

INFANT MORTALITY FROM RESPIRATORY DISEASES

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Annual death rate due to respiratory diseases in children over one month (post-neonatal) and under one year of age

This summary gives an overview of death rates in early childhood due to respiratory diseases and changes over time in countries of the WHO European Region. It provides information about possible environment-related risk factors and relevant policy action.

KEY MESSAGE

☺ Over 12% of infant deaths in the Region are due to respiratory diseases. However, there are considerable variations in the rate across the Region, with a gradual increase from western to eastern European countries. Infant death rates from respiratory diseases declined in nearly all countries in the period 1997–2006. Several countries have eliminated respiratory diseases as the cause of post-neonatal death.

RATIONALE

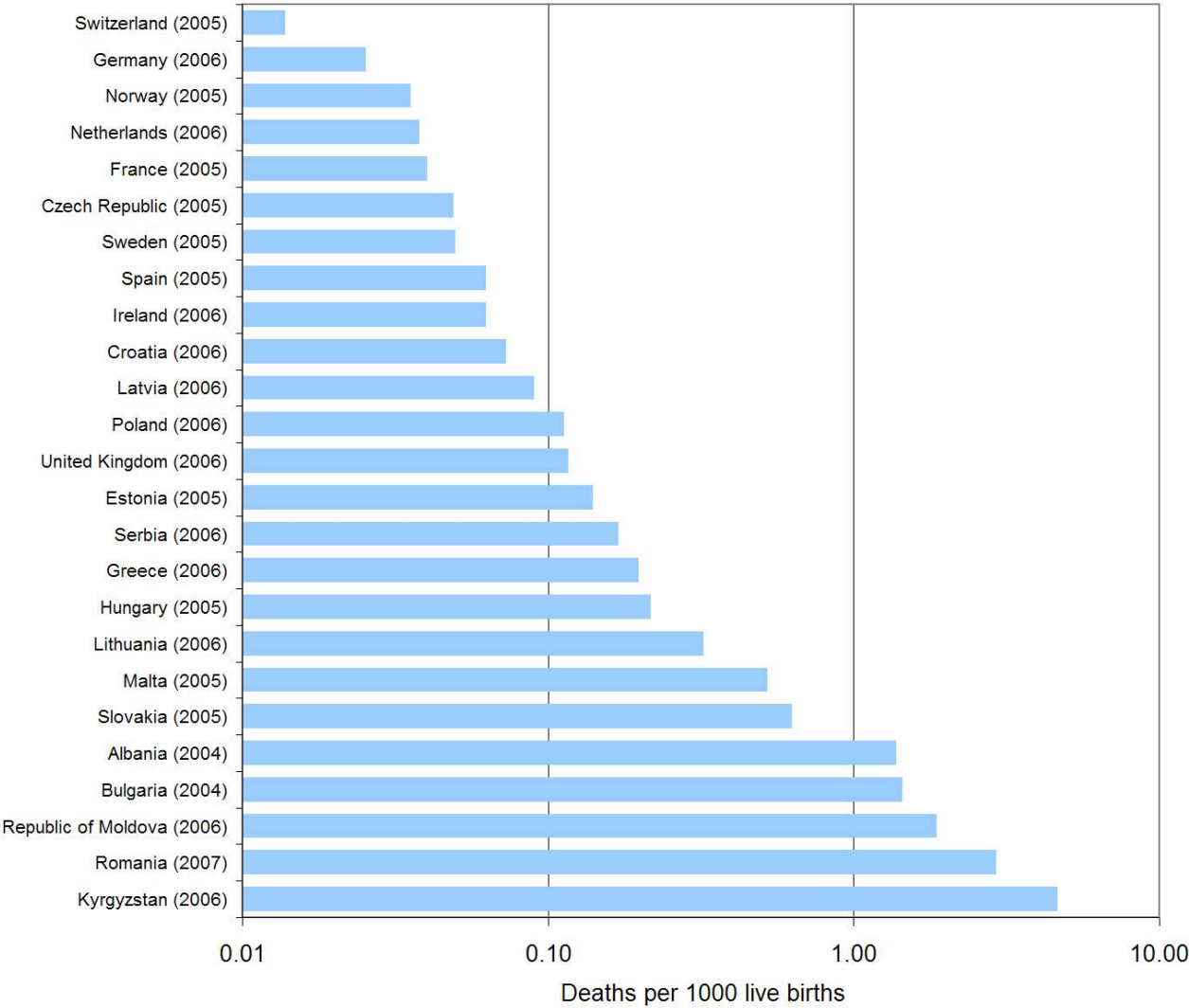
The indicator gives an indirect assessment of the adverse effects on health of environmental factors in a vulnerable age group. The post-neonatal infant death rate from respiratory diseases depends on many different factors, including indoor and outdoor air pollution.

PRESENTATION OF DATA

Fig. 1 presents the post-neonatal infant death rate due to respiratory diseases for the last available year for 25 countries. Data are available in the WHO mortality database (1) and the WHO European health for all database (2) for 34 Member States of the Region, although for certain countries (Israel and the former Yugoslav Republic of Macedonia) the latest available data are for 2000 and before. The average for all countries is 0.5 per 1000 live births.

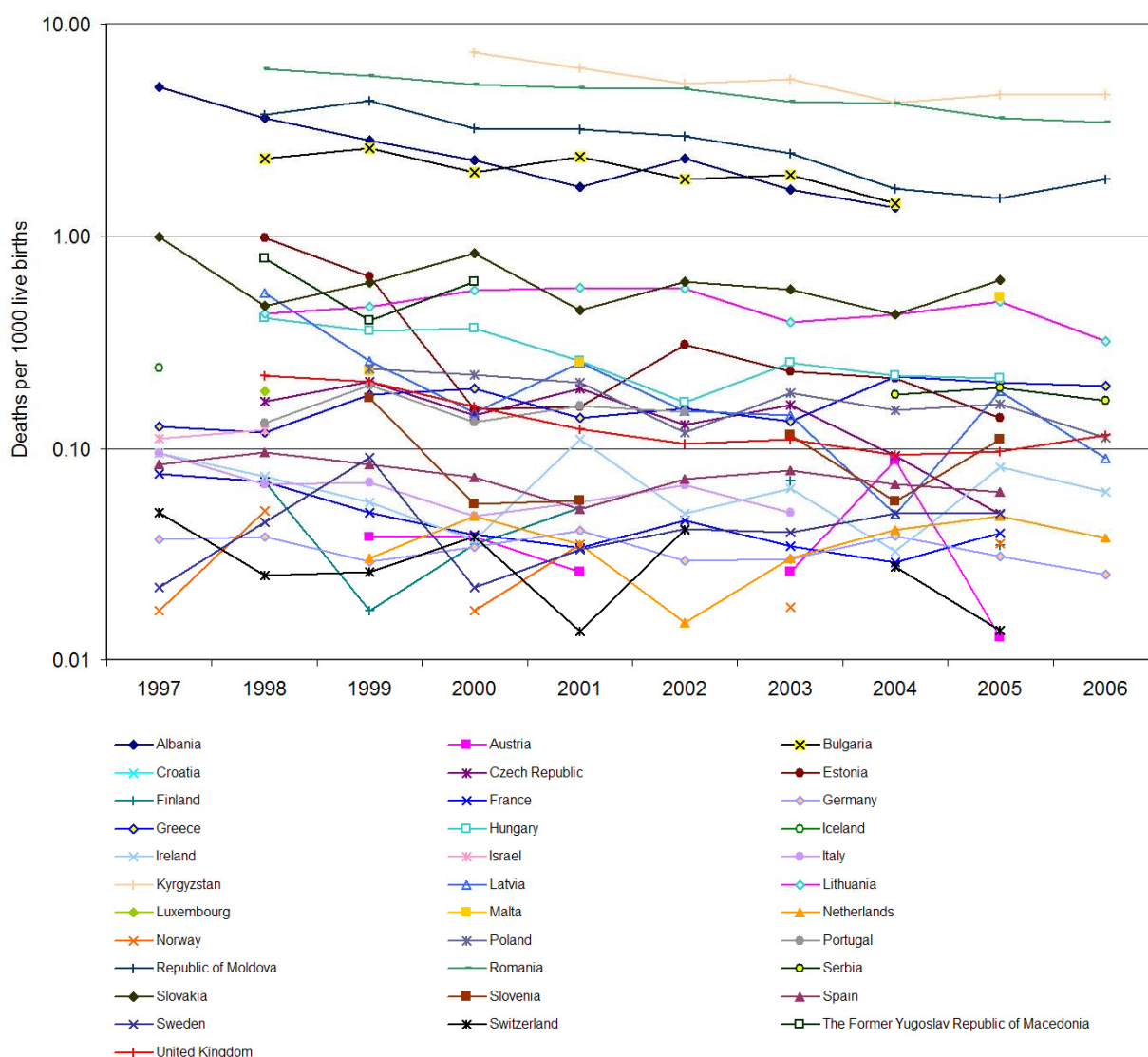
Fig. 2 shows changes in the post-neonatal infant death rate due to respiratory diseases in the Region from 1997 to 2006. The average number of post-neonatal deaths due to respiratory diseases is presented in a logarithmic scale. Four countries (Austria, Finland, Luxemburg and Slovenia) had no neonatal deaths from respiratory diseases during the period: this is not shown on the graphs.

Fig. 1. Post-neonatal infant death rates due to respiratory diseases in 25 Member States of the WHO European Region, most recent year since 2004



Source: WHO mortality database (1) and WHO European health for all database (2).

Fig. 2. Changes in post-neonatal infant death rates due to respiratory diseases in 34 Member States of the WHO European Region, 1997–2006



Source: WHO mortality database (1) and WHO European health for all database (2).

HEALTH AND ENVIRONMENT CONTEXT

Respiratory illness is the most common cause of childhood morbidity in industrialized countries, although serious morbidity is low in the 15 countries that comprised the European Union (EU) before April 2004 (3). In developing and emerging economies, acute lower respiratory infections (ALRI), particularly pneumonia, are common causes of death and serious morbidity in young children and infants. Causative infective agents differ between developed and developing regions of Europe: bacterial infections are common in developing countries while viral infections cause most ALRI in developed countries. In temperate European countries, there is a marked variation with the seasons in ALRI, with a significant rise in incidence in the winter months falling to relatively low levels in the summer.

Studies have found that there is a positive association between the level of air pollutants and death rates due to respiratory causes in children. Consequently, an increase in respiratory death rates in infants may indicate higher indoor or outdoor air pollution levels and, conversely, decreasing rates may indicate improved air quality (4). However, caution should be exercised in such interpretations.

Further to this, the association between respiratory death rates in infants and ambient air pollution is not simple. Many forms of respiratory illness occur and there are numerous causes, including outdoor air pollution, pollutants and allergens in the home (such as the use of solid fuel for cooking and heating, tobacco smoke and dust) and infectious agents (5). Diet, lifestyle, the environment and social factors may also be important, possibly with a synergistic effect. Countries with high respiratory death

rates in infants should generally be able to reduce total infant mortality significantly by implementing policies that address the causes of respiratory illness.

POLICY RELEVANCE AND CONTEXT

In 2004, the Fourth Ministerial Conference on Environment and Health adopted the Children's Environment and Health Action Plan for Europe (CEHAPE), which includes four regional priority goals to reduce the burden of environment-related diseases in children. One of the goals (RPG III) aims at preventing and reducing respiratory diseases due to outdoor and indoor air pollution, thereby contributing to a reduction in the frequency of asthma attacks and ensuring that children can live in an environment with clean air (6).

The following EU directives aim to achieve the ultimate goal of European clean air policy, which is to attain levels of air quality that do not give rise to significant negative effects on or risks to human health and the environment.

- The Air Quality Framework Directive 96/62/EC (7) on the assessment and management of ambient air quality sets the quality standards for particulate matter, nitrogen dioxide, sulfur dioxide and ozone (updated by Directive 2002/3/EC), as well as common methods and criteria for assessing and managing pollutant levels.
- Council Directive 1999/30/EC (8) relates to the limit values for particulate matter, nitrogen oxides, nitrogen dioxide, sulfur dioxide and lead in ambient air.
- Directive 2000/69/EC (9) relates to the limit values for benzene and carbon monoxide in ambient air.
- Directive 2002/3/EC relates to ozone in ambient air (10).

In addition, the Sixth Community Environment Action Programme called for the development of a thematic strategy on air pollution with the objective of attaining "levels of air quality that do not give rise to significant negative impacts on and risks to human health and the environment" (11). This strategy, prepared by the Clean Air for Europe programme, was adopted in September 2005. EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe introduced new targets for air quality and requires a gradual reduction in population exposure to particulate matter (12).

WHO published its first Air quality guidelines for Europe in 1987, with a second edition in 2000 (13). After partial updating in 2005, the fully revised WHO air quality guidelines have now been published (14). According to WHO's assessment of the burden of disease, more than two million premature deaths each year worldwide can be attributed to the combined effects of indoor air pollution from the use of solid fuel (approximately 1.5 million deaths) and urban outdoor air pollution (approximately 800 000 deaths) (5).

ASSESSMENT

On average, 12.9% of post-neonatal deaths in European countries are due to respiratory diseases and these diseases cause 0.5 deaths per 1000 live births. This average rate, however, masks wide variations ranging from zero deaths per 1000 live births in Austria, Finland, Luxembourg and Slovenia to 4.6 per 1000 live births in Kyrgyzstan. In general, rates are considerably higher in eastern than in western Europe.

A downward trend in infant respiratory death rates has been evident in recent years in many countries with high rates, such as Albania, Kyrgyzstan, the Republic of Moldova and Romania. Even so, rates in those countries remain considerably higher than in the rest of Europe. Mortality data from 2006 show that respiratory diseases contributed substantially to the overall post-neonatal infant death rate in Romania (55.7%), Kyrgyzstan (52.6%) and the Republic of Moldova (38.9%). A major cause of the high infant death rates seen in eastern Europe is the relatively worse economic and environmental situation in those countries, which could also be why a greater proportion of acute respiratory infections are severe.

Countries in western Europe show very low infant mortality rates from respiratory diseases, most probably because of more effective medical services and advanced environmental protection policies. Current infant death rates from respiratory diseases, though very low, are more likely to be associated with increasing antimicrobial resistance, the emergence of novel pathogens or the lack of effective antiviral medications. In general, however, respiratory illness is detected early and treatment instituted rapidly.

DATA UNDERLYING THE INDICATOR

Data source

1. WHO mortality database (1).
2. WHO European health for all database (2).

Description of data

Annual number of deaths in children aged 28–364 days caused by respiratory diseases, and number of live births.

Method of calculating the indicator

The number of deaths per 1000 live births is calculated by dividing the annual number of deaths in children aged 28–364 days caused by respiratory diseases by the number of live births and multiplying the result by 1000.

Geographical coverage

Thirty-four countries in the European Region, most of them members of the EU.

Period of coverage

1997–2006.

Frequency of update

Annual.

Data quality

Data are based on national statistics. The constitutional mandate of each Member State is to establish and maintain statistical services and provide information in the field of health.

This fact sheet presents the latest available data for 1997–2006. As these data are relatively old, new efforts are needed to monitor and reveal the current trends of such a dynamic indicator. Data for a number of countries (e.g. Denmark, Belgium and Monaco) are older than 1996. At the same time, geographical coverage should be improved to include data from all 53 Member States of the WHO European Region. Many countries have not reported their data to the WHO mortality database for each year in the time series, or have reported only one of the two parameters needed for calculating the indicator.

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FURTHER INFORMATION

Exposure of children to second-hand tobacco smoke. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 3.4, www.euro.who.int/ENHIS)

Exposure of children to air pollution (particulate matter) in outdoor air. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 3.3, www.euro.who.int/ENHIS)

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