that shows an increasing trend. For (non-typhoidal) salmonellosis, the overall decreasing trend in the last 10 years in the EU continued in 2005 in most of the MS. Although the majority of symptomatic *Campylobacter* and *Salmonella* infections don't require any drug treatment, invasive infections do occur. Hence the monitoring of antibiotic resistance is important and should be included in the surveillance.

Listeriosis cases showed an increasing trend from 1998 through to 2004, with a further increase in 2005 and definitely warrant more attention at EU level. For STEC/VTEC, many countries currently focus on the serogroup 0157. Trichinellosis cases are relatively rare in the EU but outbreaks still occur, and most of these are domestically acquired. Data on parasitic food-borne diseases are available only for few countries. For these diseases, information on importation status would be important.

A large fraction of cryptosporidiosis cases in Europe, both sporadic and epidemic cases, are believed to be waterborne. The proportion of waterborne infections compared to food-borne infections probably differs substantially between countries with regards to recreational water activity and the quality of the public water supply. A major pathway of giardiasis transmission is faecal-oral route in poor sanitation conditions or exposure to contaminated water or food. In the EU, inmates in nursing homes or children in daycare centres are particularly susceptible to giardiasis outbreaks.

The transmission of vCJD through prions in the food chain has had profound political, social and economic implications. Thanks to extensive preventive measures to ensure that the BSE prions do not enter the human or animal food chains, and that blood or tissue for transplants from potentially infected persons are not used in medical care, the current data are relatively reassuring, as the number of deaths from vCJD in the UK has declined over recent years from a peak in 2000. However, uncertainty remains about the possibility of increased numbers of cases over the coming years, particularly as there is now evidence of transmission of vCJD through blood transfusion.

Other diseases of environmental and zoonotic origin

This is a very heterogeneous group of diseases comprising:

- Zoonoses endemic in the EU (e.g. anthrax, echinococcosis, leptospirosis, Q fever, rabies, toxoplasmosis, tularaemia). Some of these diseases could potentially be used as a bioterrorism threat (anthrax and tularemia).
- Endemic diseases of environmental origin (e.g. legionellosis).
- Mostly imported diseases of environmental and zoonotic origin (cholera, malaria, plague, viral haemorrhagic fevers, WNV infection).

That Europe, with the increasing criss-crossing of European tourists and businessmen to all corners of the globe, as well as the increasing immigration to the continent, is faced with an increasing risk of importation of dangerous CDs from tropical countries, is a well recognised fact.

The increased tourism and business travel, likely to rise further in the years ahead, means greater vulnerability to the spread of old, re-emerging and new diseases. Of particular concern is the 'adventure/eco' tourism to remote areas all over the world, being travels that bring a steadily growing number of humans into contact with pathogens and reservoirs. Another effect of this increased travelling is 'airport malaria' that is sometimes reported in relation to the inadvertent transport of infected mosquitoes from endemic areas.

Further, the growing cooperation of Europe with low-income countries results in a regular flow of European professionals from different fields (health care, engineering, planning, etc), enrolled in NGOs and national cooperation agencies. They are also exposed to (re-)emerging diseases and can be an involuntary vehicle for the entrance of these diseases in Europe.

Environmental, ecological and climate changes contribute to the emergence, maintenance and transmission of vector-borne and other infectious diseases, some of them imported from regions where they are endemic. The effect of global warming on Europe in the years ahead could increase this danger. In particular, the potential for malaria re-introduction in countries where it has been eradicated is a growing concern also due to global climate change, as the malaria vectors are still present in those areas, including Europe.

The period 1995–2003 shows a recent, but clear tendency to a reduction in imported malaria cases in all those countries which had been showing the highest incidence rates. There, cases peaked around the year 2000 and kept decreasing thereafter. As far as measures to prevent importation of infected anophelines in Europe are concerned, they seem to be sufficient and effective. 'Airport-malaria' cases have been quite rare. In all of these diseases, counselling international travellers is an effective tool to avoid imported cases.

Cases of severe VHF infections in Europe are sporadic and imported from areas at risk. The situation is different for Dengue and Puumala virus infection. Dengue fever is the most frequently imported disease with haemorrhagic potential in Europe, but no cases of haemorrhagic fever have been reported. Puumala virus is well established in Europe, and an increase in the number of cases was reported in 2005 in several countries.

In Europe no plague cases have been reported for a long time. Nonetheless, though relatively rare, the disease has a world-wide distribution and, in recent years, a growing number of cases is being reported to WHO.

The popular use of cooling towers in European cities and the parallel development of mass tourism have resulted in several large outbreaks of legionnaires' disease. Legionellosis cases have increased steadily between 1996 and 2002 and remained stable since then. Legionellosis affects more elderly and men, maybe due to exposures related to travelling. A closer control of cooling towers risk could be reached through specific programmes, which include hygiene standards regulations, cooling tower registry, regular inspections and law enforcement, including the closure of high-risk towers if necessary. Exchanging information between public health authorities from the tourist's place of origin and destination countries and with the tourism industry is a milestone for enhancing current surveillance efficiency.

The incidence of leptospirosis has decreased in 2003 and 2004 and cases are probably related to occupational risks and exposure during the practice of water sports. The female majority amongst reported cases of toxoplasmosis reflects enhanced screening among pregnant women. Therefore, and due to large differences in reporting systems (e.g. reporting only clinical, congenital or both types of toxoplasmosis), trend analysis is difficult and a comparison across countries can not be done.

The risk of a reintroduction of rabies into the EU is limited to travelling and cross-border movements of rabid animals.

The real number of echinococcosis cases is probably much bigger than reported, especially if we consider the slow progression of the disease that for years can be asymptomatic. The lack of constant Q-fever reporting makes it difficult to assess the past and future trend. It is also a disease typically reported under confirmation due to its unspecific clinical features and the need for laboratory tests to diagnose it. Between 1995 and 2004 the reported number of tularaemia cases in the EU has been very unsteady, but with a slightly decreasing trend. The exceptions to that are Finland and Sweden which remain among the most affected countries. Most of the cases are related to certain occupations and activities in the open air, in close contact with natural reservoirs, including wild rabbits, hares, muskrats as well as some domestic animals.

Many of the diseases mentioned above are typically reported under confirmation due to their specific clinical features, their severity and the need for laboratory tests or surgical procedures (e.g. echinococcosis) to make a diagnosis. Although clear difficulties for a proper epidemiological analysis exist, there appears to be an overall decreasing trend of incidence in Europe, related to improved veterinarian control of cattle and domestic animals and a narrower contact of the population with reservoirs (especially cattle) and vectors, due to the urbanisation process.

This is a wide range of diseases with different modes of transmission and with different relevance to European public health. More systematic surveillance data are needed in order to allow for a more coordinated approach in terms of prevention and control. Imported cases through travel need to be monitored, in particular for those with the potential for autochthonous transmission (malaria, chikungunya, yellow fever, etc), high infectivity (most VHF), etc. Considering the types of diseases and their possible impact, we need to be able to ensure rapid diagnoses for each of them, as well as for unknown pathogens. The resurgence of SARS leading to an outbreak remains a distinct possibility, and in the inter-epidemic period, all countries must remain vigilant for the recurrence of SARS and maintain their capacity to detect and respond to the re-emergence of SARS should it occur.

Vaccine-preventable diseases (VPD)

Europe's VPD epidemiological trends, generally decreasing, have been determined by four main factors: the introduction of new vaccines (e.g. hepatitis B and bacterial meningitis); new dose-schedules in immunisation calendars (e.g. measles second dose); the effectiveness of the vaccines in use (e.g. mumps vaccine); and a decrease in vaccine coverage (e.g. diphtheria and MMR) in some countries.

The epidemiological situation in the studied period can be summarised, grouping VPD into four categories:

Group 1: Vaccination policies in place in all countries, diseases under control: tetanus, diphtheria, polio.

Group 2: Vaccination policies in place in all countries, diseases not under control: pertussis, measles, rubella, mumps.

Group 3: Vaccination policies not in place in all countries, diseases not under control: Hepatitis B, bacterial meningitis (*H. Influenzae* type b, meningococcal disease, pneumococcal disease).

Group 4: 'New' vaccines: varicella, rotavirus, HPV.

WHO targets for polio eradication and measles and congenital rubella infection elimination were important references and milestones for public health policies in this field. The last case of flaccid paralysis caused by wild polio in Europe was reported from Turkey in November 1998 and in June 2002, the WHO European region was declared polio free. However, poliovirus imported from poliomyelitis-endemic countries remains a threat.

Measles incidence has greatly decreased all around Europe during the past 10 years because of the generalisation of the two-dose vaccination policy. However, elimination has not yet been achieved and few countries were able to maintain an incidence rate below 1 per 1 000 000 over the past few years. Despite a decreasing incidence overall, a recrudescence of measles was observed in the Netherlands (1999–2000), Spain (2003), Poland (1998) and Lithuania (2002). Since 2000 a significant number of cases are still being observed in France, Germany and Italy.. Concern should be raised about high incidence in 2005 in Romania and Turkey[10], as new member and candidate countries, respectively, to the EU.

While in some countries (e.g. Finland and Denmark) the impact of longstanding, strong two-dose childhood measles-mumps-rubella (MMR) immunisation programmes have successfully interrupted domestic rubella transmission, other countries (e.g. Greece and Italy) have suffered the consequences of infant MMR vaccination programmes implemented at low coverage with a consequent shift in the age of infection to older age groups. Many reports highlight inequalities: both regional and for minority

groups, such as migrant populations in Spain and UK, who are born in countries that lacked rubella vaccination programmes. These inequalities both between and within countries combined with the constant movement of people across Europe mean that rubella in one country can easily affect another and demonstrates the importance of achieving CRI control throughout the Region[11].

For diphtheria, most of the cases from 1995 onwards were occurring in the Baltic States, particularly in Latvia which still observes a small number of cases each year.

Pertussis still dramatically affects some European countries. Close monitoring in all EU countries is needed to better assess the real burden and risk of transmission of pertussis in order to refine control measures. The trend of mumps infection at European level has been increasing since 2002. In 2005, the UK and Ireland experienced a very high incidence of mumps due to outbreaks. In those countries, mumps mainly affected young adults in 2005.

The trend for invasive meningococcal disease in most of the countries was stable or decreasing and varied below an annual incidence of 5 per 100 000. For invasive infections by *Haemophilus influenzae* type b the general trend is difficult to determine due to the incomplete information available. Most of the countries have had a stable incidence rate over the past five years.

A surveillance system for invasive pneumococcal infections is not implemented in all European countries. Where they are established, they may be based on different data collection methods. Therefore differences in the available figures are difficult to interpret. Infection due to *Streptococcus pneumoniae* (pneumococcus) mainly affects the youngest and oldest individuals, and is the main cause of bacterial respiratory tract infections in all age groups. As the vaccine does not cover all serotypes of pneumococci, there is a need for enhanced surveillance both of the occurrence of the disease and the distribution of serotypes.

Finally, the availability of newly marketed vaccines (e.g. Rotavirus and HPV) demands an assessment of the real burden of disease in order to start a proper decision-making process. Baseline data are also required urgently to evaluate the impact of such vaccinations in the near future. With the licensing of these new, relatively expensive vaccines, a resource discussion in the vaccine field is likely to occur in the coming years.

Vaccination coverage

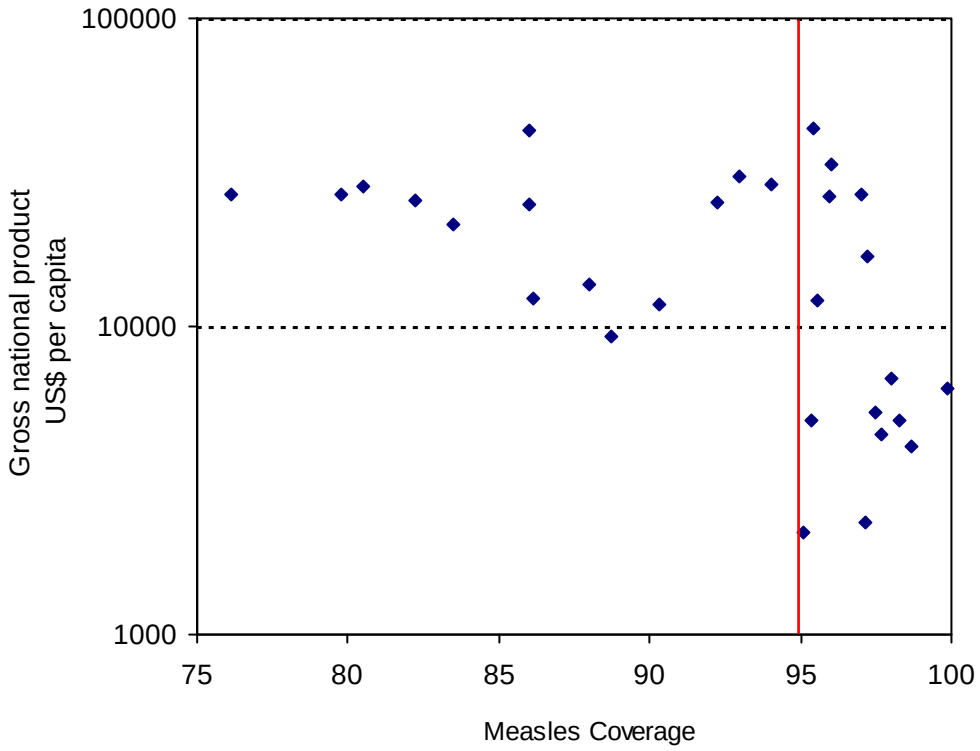
Although Europe has maintained and even enhanced, in general terms, high vaccination coverage, in relation to certain vaccination uptakes, this has experienced a decline over the period, with important consequences for the re-emergence of those diseases and outbreaks. An example is the diphtheria outbreaks during the 1990s in the Russian Federation and the Former Soviet Republics which affected the Baltic States (particularly Latvia). Other important challenges in coming years are to meet the goals of the elimination of measles and congenital rubella and keeping the EU polio-free.

Further, some western European countries have had to cope with a decrease in previously reached vaccine coverage levels (e.g. according to some authors[12], since 2000, MMR coverage in England has declined significantly in virtually all areas of England). Political and socioeconomic changes that followed the collapse of the former Soviet Union, and population density and deprivation in specific inner urban areas[13], were both strongly correlated with lower vaccination uptakes.

Clearly ECDC should be not only involved as the sentinel of the external borders of the EU to avoid importation of CD, but should also be involved in strong advocacy actions, aimed at EU citizens and stakeholders, towards assessing, maintaining and enhancing immunisation levels within the EU, when such diseases might no longer being considered a priority due to their low frequency.

High vaccination coverage is not directly related to the wealth of a country, but with proper public health policies. As an example we have a cluster of countries under the GPD threshold, but with over 95% coverage, most of them in the new eastern Member States.

Figure 5.1.2. Measles coverage in EU and EEA/EFTA countries and gross national product per capita, 2004



Source: WHO CISID database.

Evidence-based actions to improve vaccination coverage, especially in 'hard to reach' groups, should be identified and implemented in lower-coverage settings.

HIV infection, sexually transmitted infections, and blood borne viruses

HIV, other STI and blood-borne viral infections remain a priority in Europe. Again the available surveillance data have to be interpreted carefully due to incomplete and heterogeneous national surveillance systems, which hinder an accurate assessment of the situation in the EU. Nevertheless, the following general trends can be highlighted.

HIV infection

An estimated 700 000 people were living with HIV infection in the EU in 2005. Of them, about one third have not been diagnosed and are unaware that they are infected. In the light of this, testing policies in the EU MS will be reviewed, and best practices identified, leading to agreed policies and commitments to increase the testing uptake. This is an important part of prevention strategies as well as to ensure early treatment of newly infected persons.

Rates of reported HIV infection have increased in the EU since the late 1990s. Increasing numbers of cases are being reported in people infected through heterosexual contact whose origins and initial infection are in high-prevalence countries outside Europe.

Men having sex with men are again emerging as the group at highest risk of acquiring HIV infection in many EU countries. They have a sustained high level of HIV prevalence and incidence. New approaches to reach out to these populations, as well as to migrants from high-prevalence countries, should be researched to ensure the most successful ways of approaching these groups. Infection through intravenous drug use (IDU) seems to be declining slowly across the whole of the EU, despite the fact that the HIV epidemic in the Baltic States is still driven by IDU, and the recent decline in the number of such cases most likely reflects a saturation of the IDU population.

Other sexually transmitted infections

Chlamydia infection is endemic in the EU. It is by far the most frequently reported bacterial infection among the notifiable disease list (99.4 per 100 000), more commonly reported in females than in

males, and disproportionately affecting young people not belonging to any easily identifiable risk group. Broadly increasing trends in *Chlamydia* diagnoses have been observed since the mid-1990s. The increasing notification rates are, however, confounded by concomitant increases in screening rates and the increasing use of the highly sensitive nucleic acid amplification tests. A specific variant of the bacteria gives a more severe systemic disease, LGV. Since 2004, LGV infection has been noted in several large European cities among MSM.

The other STI that are reportable in the EU (gonorrhoea, syphilis, as well as HIV infection) are less frequent and tend to be concentrated in high-risk populations (sometime referred to as 'core groups'), most frequently males. Infection with HPV has received renewed interest as a result of the introduction in 2006 of a vaccine, but is not a reportable disease in most Member States, and figures for prevalence or incidence are generally lacking.

Rates of syphilis and gonorrhoea have been on the increase in many EU countries since the mid-1990s. The increases have occurred in a variety of groups but have been most marked among MSM and residents of major metropolitan areas.

In the Baltic States (as in other countries of the former Soviet Union), reported syphilis cases increased sharply between 1990 and 1997–98. At their height, rates were 200–1 000 times higher than in western Europe. However, the syphilis epidemic seems to have now subsided, with figures continuing to drop.

Table 5.1.2. Incidence of the common STIs with age and gender

Disease	Male to female ratio	Reported cases per 100 000	Most affected age group (years)
Chlamydia infection	0.7	99.4	15–24
HIV infection	1.6	7.4	30–39
Gonorrhoea	4.5	9.5	15–24
Syphilis	4.4	3.5	25–44

Source: EUROHIV; country reports.

Hepatitis B and C

Hepatitis B has to be considered increasingly as an STI, although there is evidence that common practices (tattooing, beauty treatments, etc) are still important in spreading HBV infection. Rates of hepatitis B have declined in the EU over the past 10 years. The infection remains concentrated in migrants from high-prevalence countries and in people whose activities place them at high risk of becoming infected such as injecting drug users and people with multiple sex partners.

Hepatitis C is the most common form of viral hepatitis in the EU, according to available data. Injecting drug users are disproportionately affected, with prevalence over 60%[14].

Public health implications

The importance of controlling STI, taking into account their potentially adverse consequences and their enhancing effect on HIV transmission, and considering the common risk factors, calls for a close integration of HIV and other STI prevention and control measures and for sexual health programmes.

A key challenge now facing Europe is how to get more of the people who are at risk of HIV infection tested and more people who are HIV-infected being diagnosed, so that they are able not only to access treatment and care, but also to avoid transmitting HIV to others.

Immigrants from countries with generalised HIV epidemics represent an important group, posing unique challenges for HIV prevention and care services. The involvement of the affected communities and community-based organisations will facilitate the achievement of common goals and reduce the negative impact of HIV/AIDS in the affected communities.

The rise in HIV diagnoses in MSM coupled with rising incidence of other sexually transmitted infections and increases in reported risk behaviours are of serious concern. Increasing social and sexual networks between MSM across different European countries underline the need for a coordinated European response.

In the Baltic States, while effective interventions for IDUs are centred on the availability of harm reduction programmes, actions to prevent heterosexual and mother-to-child transmission should also be intensified.

Implementing effective chlamydia screening programmes is a challenge but an opportunity for considerable sexual health gain.

For IDU, the frequent co-infection with HIV and HCV, which is associated with a significantly poorer prognosis regarding the hepatitis infection, poses particular clinical challenges.

AMR and healthcare-associated infections

Patient treatment is being increasingly hampered by the relentless emergence of antimicrobial resistance (AMR). AMR is a multi-factorial phenomenon, requiring multidisciplinary control measures. Effective control also requires close cooperation between laboratory scientists, epidemiologists and public health practitioners. Within the hospitals, strict enforcement of hygiene practices is imperative for the successful fight against healthcare-related infections, which often caused by multi-resistant bacteria.

AMR data are currently collected via several networks established prior to ECDC. These data show that for most other bacteria under EU surveillance the overall trend is much more worrying, and AMR is also a major concern with regard to the serious global diseases tuberculosis, malaria and HIV.

Some of the main challenges remaining this area are well known. The laboratories that send data to the EARSS do so only voluntarily and participation across countries shows much variation. There may be big regional differences within countries, which are not visible as the data are currently presented. Data on antibiotic consumption collected by ESAC are difficult to get and come from a variety of sources. Yet, in most countries it has been possible to differentiate antibiotic usage in hospitals and outpatient settings. A prerequisite to be able to follow the trends of resistance patterns is that the methodology for sensitivity testing is the same in all laboratories, and that it is reliable and quality assured. This standardisation is currently successfully done by EUCAST.

Approximately 20–30% of HCAI are considered to be preventable by an intensive infection control programme that includes surveillance. Surveillance of HCAI is difficult. There are problems with standardising HCAI but also with reporting compliance. Most countries don’t have a system for reporting HCAI and where there is such a system it is difficult to evaluate the completeness of the data. Even so, it is important to find an acceptable system, which is the current aim of the IPSE network.

Strategies are needed to reverse the negative trends of antimicrobial resistance and antibiotic consumption, including more awareness-raising among health professionals and the public. More research should be carried out on prescribing habits and the need to develop new antibiotics. Ideally surveillance of AMR should be conducted on three levels: 1) following trends of resistance among certain important pathogens; 2) detecting outbreaks and/or spread of different ’problem’ bacteria; and 3) spotting novel ’super strains‘ where each isolate requires immediate and forceful action Today, EU level (and national) surveillance only covers the first of these. Further developing surveillance of AMR is therefore a priority.

Resistance has also evolved against viral (e.g. HIV, influenza), parasitic (malaria) and fungal infections, giving AMR a wider perspective and a higher priority among all communicable disease threats.

5.2. The economic impact of CD outbreaks and epidemics

Translating risk and impact information into economics

The last decade has seen renewed concern about the impact of CD on societies, both in terms of health and the financial consequences of the spread of diseases and outbreaks. High profile crises such as SARS and avian influenza have shown that in a globalised world these consequences can be very severe and wider-ranging than just the countries directly affected, having an impact on the whole society not just the health sector. Country-specific outbreaks (e.g. vCJD) have also demonstrated how severe an impact can be had on specific sectors of a community. This has given a new impetus and importance to effective disease surveillance, prevention and control within countries and most importantly to collaboration between countries.

Furthermore, the cost and financial aspects of CD outbreaks are now much higher on the public health agenda than previously. Understanding risk and impact information in terms of its consequences (for example, in economic terms) for related sectors and society in general, is crucial to combat and

prevent outbreaks. It also permits better inter-sectoral collaboration and can convince decision-makers to prioritise investment in new resources to prevent CD or to take the most cost-efficient option between alternative interventions, programmes, services or technologies.

Estimated costs can consider everything from healthcare expenses attributable to CD, sick leave and loss of productivity, to considering the financial impact on particular sectors, or the overall economic system of a country. The 2003 SARS outbreak cost China and Canada about 1% of their economies, primarily through lost tourism and travel revenues. In the UK, cases of bovine spongiforme encephalopathy and variant Creutzfeld-Jacob disease in 1995 led to mass cattle slaughters and a three-year beef embargo, costing the British economy US$5.75 billion[15].

Animal diseases pose not only a risk for zoonosis outbreaks, but also a substantial economic burden on the agriculture industry with wider repercussions on rural communities and trade. According to some sources[16], outbreaks of BSE, foot-and-mouth disease (FMD) and avian influenza in 2004 resulted in a fall in the annual world meat trade for the first time in a decade, estimating that the 2001 FMD epidemic cost the UK about £7 billion, including losses in tourism and other indirect effects on the rural economy[17].

Even without the high profile outbreaks, the annual cost of CD is not small. It has been estimated that the annual cost to the UK National Health Service of treating infectious diseases (through GP consultations and hospital admissions) in England is £4.4 billion per annum. This increases to around £6 billion when the two major areas of HIV/AIDS and treatment of hospital-acquired infections are included[18]. Another example from a recent study in the Netherlands has shown that for a population of 16 million in 2004 the annual cost attributable to norovirus was € 25 million, to campylobacteriosis € 22.3 million, to rotavirus € 21.7 million and to salmonellosis € 8.8 million[19].

Cost evaluation analyses: few European studies

The application of economic appraisal methods (cost-minimisation analysis, cost-effectiveness analysis, cost-utility analysis, and cost-benefit analysis) to CD prevention and control can be very useful. Examples of areas where research has been carried out include HIV/AIDS[20], food-borne diseases[21], imported infections related with international travel[22] and vaccination.

Health technology assessment has been an established discipline in Europe for many years. In the last decade this has started to be applied to CD and to provide decision-makers with the necessary information regarding the effectiveness of available health technologies (e.g. vaccines[23] or antiviral drugs[24], use assessment and specific interventions against HIV[25,26], or hepatitis B[27]). Many of these studies have also contributed to the Health Evidence Network (HEN)[28] within the WHO Euro framework.

Cost-utility analyses have been widely developed in the area of public health to support decisions. They are a special case of cost-effectiveness analysis where health effects can be measured in different ways: as quality-adjusted life years (QALYs), which encompasses an intervention's impact on both life expectancy and quality of life; as disability adjusted life years (DALYs) to assess both quantity and quality of life, measured in terms of disability; or others (e.g. healthy year equivalent, HYE).

The Harvard Center for Risk Analysis has developed and maintains a comprehensive registry[29] of cost-utility analyses with a public-use database on the internet[30]. Based on this, a review[31] of all CD-related cost-utility analysis studies conducted between 1980 and 2001, using QALYs as the outcome measure, discovered that only 13.1% (16 out of 122 studies) were aimed at the European population (six out of the 16 were from UK). The majority were aimed at the US population (70.5%). Pharmaceutical interventions were the most common intervention studied (47.5%), followed by immunisation (17.4%) and screening (9.8%). Only 2.3% of listed studies targeted an evaluation of health education and behaviour-related interventions. With regard to specific diseases, HIV/AIDS, Hepatitis C and Varicella/Zoster were the main topics. Across all categories, median cost-utility ratios varied by type of intervention, ranging from $13 500/QALY for immunisations up to $810 000/QALY for blood safety.

According to the authors of the review, the reason for the relatively low proportion of cost-utility analyses in infectious disease literature, as well as the variation in methods found, may be related to the complex modelling that is often used in these analyses. It requires mathematical expertise, and some unique aspects of infectious diseases make economic modelling even more challenging than for other diseases, for instance, the indirect effects of herd immunity or the difficulties in establishing the patients' preferences for their healthcare-seeking behaviour.

Disability-adjusted life year (DALY) was developed in the Global Burden of Disease Study[32]. It is aggregated from disease-specific mortality and morbidity data including an appraisal of the severity of the functional consequences of the disease. The measure makes possible comparisons between

health losses due to mortality and morbidity and health losses attributable to different diseases: the addition of disability results in a more realistic measure of disease burden than that obtained from mortality alone. DALYs may be used to evaluate health policies, to compare intervention alternatives, and to assess risk factors[33]. Examples of advanced European research groups using the Burden of Diseases approach include the UK Health Protection Agency[34] and the Netherlands National Institute for Public Health and the Environment (Rijksinstituut voor Volksgezondheid en Milieu _RIVM)[35].

5.3. The burden of communicable disease: results of a pilot study

As part of the effort in Member States to include wider public health considerations into Annual Communicable Disease Reports, a pilot burden of disease study was carried out in collaboration with RIVM in the Netherlands for the purposes of this first annual ECDC report. The main objectives were to illustrate the potential of the disease burden concept to communicable diseases per se (including data quality and availability aspects); to recommend future studies; and to stimulate debate. The relative disease burden of seven communicable diseases (campylobacteroisis, EHEC infection, HIV infection, influenza, measles, salmonellosis and tuberculosis) were estimated using the composite measure of Disability Adjusted Life Years (DALYs)[36]. These relative comparisons can be useful as one element in the difficult, sensitive and necessary task of indicating where and for which diseases additional actions are a priority.

The pilot has identified a considerable number of limitations with regard to the generally available data and their quality. Despite this, the results show that the relative impact of diseases as measured by disease burden (DALYs) differs from the relative impact as measured by simply incidence or mortality data. Also, among the seven infectious diseases evaluated in this study, HIV infection, tuberculosis and influenza are estimated to cause a higher disease burden relative to the burden of three food-borne diseases (campylobacteriosis, EHEC infection and salmonellosis) and (particularly) measles[37]. The above reflects the balance between threats and the effectiveness of preventive strategies. A low burden stresses the need for continued support for prevention, whereas a high burden indicates the need for additional interventions.

The pilot study recommended that a full burden of disease study for communicable diseases in Europe be carried out, combining and triangulating several methods of investigation (including epidemiological modelling) and taking account of other international efforts in this field.

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6 CD threats monitored

Epidemic intelligence

To achieve rapid detection of previously unknown or emerging international threats, the process of 'epidemic intelligence' is used. Epidemic intelligence can be defined as activities for detecting, verifying, analysing and assessing public health events that may present a threat to public health. Epidemic intelligence, as a function of public health surveillance, encompasses activities related to early warning functions, but also signals assessment and outbreak investigation[1]. The term 'epidemic intelligence' is not familiar to all European Member States (MS) and therefore may cause confusion when translated into some languages. However, this term will be used until better alternatives are defined.

The epidemic intelligence framework separates evolving methods of identifying previously unknown or emerging health threats from the more traditional routine surveillance of prevalent diseases. The framework adopted here therefore distinguishes two complementary surveillance systems, namely indicator-based surveillance and event-based surveillance.

Indicator-based surveillance implies diagnostic or pre-diagnostic indicators upon which events are detected. In the surveillance of prevalent communicable diseases, diagnostic indicators are used when laboratory confirmed diagnoses make it possible to detect abnormal events within the distribution of morbidity and mortality data. In addition, the use of laboratory data can detect changes in characteristics of pathogens, which can also be considered as a diagnostic indicator. The detection of events through laboratory diagnostics may result in a delay of days or even weeks[2].

New approaches are being used to rapidly detect previously unknown or emerging threats. These approaches include 'syndromic surveillance', which is the systematic and ongoing collection, analysis, and interpretation of data that precede diagnosis and that can signal a sufficient probability of an outbreak to warrant public health investigation. Syndromic surveillance aims to signal events earlier by monitoring pre-diagnostic disease indicators like chief complaints and symptoms. Other methods for emerging risk detection include behavioural surveillance (such as school or work absenteeism), monitoring of health service use (such as emergency hospital admissions, drug prescriptions and laboratory test requests), and monitoring of exposures to the environment, food or animals.

Detection of events based on the capture of ad hoc reports is referred to as event-based surveillance. Event-based surveillance is also used for the rapid detection of previously unknown or emerging threats. Data can arise from the active search for information about health events using internet scanning tools, email distributions lists or networks that complement the early warning function of routine surveillance systems.

After verification (event-based surveillance) or analysis and interpretation (indicator-based surveillance), the detected signals are assessed in order to determine the risk that they pose to the population of interest. This assessment allows for defining the resulting actions, which can consist of further investigation in order to address appropriate control measures and/or dissemination of information regarding the signal. Within Europe confidential dissemination can be carried out through the EWRS, Enter-net, WHO or ECDC; public dissemination can be carried-out through *Eurosurveillance*, Health Ministry press releases and websites of WHO and ECDC.

Inclusion of potential threats

In the perspective of epidemic intelligence, potential threats for public health are also called signals. For the detection of these signals ECDC is systematically screening sources on a daily basis. These sources can be divided into three categories: confidential sources distributed by a restricted mailing list; sources for which subscription is necessary; and sources which are publicly disseminated.

Potential communicable disease threats include diseases with a high potential for spread; severe diseases or diseases with limited treatment; diseases that require infection control measures; emerging or resurging diseases; diseases that change spread or resistance patterns; or diseases that are of unknown origin (independent from where in the world they are detected); and at least one of the following:

- Cases occur or are expected in more than one MS.
- Exposure to a source to which citizens from more than one MS may have been in contact (including environmental, food, medical).
- Considerable or unclear risk of importation into Europe through trade and travel.
- Adequate verification and investigation of a threat might require assistance from ECDC and/or partner organisations.
- Affecting a single MS but requiring information of national health authorities of other European MS.
- High media or political attention.

Events which meet one or more of these criteria are included into a Threat Tracking Tool (TTT) for follow-up. After inclusion for follow-up the event is considered an active threat. The decision upon inclusion is made by the epidemic intelligence officer on duty and if necessary in the daily meeting. In addition, all events reported through the EWRS are entered into the TTT.

Threats restricted to international travellers are those caused by pathogens which are not expected to cause secondary cases when diseased travellers come back. Therefore, these threats are currently not followed up by the ECDC.

Threats monitored in 2005

A total of 99 threats were entered into the database in 2005. Of these 99 threats, 46 (46%) affected EU MS and 53 (54%) affected countries which were not members of the European Union.

Of the 46 threats affecting MS, 32 (70%) affected a single country and 14 (30%) affected multiple countries ($p < 0.05$). Of these 14 threats affecting multiple MS, the distribution was as follows: seven threats affected two MS; three threats affected three to five MS; and four threats affected six to eight MS. The threat involving the highest number of MS, i.e. eight, was ‘Salmonella Stourbridge from a French dairy product’. All 14 threats affecting multiple MS were reported through the EWRS.

Five of these 46 threats affected new MS (12%), 38 (88%) affected old MS (EU15) and three threats affected both. The table below (table 6.1) shows that compared with the proportion of the European population (16.5%), the proportion of threats affecting new MS (11.6%) was not significantly different ($p = 0.27$).

Of the 43 threats affecting old (38) and new (five) MS, 29 were reported through the EWRS. Of these 29 threats, five (17%) EWRS messages were issued by new MS and 24 (83%) by old. Table 6.1 shows that compared with the proportion of the European population (16.5%), the proportion of EWRS-reported threats affecting new MS (17.2%) was not significantly different ($p = 0.66$).

GPHIN reported 55 (10%) sources representing new MS and 472 (90%) sources representing old ones. Comparing the 10.4% to 16.5% showed a significant difference ($p < 0.001$) and under-representation of the new members. Twenty-eight (11%) proMED reports represented new MS and 234 (89%) old. Comparing the 10.7% to 16.5% resulted in a significant difference ($p = 0.0054$) and under-representation of the new MS. MedISys reported 200 (24%) sources representing new MS and 650 (76%) sources representing old MS. Comparing the 23.5% to 16.5% resulted in a significant difference ($p < 0.001$) and over-representation of new MS.

Table 6.1. Comparison of the distribution of threats and sources with the European population of new and old Member States

	Population (in million)	All threats	EWRS threats	GPHIN	ProMed	MedISys
Total	454.7	43	29	527	262	850
Old MS	379.85	38	24	472	234	650
New MS	74.85	5	5	55	28	200
% new MS	16.5	11.6	17.2	10.4	10.7	23.5
P value*	—	0.27	0.66	< 0.001	0.0054	< 0.001

*P value for comparison of each of the variables to proportion of population, used as a reference.

There were 14 threats affecting old MS solely reported by public sources. Of these 14 threats not reported via the EWRS, one met the EWRS reporting criteria and 13 did not.

Of these 13 threats, 12 were included in the monitoring process. One threat was not included, because during the daily meeting it was decided that this threat was not a threat of European scope and therefore monitoring was not required.

All five EWRS threats issued by the new MS were solely reported through the EWRS and not through public sources. Of the 24 EWRS threats issued by the old MS, 16 were solely reported through the EWRS and eight were reported through both the EWRS and public sources.

Of the eight threats reported through both the EWRS and public sources, the EWRS message was issued before the threat was reported in public sources in six instances. For the other two threats the EWRS message was issued on the same day as the threat was reported in public sources.

Of 24 EWRS threats affecting old MS, 10 concerned acute diarrhoea/gastroenteritis. The other 14 threats were distributed across multiple categories of disease: four threats concerned acute diarrhoea with haemolytic and uremic syndrome (HUS); four concerned systemic disease; two involved interstitial pneumonia; one was acute colitis/haemorrhagic diarrhoea; one threat concerned meningitis/encephalitis; one concerned prion disease; and one threat concerned 'exposure'. All five EWRS threats affecting new MS concerned acute diarrhoea/gastroenteritis.

For nine of the 99 threats the transmission modality was unknown. Table 6.2 shows the distribution of 90 threats by known transmission modality. Half (54%) of the threats occurred in relation to food- or drink-borne transmission. Of these food- and drink-borne threats, 30 (61%) affected one or more MS and 19 (39%) affected countries which are not members of the EU.

Table 6.2. Proportion of threats detected in 2005, by known transmission modality

Transmission mode	n	%
Food-/drink-borne	49	54
Air-borne	11	12
Droplets	10	11
Vector-borne	10	11
Contact with infected animals	5	6
Apparent/unapparent blood contact	1	1
Contact with contaminated objects	1	1

Sexually transmitted	1	1
Other	2	2
Total	90	

For 25 (25%) of the 99 threats, further action was taken and for 74 (75%) no action was taken beyond verification, assessment and routine monitoring. The frequency distribution concerning the different types of action was as follows:

- For six threats the initial ECDC request was for further information necessary for verification. All these six threats affected countries which are not members of the EU.
- For 18 threats the initial ECDC request was for further information and/or an offer of support for the assessment. Of these 18 threats, 14 affected one or more EU MS and four affected non-EU MS.
- The number of requests for further information per threat ranged from one to 10. The maximum number of 10 concerned the threat 'H5N1 human cases worldwide'.
- For three threats the ECDC participated in a meeting and/or conference call. The number of meetings and/or conference calls per threat ranged from one to four. The maximum number of four concerned the threats 'H5N1 human cases worldwide'.
- For two threats the ECDC participated in a mission. The threat 'H5N1 human cases worldwide' resulted in sending an expert to Hunan, China. The threat 'H5N1 cases inside WHO EURO' resulted in a mission to Romania.

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7 Conclusions

The main overall conclusion of this report is that based on the data available, it appears that the overall incidence of several of the communicable diseases (CD) under surveillance today is low in Europe. Furthermore, the incidence levels for some diseases appear to be very heterogeneous between EU countries and there is an even greater heterogeneity in health services organisation, in the way CD prevention and control is managed and in the structure and organisation of the surveillance systems (which impacts on the comparability of incidence data) not to mention inherent socio-economic differences.

The more detailed analysis of Chapter 4 (which is the foundation for this report) shows that in general EU citizens are reasonably well protected against most communicable diseases. There has been a significant reduction in the incidence and number of cases of some diseases through concerted prevention and control action by Member States. In certain cases (e.g. several of the vaccine-preventable diseases) this has resulted in the disease reaching very low levels in the overall population even though the incidence remains significant in specific risk groups or population segments. In such cases there is the distinct possibility that through concerted and determined action the elimination of certain diseases as a public health problem across the EU may well be possible. In these circumstances the EU (and eventually Europe) could be declared 'free' of the disease to the long-term benefit of all Europeans. The fact that this can be done with concerted and joint action of many partners has been shown most recently by Europe being declared 'polio free' by WHO, with measles as the next such candidate. The goal of eradication remains the ultimate prize, as was done by the WHO-led global eradication of smallpox, which has ensured that EU citizens are equally protected from that disease no matter which part of the world they visit or receive visitors from. Until such time, strict vigilance is essential to ensure that the ever present threat of importation of infection and resurgence to previously high levels does not materialise.

It is recognised, however, that there is a major problem with producing reliable communicable disease data from all Member States at this time – data that is valid for genuine comparisons, and that is collected in a similar fashion. The wide variability in the effectiveness of the present surveillance systems, the differences in prioritisation of resources for surveillance, but also differences in basic issues such as clinical traditions to insist on cultures (or similarly press for confirmation of diagnosis) from patients, make any direct comparison between countries require a careful interpretation. We know that countries with good, enhanced or mandatory surveillance systems in place often appear to have higher incidences of reported diseases, possibly putting their public health services in a poorer light when compared to other countries where the surveillance of communicable disease is given less resources.

The overview of trends for the 49 diseases under surveillance (Table A) indicates why such vigilance is important. Of the 49 diseases, 22 have incidence levels that are in double or triple digits (per million population) with half of the 22 also having rising (or stable) trends. It is of concern that three of the six diseases with the highest incidence in the EU are part of this group of diseases with rising/stable trends; rising trends are also observed for the two diseases with the highest crude incidence levels in the EU (*Chlamydia* infection and campylobacteriosis), but this could be also due to improved surveillance. Fourteen of the above 22 diseases affect the younger age groups (under 24 years) indicating that focused action is needed to protect the health of our future generations. Many of the rest (except TB or legionnaires) affect mainly the economically productive population.

Besides the impact of CD on the health of our present and future generations, the last decade has highlighted the serious economic consequences of the spread of communicable diseases and outbreaks. The recent high profile crises caused by SARS and avian influenza have shown that in a globalised world these consequences can be very severe, affecting many countries and also sectors other than health. The 2003 SARS outbreak cost China and Canada about 1% of their economies, primarily through lost tourism and travel revenues. In the case of pandemics, no part of society and no country will be immune. Country-specific outbreaks (e.g. vCJD) have also shown the huge impact on specific sectors (especially the food and agricultural sectors) with costs of around 10 billion euro per episode in some countries. This has given a new impetus and importance to effective disease surveillance, prevention and control within countries and most importantly also to collaboration between countries.

Irrespective of high-profile outbreaks, the annual cost of the other CDs is also not small. As mentioned in Chapter 5, it has been estimated that the annual cost to the UK National Health Service of treating

infectious diseases could reach £6 billion per year, and working from the estimates in the Netherlands extrapolated to the EU level, these country estimates indicate annual costs in the EU of the order of billions of euro. Of course, these estimates do not reflect the pain and suffering by the patients and their families caused by CD.

7.1 Actions to strengthen prevention, control and surveillance in the EU

The actions indicated for each disease are generally directed towards strengthening of basic public health functions throughout the EU. In practice such actions are and will need to be taken on more than one level (and by different sectors working together) as this is the only way that diseases that do not respect national or sector borders can be tackled. As this is the first EU-wide comprehensive public health report devoted specifically to CD, only some selected EU-level actions are indicated. In future reports further breakdown of these actions to different levels (e.g. Member States, the relevant EU institutions and other key players such as WHO) will be presented taking into account complexity of the roles, responsibilities and mandates within the EU. For the health system the main competencies lie with the Member States. There is a shared competence, however, for public health issues. This presupposes a close collaboration, coordination and interaction between the Member States, Commission and ECDC. While ECDC is an independent agency with a main role in risk assessment (including: to detect the health threats through surveillance and epidemic intelligence; to build up evidence to facilitate and promote a sound decision-making process and give independent scientific advice at the request of MS and/or the Commission and also on its own initiative; and also to promote preparedness and response in the EU), the risk management and control/intervention responsibilities lie with the Member States coordinated by the Commission.

This arrangement acknowledges the responsibility of each Member State regarding the protection of its own population from CD. The other responsibility concerns the fact that an infectious disease problem in one EU country today may well spread to its neighbour or the whole EU tomorrow. Therefore, as regards prevention and control of communicable diseases, the need for solidarity and effectiveness in action among EU Member States is quite different from other elements of health protection.

For the desired level of effectiveness to materialise, a substantial amount of agreement on the overall approaches and technical details is indispensable. Some of the main challenges in this respect explicitly or implicitly inherent in chapters 4 and 5 of this report are outlined below.

Strengthening the CD surveillance systems

A strong integrated European surveillance system that covers all relevant diseases to the required and relevant detail will go a long way towards improving comparability and timeliness. In particular, laboratory data, including data from molecular subtyping need to be integrated into the present EU surveillance systems. Disease-specific surveillance should be further developed according to agreed priorities which serve the future needs. Some important diseases have not been followed with the necessary level of scrutiny at the EU level in the past (e.g. hepatitis B and C), thus a review of the current diseases under EU surveillance should better focus surveillance on those diseases that require the full attention of ECDC and Member States.

As an integral part of the EU surveillance system, regular and continuous data quality controls need to be in place. One specific area is standardised case definitions. Apart from the different national systems for the collection of the data, also the health-seeking behaviour, and the decision trees of physicians for when to submit patient samples for a laboratory diagnosis (which is very often the entry point into the surveillance system) are different in the EU. In order to estimate the 'true incidence', by assessing under-reporting and under-ascertainment for all diseases, procedures need to be established, taking into account the efforts already invested by some of the Member States.

Timely reporting is essential for the early recognition of outbreaks of communicable diseases. While point source outbreaks are usually detected at the local level in the EU Member States, other outbreaks and changes in trend may be detected earlier or only when pooling data from several countries. Outbreak notification systems are therefore needed.

Enhancing the scientific basis for CD prevention and control

Much of today's CD prevention and control is based on solid scientific knowledge. Sharing the evidence, for example, on intervention methods and technologies, understanding of CD determinants and developing better methods for forecasting future CD threats would benefit the development of

guidelines, risk assessments and scientific advice to EU institutions, Member States and the general public. Estimating the burden of infectious diseases in the EU would help to enhance knowledge of their health, economic and social impact and of prevention efforts and be one element to direct the allocation of resources to the best effect. An outline of the first attempt is presented in the report, indicating the potential of this approach and simultaneously pointing out the prerequisites for appropriate future analysis.

The rapid development in molecular biology and other biomedical fields open up new possibilities for better understanding the pathogens, their mode of transmission, and the scope for preventive and therapeutic interventions. Also, good surveillance and response to emerging threats rely heavily on the information that is provided by microbiological laboratories. However, public health microbiology services vary across the EU with public laboratories, designated national reference laboratories, hospital, research or even private laboratories contributing to the information important for public health actions and response. This is inevitably mirrored in the surveillance figures collected from different countries. A more harmonious approach and closer collaboration and coordination would represent an important step to support prevention, and strengthen research capacity, especially in the new Member States, and help improve the overall EU response to CD.

Many EU Member States – as well as other countries – possess impressive CD-related research capacity. However, much could be gained from a catalytic, comprehensive and sustained effort to identify the priority needs for new scientific knowledge from an EU-wide, public health point of view, followed by a concerted initiative to promote the support for such research from EU structures, international foundations and research bodies and institutions.

Increasing EU's capacity to meet CD threats

The EU will have to be ready to face different CD threats in the years to come; some (e.g. an influenza pandemic, the intentional release of biological agents, diseases of unknown origin) could threaten any or all countries, others (e.g. Malaria) would depend on changes in local disease determinants such as climate change or increased tourism. As in most cases early and forceful interventions are essential to limit the health impact of a new threats; early detection, identification, monitoring and intervention is essential, not only for the population first attacked, but also for the protection of the wider EU. This means that it is crucial that a strong EU-level system for Early Warning and Epidemic Intelligence is mirrored in the EU Member States and in neighbouring countries, the rest of Europe and globally in the context of IHR implementation.

Substantial efforts, led by ECDC, have been undertaken during the last few years to develop a more unified and coordinated approach to threat detection, to outbreak investigation and response, as well as to preparedness, throughout the EU. Further refinement and improvement will be based upon experience including specific simulation exercises involving all the Member States, the Commission and other stakeholders such as WHO.

Building stronger human resource capacity for CD prevention and control

Well educated and specially trained professionals are the key to success in all aspects of CD prevention and control. The current situation varies across the EU with a lack of epidemiologists and statisticians in some cases, in others microbiologists, and in yet others clinicians – all requiring training in surveillance, prevention and therapeutic methodologies.

While many good training programmes exist in Member States, much could be gained from their networking in order to provide a more systematic sharing of experience, pooling of expertise for training, development of common inspirational guidelines, and joint organisation of training programmes in some selected areas of CD prevention and control. This would facilitate both Member State and the EU technical capacity to be developed.

Providing better information on CD prevention and control to different target groups

A lot of information is available on CDs in Europe. However, problems can be caused by the great multiplicity of information sources, the sometimes lack of systematic updating, the failure to tailor the information to specific target groups, and the absence of systematic quality control.

Recent experience has shown the importance of targeted authoritative and independent scientific and technical information for professionals and the coordination of public health messages between EU institutions, Member States and other stakeholders directed at the media and the general public (e.g. in the avian influenza scares).

Creating synergy in CD prevention and control through stronger partnerships in Europe

All EU Member States, the EU institutions and several of its centres, international and non-governmental organisations, as well as many institutions at country level, undertake actions that in various ways help protect the citizens of the European countries from CDs. Sometimes their efforts are well coordinated, but other times not, in which case their impact falls far short of their potential.

Thus, there is a need for creating closer partnerships in the years ahead. This applies to Member States, which could profit substantially from being more systematically informed of each other's successes and failures, and which could see the impact of their preventive efforts enhanced when coordinating with their neighbours.

It also applies no less to the Europe-wide level, where the cooperation between ECDC and WHO is already substantially strengthened; a cooperation that needs to be even more extensive and close in the years to come.

Much could also be achieved, including improving the control of CD determinants, through a close cooperation with other sectors (such as food and agriculture), other EU agencies (such as EFSA, EMEA) and several European Commission programmes and Directorates (such as DG Sanco, DG Research, ENP). Partnerships also need to be developed with other actors such as IGOs, NGOs, industry and the research community at large.

The actions outlined above will take concerted effort and time, especially as many require international and multi-agency efforts that build on and support Member State efforts to strengthen the EU national systems for prevention, control and surveillance of CD. Solid national systems in all Member States are essential pre-requisites for a strong EU system, that includes an EU-wide:

- common CD surveillance system operating with unified reporting methods, computerised data transmission and exchange and well focused specific analyses;
- coordinated, and rapidly responding alert and response system for emerging threats from CDs or diseases of unknown origin;
- scientific support function capable of marshalling European and other institutional resources and expertise towards developing better approaches to prevention and control of CDs, including a more 'up-stream' control of CD determinants.

Extending the boundaries of current CDs under surveillance

Decision 2119/98 of the Parliament and the Council and subsequent Commission Decisions created a community network for the epidemiological surveillance and control of communicable diseases in the Community. Decision 2119 also specified the need and importance of collaboration with the competent international organisations, particularly WHO and with non-member countries (Recital numbers 14 and 15). Subsequently on 22 December 1999, Commission Decision (2000/96/EC) listed the CD and special health issues to be covered by epidemiological surveillance (Annex 1) and the criteria for the above selection. The Commission Decision also specified that the list selected for surveillance should be altered in response to changes in disease prevalence and the emergence of new threats (Recital 4).

With the expansion of the EU since that time, non-member countries neighbouring the EU have also changed. This also changes the emphasis placed on the threat of certain diseases and the co-operation and collaboration with non-member countries needs to be kept under review. Surveillance networks such as EpiNorth and EpiSouth (set up under the EU Public Health Programme to bridge specific border areas and deal with cross-border issues) are discussing the need to extend membership and consideration is being given to possible other such networks. There have also been interactions with the relevant Commission Directorate regarding collaboration with non-member countries under the European Neighbourhood Policy Programme. Furthermore, the Commission and WHO (including the relevant Regional Offices: the European and the Eastern Mediterranean Offices) meet at a high level on a regular basis to ensure synergy and joint collaboration and support to non-member countries across a range of health issues, including CD.

The 1999 Commission Decision specified the need to review the list of diseases under surveillance. The initial 1999 list was subsequently amended by Commission Decision No 2003/534/EC and since then SARS, West Nile fever and avian influenza have been added to the list. The criteria specified in Article 2 and Annex II (Commission Decision (2000/96/EC) were:

- Diseases that cause, or have the potential to cause, significant morbidity and/or mortality across the Community, especially where the prevention of the diseases requires a global approach to coordination;
- Diseases where the exchange of information may provide early warning of threats to public health;
- Rare and serious diseases which would not be recognised at national level and where the pooling of data would allow hypothesis generation from a wider knowledge base;
- Diseases for which effective preventive measures are available with a protective health gain;
- Diseases for which a comparison by Member States would contribute to the evaluation of national and Community programmes.

This first comprehensive analysis of the threats posed by communicable diseases in the EU will therefore be a significant input into any further review and amendment of the list of diseases under surveillance along with the revised International Health Regulations.

Some initial considerations are that the added value of EU surveillance for several CDs is questionable and perhaps their continued inclusion in the European surveillance list needs to be re-considered. These CDs include:

- *Brucellosis* is mainly a local problem in a few MS (although data still have to be collected for the zoonosis report).
- *Cholera* is almost exclusively imported, and the risk of any cholera outbreaks inside the Union is minimal. With the revision of the IHR, the obligation to automatically report cholera cases to the WHO will disappear.
- *Echinococcosis* and *leptospirosis* are problems in only a few MS, and cases discovered outside these are mainly medical curiosities of little public health importance.
- *Plague* is nowadays a very treatable disease with little epidemic potential in the EU setting, and will also disappear from the IHR list.
- *Tetanus* cases are an indication of failing national immunization programmes, and should be regarded as such by the national authorities.
- *Toxoplasma* can cause serious disease in those who are infected *in utero*, but any meaningful routine reporting of cases can just not be done. Other surveillance methods must be used.

7.2 Future development of AER

Lessons learnt from the first annual Epidemiological Report on Communicable Diseases

This first annual Epidemiological Report on Communicable Diseases (AER) has been a huge undertaking. Also being the first report it has been quite intensive in its demands on the Member States, surveillance networks and ECDC resources. ECDC appreciates and thanks the many colleagues who generously contributed considerable amounts of their time to help realise this report.

For this year's report ECDC had to use *existing* (large and disparate) datasets, with many difficulties arising, ranging from systematic (e.g. differing absolute numbers and hence differing incidence for same disease for same year(s) for same country) to the process issues (e.g. data submission in various formats, coding errors (e.g. with dates of report), short deadlines, etc.). There were fewer difficulties (but also intensive work) involved in monitoring and collecting threats in the EU since the data collection systems were developed by ECDC more or less from scratch and were relatively established by the time this report was prepared.

The difficulties encountered by the first report should be greatly diminished with the introduction of direct country reporting into one integrated EU database (The European Surveillance System (TESSy)) in Stockholm for all the diseases under EU-wide surveillance. The present division across different systems, applications and formats is untenable and will be discontinued. Also one nominated person from each country should act as the focal point to coordinate all correspondence on the report which should be part of the agreement with the Competent Bodies.

Format of future Epidemiological Reports on Communicable Diseases

For many CD, the annual trends are fairly stable and any changes would be gradual, albeit probably faster than non-CD. This means that the conclusions to be drawn for corrective and preventive actions (especially those referring to the determinants of transmission of infection) will probably not change much from year to year. Therefore we see the need to weigh the efforts involved (in the production every year of a comprehensive AER covering all 49 CD in the same depth) with the potential benefits for the surveillance and control of disease in the EU and EEA/EFTA countries. However, there are statutory requirements to provide an annual assessment of threats and also the ECDC approved work plan requires the production of an annual epidemiological report. Under these circumstances, ECDC proposes that Public Health Reports on CD in the EU should consist of a suite of inter-related and complimentary reports that aim to maximise the benefits while presenting a minimal burden on the Member States and other contributors.

Being the first European Epidemiological Report specifically devoted to CD, the 2005 AER was designed to provide a broad baseline (based on 10-year trends) as well as a more detailed analysis of the situation in 2005. It also includes other aspects (such as determinants, health service impacts, burden of disease, costs, etc.) to at least indicate the direction and scope for future reports. Clearly the future reports should be stronger with more in-depth analyses, including more statistical analysis and possibly modelling where relevant, even though in this first attempt (as was pointed out many times) the very short timescales and the readily available data (and their quality, completeness and consistency weaknesses) restrict the depth, quality and scope of the analysis.

It is clear that to produce another version similar to this first report also for 2006 is neither feasible nor desirable. Therefore it is planned that such comprehensive reports are not produced every year. Perhaps, since CD trends are more changeable than NCD, the frequency of the AER could be every three (or possibly five years), although the annual data, in the form of standard tables and graphs will still be available on a year-by-year basis in smaller reports or on the website.

The contents and coverage of such 3–5 year comprehensive AER would closely follow the contents of this 2005 report. However, these contents would be significantly developed and expanded given that there would be a longer lead time for production and as experience of producing such reports grows. The areas described in the ‘action’ Chapter 7 of such a report would also indicate the priorities for the ECDC strategic multi-annual work plan (updated every seven years).

In between, annual ’subject oriented’ Epidemiological Reports on selected CD will be published. The ECDC Founding Regulation requires that an annual report on the health threats identified and addressed during the previous year be published. Furthermore, a gap of 3–5 years before any information on CD in the EU is published maybe both unacceptable and unwise. Therefore it is proposed to produce an annual report (except for those years when the full comprehensive AER is produced) whose main elements are:

- The threats monitored and actions taken in the previous year (as required by the ECDC Founding Regulation);
- In-depth coverage of one (or two) CD which are chosen from a list of priority CDs suggested by the epidemiological evidence from the most recent 3–5 year full comprehensive AER;
- In addition an annual update of the basic CD data and overall CD trends in the EU would be included as part of the above.

At the same time The TESSy database is being developed to ensure that MS can carry out online electronic updates and validation of their CD data. An additional advantage of this new system would be the possibility providing a periodically updated short summary of the overall trends in CD in the EU on the webpage (a comprehensive analysis of which would of course be in the 3–5 year AER). So the data on CDs would be available online to anyone who is interested in looking at the website for it.

An annual Executive Summary version will continue to be distributed for all those interested, especially the country policy makers. Also in the future there will be a need for different formats of the report to be developed (e.g. web interactive or html versions) in order to address different target audiences.

Annex 1 List of communicable diseases for EU surveillance

Annex I of Commission Decision 2000/96/EC of 22 December 1999 on the communicable diseases to be progressively covered by the Community network under Decision No 2119/98/EC of the European Parliament and of the Council, as amended by Decisions 2003/534/EC and 2003/542/EC.

1 Communicable diseases and special health issues to be progressively covered by the community network

1.1 For the diseases/health issues listed below, surveillance within the Community network will be performed by standardised collection and analysis of data in a way that will be determined for each disease/health issue when specific Community surveillance networks are put in place.

2 Diseases

2.1 Diseases preventable by vaccination

Diphtheria

Infections with haemophilus influenza group B

Influenza

Measles

Mumps

Pertussis

Poliomyelitis

Rubella

Smallpox [*added by Commission Decision No 2003/534/EC*]

Tetanus [*added by Commission Decision No 2003/534/EC*]

2.2 Sexually transmitted diseases

Chlamydia infections

Gonococcal infections

HIV-infection/AIDS

Syphilis

2.3 Viral hepatitis

Hepatitis A

Hepatitis B

Hepatitis C

2.4 Food- and water-borne diseases and diseases of environmental origin

Anthrax [*added by Commission Decision No 2003/534/EC*]

Botulism

Campylobacteriosis

Cryptosporidiosis

Giardiasis

Infection with Enterohaemorrhagic E.coli

Leptospirosis

Listeriosis

Salmonellosis

Shigellosis

Toxoplasmosis

Trichinosis

Yersinosis

2.5 Other diseases

2.5.1 Diseases transmitted by non-conventional agents

Transmissible spongiform encephalopathies variant (CJD)

2.5.2 Air-borne diseases

Legionellosis

Meningococcal disease

Pneumococcal infections

Tuberculosis

2.5.3 Zoonoses (other than in 2.4)

Brucellosis

Echinococcosis

Q-Fever [*added by Commission Decision No 2003/534/EC*]

Rabies

Tularaemia [*added by Commission Decision No 2003/534/EC*]

2.5.4 Serious imported diseases

Cholera

Malaria

Plague

Viral haemorrhagic fevers

3 Special health issues

3.1 Nosocomial infections

3.2 Antimicrobial resistance

Additional diseases

In addition to the diseases listed above, the Commission has informally included Avian influenza, SARS and West Nile fever.

Annex 2 Surveillance systems in EU and EEA/EFTA countries

Introduction and method

The Annual Report presents figures, charts and analyses concerning infectious diseases in different countries in Europe. In many cases the comparability of the figures is problematic because the data are obtained from different surveillance systems.

To facilitate the assessment of the comparability of the data for any disease a short description is given of the surveillance covering each one. These data have been collected from the countries by means of a web-based questionnaire that was completed by the representatives of the Member States and the EEA/EFTA countries to the ECDC Advisory Forum.

Recognising that in many cases a surveillance system covers more than one disease, the questionnaire was designed in such a way as to avoid the need to describe each system more than once. At the end of the questionnaire it was possible to check all the diseases covered by the system. For each system a separate questionnaire should have been filled in.

The questionnaire requested the following information.

- Short name of the surveillance system.
- Legal character:

– *Compulsory.* The surveillance system has a legal basis (at the national administrative level or other) where it is stated that reporting of cases of the disease(s) under surveillance is compulsory.

– *Voluntary.* The surveillance system is based on a voluntary agreement (at the national level or other) where it is stated that reporting of cases of the disease(s) under surveillance is on a voluntary basis.

– *Other.* Any system that does not fall under either of the above descriptions.

- Comprehensiveness:

– *Comprehensive.* Reporting is based on cases occurring within the whole population of the geographical area where the surveillance system is set up (national, regional, etc).

– *Sentinel:* Reporting is based on a selected group of physicians, hospitals, laboratories, or other institutions' notifications and/or cases occurring within a selected group of the population defined by age group, gender, exposure or other selection criteria.

– *Other.* Reporting is based on a part of the population or group of physicians (or other institutions) which is not specified, for example reporting of some laboratories with no selection criteria.

- Active/Passive:

– *Active.* The surveillance system is based on the public health officials' initiative to contact the physicians, laboratory or hospital staff or other relevant sources to request data.

– *Passive.* The surveillance system relies on the physicians, laboratory or hospital staff or other relevant sources to take the initiative to report data to the health department.

- Case-based:

– *Case-based.* Each individual case of the disease(s) under surveillance is reported separately to the national level.

– *Aggregated.* Only the total number of cases of the disease(s) under surveillance is reported to the national level (possibly broken down by age, sex and/or other criteria).

- Available information at the national level:

– *Clinical information.* The surveillance system usually provides clinical information on the cases.

– *Laboratory-confirmation.* The surveillance system usually provides information on laboratory-confirmation for the cases.

– *Epidemiological links.* The surveillance system usually provides information on whether or not a case is epidemiologically linked to a laboratory-confirmed case.

- Reporting Entities:

– *Physicians/clinicians.* Reported cases are provided to the responsible health department directly by physicians (general practitioners, or specialists working in primary health care clinics or hospitals, public or private institutions).

– *Hospitals.* Data are provided to the responsible health department through specific hospital units, for example emergency departments provide all the cases of the disease under surveillance.

– *Laboratories.* Cases are reported to the responsible health department directly by laboratories.

– *Others.* Cases are reported to the responsible health department by other sources, for example population, schools, homes for the elderly, etc.

- Case definition used.

– *EU case definition.* Reporting of cases is based on the European Union case definition laid down in Commission Decisions 2002/253/EC and 2003/534/EC.

– *Other case definition.* Reporting of cases is based on other case definitions (national, regional, other international institutions, Dedicated Surveillance Networks, etc).

– *None.* No case definition is used.

- National coverage.

– *Yes.* The surveillance system covers the whole country.

– *No.* The surveillance system covers only a defined part of the country, for example some regions.

- National reference laboratory data:

– *Yes, universal submission:* All lab samples are sent to the National Reference Laboratory and the positive results are available at the national level.

– *Yes, representative submission* A representative number of laboratory samples is sent to the national reference laboratory and the positive results are available at the national level.

– *Yes, sporadic submission.* An unrepresentative number of lab samples is sent to the national reference laboratory and the positive results are available at the national level.

– *No.* National reference laboratory data are not the same as the national notification data.

- Comparable data available from (year).
- Diseases that should be under surveillance in the EU covered by the surveillance system.
- Space to list other diseases covered by the surveillance system.
- Space for comments.

Results

As of 7 November 2006, 25 of 28 (89%) countries have filled in the questionnaire and described 279 surveillance systems. In some cases there are only minor details for different diseases that required a separate questionnaire for each disease. The countries that did not submit a description are:

- Greece,
- Liechtenstein, and
- Luxembourg.

Of the 49 diseases and health issues under surveillance (see Annex 1) in Europe, 22 (43%) have an established surveillance system in each of the 25 countries that replied. The diseases and health issues with the least surveillance are nosocomial infections (only 14 countries have a surveillance system in place), cryptosporidiosis (16 countries), West Nile fever (17 countries), toxoplasmosis and antimicrobial resistance (18 countries).

The analysis of the variables is shown in the tables below.

		Number of Surveillance Systems	Percent
Legal Character			
	Compulsory	147	52.7
	Not specified/unknown	1	0.4
	Other	38	13.6
	Voluntary	93	33.3
Comprehensiveness			
	Comprehensive	214	76.7
	Not specified/unknown	2	0.7
	Other	9	3.2
	Sentinel	54	19.4
Active/Passive			
	Active	80	28.7
	Not specified/unknown	3	1.1
	Passive	196	70.3
Case-based			
	Aggregated	40	14.3
	Case-based	235	84.2
	Not specified/unknown	4	1.4

Available information the national level			
	Clinical information		
		No	106	38.0
		Not specified/unknown	26	9.3
		Yes	147	52.7
	Laboratory confirmation		
		No	26	9.3
		Not specified/unknown	41	14.7
		Yes	212	76.0
	Epidemiological links		
		No	131	47.0
		Not specified/unknown	48	17.2
		Yes	100	35.8
Reported by			
	Laboratories		
		No	49	17.6
		Not specified/unknown	38	13.6
		Yes	192	68.8
	Physicians		
		No	93	33.3
		Not specified/unknown	8	2.9
		Yes	178	63.8
	Hospitals		
		No	80	26.7
		Not specified/unknown	41	14.7
		Yes	158	56.6
	Others		
		No	114	40.9
		Not specified/unknown	50	17.9
		Yes	115	41.2
Case definition			

	EU case definition	124	44.4
	None	11	3.9
	Not specified/unknown	6	2.1
	Other case definition	138	49.5
National coverage			
	No	27	9.7
	Not specified/unknown	9	3.2
	Yes	243	87.1
National reference laboratory data compatible			
	No	76	27.2
	Not specified/unknown	39	14.0
	Yes, representative submission	35	12.5
	Yes, sporadic submission	61	21.9
	Yes, universal submission	68	24.4

For 178 of the 279 (64%) surveillance systems the information has been given back to the year for which comparable data are available. This ranges from 1939 to 2006.

All 23 countries have at least one surveillance system in place that is legally compulsory. Voluntary systems are in place mainly for antimicrobial resistance (14 out of 17: 67%), nosocomial infections (11 out of 20: 55%) and influenza (19 out of 36: 44%).

Most systems (214: 77%) are comprehensive. Sentinel systems are mainly in place for influenza (17 out of 37: 47%), antimicrobial resistance (7 out of 21: 33%), chlamydia infections (9 out of 29: 31%), nosocomial infections (6 out of 20: 30%), gonococcal infections (10 out of 36: 27%) and syphilis (9 out of 35: 25%).

For most diseases and health issues surveillance systems are mainly passive. Only for nosocomial infections are most of the systems (12 out of 20: 60%) active.

Most countries have case-based data at the national level for the diseases with an established surveillance system. Lithuania (49 diseases/health issues) and Austria (37 diseases/health issues) have mainly or exclusively aggregated data. Estonia has aggregated data for 16 of the 50 diseases/health issues under surveillance.

Most surveillance systems have case definitions for the diseases under surveillance (240 out of 257: 93%). Some countries have many more diseases/pathogens under surveillance than required by Decision No 2003/542/EC. The list will serve as an input to the discussions on the future objectives of surveillance of infectious diseases in Europe.

Example of how to present the overall results

		Legal character	**Case-based**	

Disease group	Disease	Compulsory	Voluntary	Other	Case-based	Aggregated	Total
Air-borne diseases							
	Legionellosis	29	4	1	32	2	34
	Meningococcal disease	29	6	1	34	2	36
	Pneumococcal infections	16	10	1	25	2	27
	Tuberculosis	29	2	1	29	3	32
Antimicrobial resistance							
	Antimicrobial resistance	7	14		17	4	21
Diseases transmitted by non-conventional agents							
	Transmissible spongiform encephalopathies variant (vCJD)	25	4		27	2	29
Food- and water-borne							
	Anthrax	26	3		27	2	29
	Botulism	26	3		27	2	29
	Campylobacteriosis	20	7	1	25	3	28
	Cryptosporidiosis	14	4	1	17	2	19
	Giardiasis	17	4	1	20	2	22
	Infection with Enterohaemorhagic *E. coli*	24	7	1	30	2	32
	Leptospirosis	22	5	1	26	2	28
	Listeriosis	23	8		28	3	31
	Salmonellosis	24	7	1	29	3	32
	Shigellosis	24	6	1	28	3	31
	Toxoplasmosis	14	4		15	3	18
	Trichinosis	22	3		23	2	25
	Yersiniosis	19	6	1	23	3	26

Nosocomial infections							
	Nosocomial infections	8	11	1	19	1	20
Serious imported diseases							
	Cholera	27	5	1	31	2	33
	Malaria	26	4	2	29	3	32
	Plague	26	3	1	28	2	30
	Viral haemorrhagic fevers	24	3	1	26	2	28
Sexually transmitted diseases							
	Chlamydia infections	17	12		23	6	29
	Gonococcal infections	24	12		31	5	36
	HIV infection	22	13	2	32	5	37
	Syphilis	24	11		31	4	35
Vaccine-preventable disease							
	Diphtheria	27	4	1	30	2	32
	Infection with haemophilus influenzae type B	25	6	1	30	2	32
	Influenza	18	16	1	24	11	35
	Measles	27	8	1	33	3	36
	Mumps	23	6	1	27	3	30
	Pertussis	25	6	1	29	3	32
	Poliomyelitis	26	5	1	29	3	32
	Rubella	24	6	1	29	2	31
	Smallpox	18	1	1	18	2	20
	Tetanus	23	1	1	23	2	25
Viral Hepatitis							
	Hepatitis A	26	7	1	30	4	34

	Hepatitis B	27	8	2	32	5	37
	Hepatitis C	25	9	2	31	5	36
Zoonoses							
	Brucellosis	24	4	1	27	2	29
	Echinococcosis	20	3		21	2	23
	Q fever	20	6		24	2	26
	Rabies	25	3	1	27	2	29
	Tularaemia	20	3		21	2	23

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