



Health and Environment in Europe: Progress Assessment



ABSTRACT

This report describes the progress made by the WHO European Member States in improving their health and the environment situation over the last 20 years. The assessment focuses on the aspects of health related to clean water and air, to environments supporting safe mobility and physical activity, chemical safety, noise and safety at work. These are the environment and health issues arising from the four regional priority goals of the Children's Environment and Health Action Plan for Europe (CEHAPE), agreed at the Fourth Ministerial Conference on Environment and Health in 2004. The information collected by the European Environment and Health Information System forms the basis for the analysis. The report also presents the public governance and healthy public policy aspects of national policies on environment and health. The implementation of the CEHAPE in countries, its impact and challenges related to it are summarized using the information collected through the web-based survey on CEHAPE conducted in November 2009.

KEYWORDS

Environmental health
Program development
Water quality
Air pollution - prevention and control
Child welfare
Physical fitness
Europe

ISBN 978 92 890 4198 0

© World Health Organization 2010

All rights reserved. The Regional Office for Europe of the World Health Organization welcomes requests for permission to reproduce or translate its publications, in part or in full.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either express or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use. The views expressed by authors, editors, or expert groups do not necessarily represent the decisions or the stated policy of the World Health Organization.

Address requests about publications of the WHO Regional Office for Europe to:

Publications
WHO Regional Office for Europe
Scherfigsvej 8
DK-2100 Copenhagen Ø, Denmark

Alternatively, complete an online request form for documentation, health information, or for permission to quote or translate, on the Regional Office web site (<http://www.euro.who.int/pubrequest>).

Text editors: Malcolm MacGarvin, Rosemary Bohr
Designed by Aleen Squires
Printed by Stabilimenti tipografici Colombo



Health and Environment in Europe: Progress Assessment

Contents

Executive summary	i
Résumé	v
Kurzfassung	x
РЕЗЮМЕ	xv
Introduction	1
Objectives of the report and questions it answers	2
Country groupings	3
Methods of policy survey and policy analysis	3
Clean water - a basic human right	5
Key messages	5
Public health importance	5
Water-related diseases are persistent but decreasing	5
Water-related health determinants: geographical and time patterns	6
Access to improved water supply: disparities within and between countries	6
Wastewater collection, treatment and sanitation: pronounced country differences	10
Safe bathing water: faltering progress	10
Emerging issues	14
Co-benefits of providing improved drinking-water, sanitation and wastewater treatment	14
Water, sanitation and health: policy analysis	15
Public governance	16
Healthy public policy	17
Transparency and communication	20
Overall progress	21
References	21

Be mobile, active - and safe!	23
Key messages	23
Injuries and physical inactivity: public health importance	23
Unintentional injuries	23
Road traffic injuries – a leading cause of death	24
Unsafe homes and neighbourhoods	27
Excess weight and obesity: an epidemic	28
Physical activity: getting active	28
Potential health benefits from mitigating climate change	32
Injuries, health and safety: policy analysis	33
Public governance	34
Healthy public policy	37
Transparency and communication	38
Overall progress	38
References	39
Clean air for health	41
Key messages	41
Clean air and its public health significance – new insights	41
The burden of respiratory disease	42
Outdoor air pollution and its impact on health in Europe	45
Exposure to indoor air pollution	49
Second-hand tobacco smoke	49
Exposure to products of indoor combustion	50
Exposure to damp	53
Synergies between climate change mitigation and cleaning the air	54
Air quality and health: policy analysis	55
Public governance	56
Healthy public policy	59
Transparency and communication	62
Overall progress	63
References	63
Eliminating environmental health hazards	67
Key messages	67
Chemical hazards	68
Exposure to chemical hazards	68
Food safety and chemical safety aspects of heavy metals: policy analysis	74

Overall progress	81
References	81
Environmental noise	83
Exposure to environmental noise and its health effects	83
Policies on environmental noise	84
References	88
Occupational health	89
Work-related health problems	89
Policy considerations	92
References	92
Implementing the Children’s Environment and Health Action Plan for Europe: the role of intersectoral collaboration	95
National CEHAP programmes	96
Impact of CEHAPE	96
Challenges in implementing CEHAPE	97
WHO support to CEHAPE implementation	98
Addressing cross-cutting issues	98
Intersectoral collaboration on health	99
Conclusions of the assessment	103
Annex 1. Countries which responded to WHO’s survey on environment and health policies (June 2009) and survey on CEHAPE (November 2009)	107
Annex 2. List of ENHIS fact sheets	111
Annex 3. Policy survey and policy analysis methods	113
Data collection	113
Data analysis	113
Calculation of scores	114
Annex 4. Contributors	123

ACKNOWLEDGEMENTS

The input of experts providing data and information as well as preparing the analysis used in this report is gratefully acknowledged. The list of contributors is given in Annex 4.

The work was supported by grants obtained by WHO from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The update of the European Environment and Health Information System (EHIS) was partially supported by the Climate Change, Environment and Health Action Plan and Information System (CEHAPIS) project Grant Agreement SPC 2007WHO03 from the European Commission.

Executive Summary

This report describes the progress made by the Member States of the World Health Organization (WHO) European Region in their health and environment situation over the last 20 years. The assessment focuses on the environment and health issues arising from the four regional priority goals of the Children's Environment and Health Action Plan for Europe (CEHAPE), agreed at the Fourth Ministerial Conference on Environment and Health in Budapest in 2004. The indicators selected for the European Environment and Health Information System (ENHIS) are the main tool of the analysis. The status of policies on environment and health is evaluated using the data submitted by 40 Member States responding to the WHO survey on environment and health policies conducted early in 2009, and the responses of 42 countries to the web-based survey on CEHAPE conducted in November 2009.

The analysis of the data on water-related risks to health concluded that population access to improved water sources, sanitation and wastewater treatment has increased over the past two decades in most, but not all, Member States. In many countries in the east of the Region progress is slow: more than 50% of the rural population in 10 countries have no access to improved sources of water, giving rise to important health inequalities. Disease outbreaks related to drinking-water are registered even in the most economically developed countries indicating that unsafe water remains a public health issue throughout the Region. Harmonized surveillance systems for waterborne diseases and outbreaks are still absent in a majority of the countries in the Region, as are systems for monitoring health risks related to bathing water.

European Community legislation on water and health is an important policy driver throughout the Region, including in areas beyond the European Union (EU). The United Nations Economic Commission for Europe (UNECE)/WHO Protocol on Water and Health has become the Region-wide health regulation in the areas of integrated water resource management, a sustainable water supply compliant with WHO's guidelines for drinking-water quality and adequate sanitation for all.

Unintentional injuries are a leading cause of death in young people aged 0–19 years, with road traffic injuries contributing the largest burden followed by injuries occurring in the home and in leisure settings. Inequalities between countries are extreme, with mortality and injury incidence rates differing by an order of magnitude between countries. The substantial overall reduction in traffic-related deaths over the last two decades shows that these injuries and deaths are preventable. Unfortunately, in the last decade this downward trend has halted in countries in the east of the Region, where a small increase in mortality has been recorded, increasing the gap between the rates for the newly independent states and EU countries to over 50% of the EU level.

There are wide variations in the national proportions of overweight and obese children, ranging from 3% to over 30% in 11–15-year-olds. In many countries, the problem appears to be worsening in the recent

years. At the same time, a substantial proportion (40–50% or more) of 11-year-olds in all countries in the Region do not engage in sufficient physical activity; the proportion is even higher among 13- and 15-year-olds.

There is growing evidence that well-designed built environments and public green spaces enhance physical activity patterns and reduce the risk of injuries. Tailored approaches are required for specific groups of citizens to benefit from the full potential of public places and networks to exercise and be physically active, and to be protected from threats to their safety in the urban, transport, home and leisure environments.

The incidence of infant deaths from respiratory disease has been falling in most countries but is still a significant health burden (12% of infant deaths overall), particularly in the eastern part of the Region. From 5% to 25% of children aged 13–14 years suffer from asthma and allergies, indicating that these diseases are an important and increasing cause of childhood illness in the Region. Air pollution, especially inhalable particulate matter (PM₁₀), exacerbates asthma symptoms and recent studies indicate that it can also contribute to the incidence of the disease.

Urban air pollution, especially particulate matter, also causes other significant health problems throughout the Region, reducing the life expectancy of residents of more polluted areas by over one year. After substantial decreases in outdoor air pollution in most of the Region in the 1990s, progress in the last decade has been minimal. Over 92% of the urban population for whom relevant air quality data are available live in cities where the WHO air quality guideline for PM₁₀ is exceeded.

In many countries, over 80% of children are regularly exposed to second-hand tobacco smoke in the home and even more outside the home. Although regulations introducing spaces free of tobacco-smoke, following the principles of the Framework Convention on Tobacco Control, have proved highly efficient in reducing the impacts on health of tobacco, they have yet to be introduced or developed in large parts of the Region.

Dampness and mould are now established as major indoor air quality problems that disproportionately affect the health of disadvantaged populations. More than 20% of households live in houses where dampness and mould are evident. Although approaches to reduce and eliminate these problems from buildings are available, the relevant public policies need to be strengthened. The newly published *Indoor air quality guidelines* should raise awareness of this issue in the Member States.

Policies and action to limit exposure to persistent organic pollutants and heavy metals in food and to eliminate exposure to lead have achieved considerable success within the Region. Lead emissions decreased by 90% between 1990 and 2003, mainly due to the complete switch to unleaded gasoline in most of the Region. This has been reflected in a lower level of lead in children's blood. Leaded petrol is, however, still being used in some countries and exposure remains of health concern in populations living near industrial hot-spots in the east and south-east of the Region. A full assessment of population exposure to heavy metals is difficult owing to the scarcity of bio-monitoring data.

International cooperation on food safety has been efficient, with countries developing coherent standards and regulations and thus ensuring the same level of health protection for a substantial proportion of the European population. Environmental policies on heavy metals do not, however, give much consideration to health in most countries, and certainly not proportional to the risks to health which such metals may create.

Environmental noise is perceived as the most common stressor: a quarter of the population in EU

countries are exposed to noise levels leading to a wide range of health effects. Noise abatement policies in many Member States need to be strengthened to address health problems effectively.

Safety in the occupational environment improved significantly in the 1990s but, in the last decade, the improvement has levelled off in the eastern part of the Region.

Relevant data and information have become significantly more available and accessible over the last decade, to a large extent due to the new requirements for improved monitoring and data exchange between the Member States (resulting from EU legislation or international conventions) and to activities coordinated by the European Environment Agency and WHO. The establishment of ENHIS has provided an important and efficient tool for situation analysis. Nevertheless, data are far from comprehensively available. The lack of relevant monitoring in large parts of the Region restricts the possibility of a comprehensive Region-wide assessment of the situation.

In the case of several old problems, such as outdoor air pollution, many countries have exhausted simple measures to control hazardous emissions and need to turn to more complicated, systemic approaches to bring down population exposure levels further. Local measures are not sufficient, and regional and international action is needed to achieve further progress in reducing pollution. In the eastern part of the Region, air quality management systems have not been adapted to the changing evidence base and identification of inhalable particles as a prominent and widespread health risk.

The scope of public policies varies significantly as regards environmental health issues. While traditional hazards, such as those related to drinking- and bathing water, are subject to a broad range of activities and include substantial involvement by health systems, issues related to indoor air quality, the prevention of unintentional injuries or promotion of physical activity are some of the topics for which policies are less developed.

The regulatory basis for action has improved significantly in recent years. International regulations, such as new directives on air quality or on the management of chemicals, have been introduced in the EU and are also followed in many non-EU countries in the Region. In non-EU countries, more than half of the regulatory acts related to the environment and health have been created, revised or updated in the last five years. For example, the UNECE/WHO Protocol on Water and Health supports health-related regulations in the areas of integrated water resource management and sustainable water supply throughout the Region; the Framework Convention on Tobacco Control promotes new action to reduce exposure to second-hand tobacco smoke; and the Strategic Approach to International Chemicals Management provides a new framework for chemical safety.

There are wide variations in the inclusion of population health between policies addressing different topics. Health is well considered in policy development in most parts of the Region in relation to drinking-water, outdoor air quality or food safety, but there are substantial differences between various parts of the Region in relation to policies on bathing water. Explicit consideration of health in the development of policies is still rare in relation to unintentional injuries, physical activity or heavy metals. However, where issues such as unintentional injuries, physical activity or exposure to second-hand tobacco smoke are concerned, health systems are involved in implementing policy even though health is not explicitly considered during the formulation of policy.

The extent, methods of implementation and enforcement of policies related to the quality of drinking- and bathing water, unintentional injuries, physical activity, outdoor air quality, second-hand tobacco smoking or environmental noise vary widely between groupings of countries. In general, penalties for infringement of regulations are more often used in the east of the Region and action plans to reduce the risks more common in the west.

There is less accountability for health in policies on dampness and mould, heavy metals and noise than on other topics, as well as, in some groupings of countries, for unintentional injuries and physical activity. The level of accountability corresponds to the existence and efficiency of health-relevant monitoring systems and use of the available information for policy evaluation. The lack of reliable monitoring systems generating data on widespread environmental health issues, such as outbreaks of waterborne diseases or inhalable particulate matter, remains a problem in many countries of the Region.

Most countries involved their health systems in implementing policies regarding drinking-water, second-hand tobacco smoke and food safety. Such involvement varied significantly between countries for most other topics; this could, to some extent, be a reflection of differing distributions of responsibilities within the public sector. In some cases, however, less involvement by health systems could be due to inadequate resources and capacity in the health system.

In most countries, little attention is paid to the special needs of vulnerable groups in relation to all the topics considered except unintentional injuries or physical activity. Social inequalities or gender issues are relatively rarely addressed in those policy- and decision-making processes of relevance to children's environment and health. This may increase social inequalities in exposure and related health risks.

Despite overall progress in the collection and use of environment and health data, the availability of information to prioritize, monitor and assess the effectiveness of action is unequal across the Region. This hampers the effective use of resources and militates against sustainable action. The information available to the public is limited, lessening their involvement in risk reduction and their support for policies addressing the environmental determinants of health. The scarcity of data reduces the possibility of carrying out risk analyses, setting priorities for action and monitoring their implementation.

Two thirds (28) of the 42 countries that responded to the CEHAPE survey have developed, and a further 10 are developing, a national or sub-national children's environment and health action plan, mainly as a component of other national policies or of the national environment and health action plans. In most countries, the European policy framework (CEHAPE) has positively influenced interventions to reduce the environmental risks to children's health, the development of monitoring and information systems in environment and health, public information and awareness and intersectoral collaboration. In a quarter of the responding countries, however, the European plan has failed to mobilize human and/or financial resources for environment and health issues, or to stimulate capacity-building or collaboration with other countries that share similar problems.

The availability of skilled human resources, supported by a stable institutional base, is a key factor in limiting the ability to plan and implement action to improve the environmental health situation, especially in the eastern parts of the Region. When intersectoral collaboration is inadequate and ineffective, the capacity to address old problems and identify emerging ones is further restricted. The lack of a sustainable mechanism to ensure such collaboration, in particular the absence of dedicated budgets or a too informal character, make both the collaboration and the pooling of resources difficult.

Résumé

Ce rapport rend compte des progrès accomplis par les États membres de la Région européenne de l'Organisation mondiale de la santé (OMS) en ce qui concerne leur situation sanitaire et environnementale au cours de ces 20 dernières années. L'évaluation aborde les questions d'environnement et de santé liées aux quatre objectifs prioritaires régionaux du Plan d'action pour l'environnement et la santé des enfants en Europe (CEHAPE), convenu à la Quatrième Conférence ministérielle sur l'environnement et la santé organisée à Budapest en 2004. Les indicateurs sélectionnés pour le Système européen d'information sur l'environnement et la santé (ENHIS) constituent le principal outil de l'analyse. La situation concernant les politiques relatives à l'environnement et à la santé est évaluée à l'aide des données fournies par 40 États membres ayant répondu à l'enquête de l'OMS sur ce sujet et réalisée au début de 2009, et des réponses apportées par 42 pays dans le cadre d'une enquête en ligne sur le CEHAPE et réalisée en novembre 2009.

Selon les conclusions de l'analyse des données sur les risques sanitaires d'origine hydrique, l'accès des populations à des sources améliorées d'approvisionnement en eau, à l'assainissement et au traitement des eaux usées a augmenté au cours des 20 dernières années dans la plupart, mais pas dans tous les États membres. Les progrès sont lents dans beaucoup de pays de la partie orientale de la Région : plus de 50 % de la population rurale de 10 pays n'ont pas accès à des sources améliorées d'approvisionnement en eau, une situation qui donne lieu à d'importantes inégalités de santé. Les données sur les flambées de maladies liées à l'eau de boisson indiquent que l'eau insalubre reste un problème de santé publique dans toute la Région, y compris dans les pays les plus développés sur le plan économique. Des systèmes harmonisés de surveillance des maladies et des flambées d'origine hydrique font encore défaut dans la majorité des pays de la Région, ainsi d'ailleurs que les systèmes de surveillance des risques sanitaires liés à l'eau de baignade.

La législation européenne relative à l'eau et à la santé motive dans une large mesure l'élaboration de politiques dans la Région, et au-delà de l'Union européenne (UE). Dans la Région européenne, le Protocole sur l'eau et la santé de la Commission économique pour l'Europe des Nations Unies (CEE-ONU) et de l'OMS est devenu l'instrument de réglementation dans les domaines de la gestion intégrée des ressources hydriques, de l'approvisionnement en eau durable conforme aux *Directives de qualité pour l'eau de boisson de l'OMS* et de l'assainissement adéquat pour tous.

Les traumatismes non intentionnels sont la principale cause de décès chez les enfants et les jeunes âgés de 0 à 19 ans, les traumatismes dus aux accidents de la route représentant la plus grande charge de mortalité, suivis par les traumatismes dus à des accidents domestiques ou provoqués lors d'activités de loisirs. Les inégalités entre les pays sont énormes, et les taux d'incidence de la mortalité et des traumatismes varient amplement entre les pays. La forte diminution générale du nombre de morts sur les routes au cours de ces vingt dernières années est la preuve que ces traumatismes et ces décès sont évitables. Malheureusement,

au cours de la dernière décennie, cette tendance à la baisse ne s'est pas vérifiée dans plusieurs pays de la partie orientale de la Région. Une faible augmentation de la mortalité y a d'ailleurs été enregistrée, ce qui a creusé l'écart entre les taux des nouveaux États indépendants (NEI) de l'ex-Union soviétique et les taux des pays de l'UE à plus de 50 % par rapport au niveau de l'UE.

Il existe d'importantes variations dans les pourcentages nationaux d'enfants atteints de surpoids et d'obésité, allant de 3 % à plus de 30 % chez les 11 à 15 ans. Dans beaucoup de pays, le problème semble empirer ces dernières années. En même temps, dans tous les pays de la Région, un pourcentage important (40-50 % ou plus) des enfants âgés de 11 ans ne pratique pas suffisamment d'activité physique, ce pourcentage étant encore plus élevé chez les enfants âgés de 13 et 15 ans.

Il est de plus en plus apparent que l'aménagement d'environnements bâtis et d'espaces verts publics bien conçus favorise l'activité physique et réduit le risque de traumatismes. Des approches personnalisées doivent être adoptées pour des groupes spécifiques de citoyens afin qu'ils puissent pleinement profiter des réseaux et des espaces publics pour faire de l'exercice et être physiquement actifs, et pour se protéger des risques sécuritaires en ville, dans les transports, à la maison et dans les lieux de loisirs.

Si l'incidence de la mortalité infantile imputable aux maladies respiratoires est en recul dans la plupart des pays, elle constitue toujours une importante charge sanitaire (12 % de la mortalité infantile générale), en particulier dans la partie orientale de la Région. Cinq à 25 % des enfants âgés de 13 à 14 ans souffrent d'asthme et d'allergies, ces maladies constituant par conséquent une cause majeure et croissante de maladies infantiles dans la Région. La pollution de l'air, en particulier les matières particulaires inhalables (PM₁₀), exacerbe les symptômes de l'asthme et, selon des études récentes, elle peut aussi contribuer à l'incidence de la maladie.

La pollution de l'air en ville, en particulier les matières particulaires, est également à l'origine d'autres problèmes sanitaires importants de part et d'autre de la Région, et réduit de plus d'un an l'espérance de vie des populations résidant dans les zones les plus polluées. Après plusieurs diminutions substantielles de la pollution de l'air extérieur dans une bonne partie de la Région dans les années 1990, des progrès minimaux ont été relevés au cours de cette dernière décennie. En effet, plus de 92 % de la population urbaine pour laquelle des données relatives à la qualité de l'air sont disponibles vivent dans des villes où les concentrations de PM₁₀ dépassent celles prescrites dans les valeurs guides de l'OMS pour la qualité de l'air.

Dans beaucoup de pays, plus de 80 % des enfants sont régulièrement exposés au tabagisme passif à la maison, et ce pourcentage est encore plus élevé si l'on considère l'exposition à la fumée à l'extérieur de chez eux. Bien que les réglementations visant à garantir des espaces sans fumée, conformément aux principes énoncés dans la Convention-cadre pour la lutte antitabac, se soient avérées particulièrement efficaces dans la lutte contre les effets sanitaires du tabagisme, elles doivent encore être appliquées ou élaborées dans de nombreuses régions d'Europe.

L'humidité et les moisissures sont maintenant considérées comme d'importants problèmes de qualité de l'air intérieur qui affectent de manière disproportionnée la santé des populations défavorisées. Plus de 20 % des ménages vivent dans des habitations touchées par l'humidité et les moisissures. Malgré l'existence de stratégies de lutte et d'éradication, les politiques des pouvoirs publics y afférentes doivent être renforcées. Les toutes nouvelles *Valeurs guides de l'OMS pour la qualité de l'air intérieur* doivent sensibiliser davantage les États membres à ce problème.

Les politiques et les mesures visant à limiter l'exposition aux polluants organiques persistants et aux métaux lourds dans l'alimentation et à éliminer l'exposition au plomb ont donné des résultats

particulièrement probants dans la Région. En effet, les émissions de plomb ont été réduites de 90 % entre 1990 et 2003, notamment grâce à l'adoption généralisée de l'essence sans plomb dans une bonne partie de la Région. Ainsi a-t-on diminué la plombémie chez l'enfant. Cependant, l'essence au plomb est encore utilisée dans certains pays, et l'exposition suscite toujours des inquiétudes sanitaires chez les populations vivant à proximité des zones industrielles de l'est et du sud-est de la Région. Une évaluation complète de l'exposition des populations aux métaux lourds est difficile de par le manque de données relatives à la biosurveillance.

La coopération internationale a été efficace dans le domaine de la sécurité sanitaire des aliments. Les pays ont élaboré des normes et des réglementations cohérentes assurant le même niveau de protection sanitaire à une bonne partie de la population européenne. Cependant, les politiques environnementales relatives aux métaux lourds ne portent pas beaucoup d'attention aux aspects sanitaires dans la plupart des pays, et cette attention n'est en tout cas pas proportionnelle aux risques sanitaires suscités par ces métaux.

Le bruit ambiant est perçu comme le facteur de stress le plus fréquent : un quart de la population des pays de l'UE est exposé à des niveaux sonores entraînant tout un ensemble d'effets sanitaires. Les politiques antibruit de la plupart des États membres doivent être renforcées afin de s'attaquer de manière efficace aux problèmes de santé.

Si la sécurité s'est sensiblement améliorée sur le lieu de travail dans les années 1990, la situation à cet égard a cessé de progresser dans la partie orientale de la Région au cours de la dernière décennie.

Des données et des informations pertinentes sont devenues beaucoup plus disponibles et accessibles au cours des dix dernières années, dans une large mesure grâce aux nouvelles exigences en matière d'amélioration de la surveillance et de l'échange de données entre les États membres (découlant de la législation de l'UE ou de conventions internationales) et aux activités coordonnées par l'Agence européenne de l'environnement et l'OMS. La mise en place de l'ENHIS permet de disposer d'un outil à la fois important et efficace pour analyser la situation. Néanmoins, les données sont loin d'être entièrement disponibles. Le manque d'activités de suivi pertinentes dans une bonne partie de la Région rend difficile toute évaluation globale de la situation au niveau européen.

En ce qui concerne certains problèmes traditionnels comme la pollution de l'air extérieur, beaucoup de pays ont épuisé les mesures simples de lutte contre les émissions dangereuses, et doivent se tourner vers des approches plus complexes et systémiques dans le but de diminuer davantage le niveau d'exposition des populations. Les interventions locales ne suffisent pas, et une action régionale et internationale est nécessaire pour accomplir de nouveaux progrès en matière de réduction de la pollution. Dans la partie orientale de la Région, les systèmes de gestion de la qualité de l'air ne prennent pas en compte les nouvelles bases factuelles, ni le risque sanitaire important et généralisé des particules inhalables.

Le contenu des politiques varie sensiblement en ce qui concerne les questions liées à l'hygiène de l'environnement. Si les risques traditionnels, comme ceux liés à l'eau de boisson ou de baignade, donnent lieu à tout un ensemble d'actions, dont un engagement substantiel des systèmes de santé, les questions relatives à la qualité de l'air intérieur, la prévention des traumatismes non intentionnels ou la promotion de l'activité physique sont quelques-uns des thèmes moins repris dans les politiques.

La base réglementaire des interventions s'est largement améliorée ces dernières années. Des réglementations internationales, telles que les nouvelles directives sur la qualité de l'air et la gestion des produits chimiques, ont été appliquées dans l'UE, et sont même respectées par beaucoup de pays de la Région n'ayant pas adhéré à l'UE. Dans les pays non membres de l'UE, plus de la moitié des actes réglementaires relatifs à

l'environnement et à la santé ont été élaborés, révisés ou mis à jour au cours de ces cinq dernières années. Par exemple, le Protocole sur l'eau et la santé de la CEE-ONU et de l'OMS soutient les réglementations sanitaires dans les domaines de la gestion intégrée des ressources hydriques et de l'approvisionnement durable en eau dans l'ensemble de la Région ; la Convention-cadre pour la lutte antitabac préconise la prise de nouvelles mesures afin de réduire l'exposition au tabagisme passif ; et l'Approche stratégique de la gestion internationale des produits chimiques fournit un nouveau cadre à la sécurité chimique.

Il existe de nombreuses différences entre les politiques élaborées dans divers domaines en ce qui concerne la prise en considération de la santé des populations. En effet, dans la majeure partie de la Région, la santé entre largement en ligne de compte dans les politiques relatives à l'eau potable, à la qualité de l'air extérieur ou à la sécurité sanitaire des aliments. Il existe, en revanche, d'importantes disparités de part et d'autre de la Région eu égard aux politiques sur l'eau de baignade. La référence explicite aux questions de santé est encore souvent absente du processus d'élaboration des politiques relatives aux traumatismes non intentionnels, à l'activité physique et aux métaux lourds. Cependant, lorsque des problèmes comme les traumatismes non intentionnels, l'activité physique ou l'exposition au tabagisme passif sont en cause, les systèmes de santé participent à la mise en application des politiques et ce, même si la santé n'a pas été clairement prise en compte lors de la formulation de la politique en question.

La portée, les méthodes d'application et l'exécution des politiques relatives à la qualité de l'eau de boisson et de baignade, aux traumatismes non intentionnels, à l'activité physique, à la qualité de l'air extérieur, au tabagisme passif ou au bruit ambiant varient amplement entre les groupes de pays. En général, les sanctions en cas de non-respect des réglementations sont plus fréquentes dans la partie orientale de la Région, et les plans d'action visant à réduire les risques sont plus courants à l'ouest.

La responsabilité en matière de santé est moindre dans les politiques relatives à l'humidité et aux moisissures, aux métaux lourds et aux nuisances sonores que dans d'autres politiques. Il en est de même dans certains groupes de pays en ce qui concerne les traumatismes non intentionnels et l'activité physique. Le niveau de responsabilité correspond à l'existence et à l'efficacité des systèmes de surveillance sanitaire et à l'utilisation de l'information disponible pour évaluer les politiques. Le manque de systèmes de surveillance fiables générant des données sur d'importantes questions d'hygiène de l'environnement, telles que les flambées de maladies d'origine hydrique ou les matières particulaires inhalables, reste un défi dans beaucoup de pays de la Région.

La majorité des pays ont impliqué leur système de santé dans la mise en application des politiques relatives à l'eau de boisson, au tabagisme passif et à la sécurité sanitaire des aliments. Cette participation varie amplement d'un pays à l'autre dans la plupart des autres domaines, une situation qui, dans une certaine mesure, peut témoigner d'une répartition différente des responsabilités au sein du secteur public. Cependant, la participation limitée des systèmes de santé peut être parfois due à l'inadéquation des ressources et des capacités du système même.

Dans la plupart des pays, peu d'attention est portée aux besoins spéciaux des groupes vulnérables eu égard à tous les thèmes concernés, à l'exception cependant des traumatismes non intentionnels ou de l'activité physique. Les inégalités sociales ou les questions sexospécifiques sont relativement peu abordées dans ces processus politiques et décisionnels pertinents pour l'environnement et la santé des enfants, ce qui peut aggraver les inégalités sociales en matière d'exposition et de risques sanitaires connexes.

Malgré les progrès généralement observés en ce qui concerne la collecte et l'utilisation de données environnementales et sanitaires, la disponibilité des informations en vue de prioriser, de contrôler et d'évaluer l'efficacité des interventions varie de part et d'autre de la Région. Ceci empêche l'utilisation

efficace des ressources et milite contre la mise en œuvre d'actions durables. Comme l'information disponible au public est limitée, la participation de ce dernier aux efforts de réduction des risques est par conséquent moins importante, ainsi d'ailleurs que son soutien aux politiques agissant sur les déterminants environnementaux de la santé. À cause du manque de données, il devient moins possible de réaliser des analyses de risques, de définir les actions prioritaires et d'effectuer le suivi de leur mise en œuvre.

Deux tiers (28) des 42 pays ayant répondu à l'enquête sur le CEHAPE ont formulé (et dix autres sont en train de le faire) un plan d'action national ou sous-national pour l'environnement et la santé des enfants, notamment dans le cadre d'autres politiques nationales ou des plans d'action nationaux pour l'environnement et la santé. Dans la plupart des pays, la politique-cadre européenne (CEHAPE) a influencé de manière positive les interventions visant à réduire les risques environnementaux pour la santé des enfants, l'élaboration de systèmes de surveillance et d'information en matière d'environnement et de santé, l'information et la sensibilisation du public, ainsi que la collaboration intersectorielle. Cependant, dans un quart des pays répondants, le plan européen n'a pu mobiliser les ressources humaines et/ou financières pour les questions d'ordre environnemental et sanitaire, ou stimuler le renforcement des capacités ou la collaboration avec d'autres pays partageant les mêmes problèmes.

La disponibilité de ressources humaines qualifiées, soutenues par une base institutionnelle stable, est un facteur essentiel, et toute carence à cet égard limite la capacité de planifier et de mettre en œuvre des interventions en vue d'améliorer la situation en matière d'hygiène de l'environnement, notamment dans la partie orientale de la Région. Si la collaboration intersectorielle est inadéquate et inefficace, il devient encore plus difficile de résoudre les vieux problèmes et de déterminer les nouveaux défis. L'absence de mécanisme durable assurant une telle collaboration, en particulier lorsqu'aucun budget spécifique n'est affecté ou lorsque le processus est trop informel, complique la collaboration et la mise en commun des ressources.

Kurzfassung

Der vorliegende Bericht befasst sich mit den Fortschritten, die die Mitgliedstaaten der Europäischen Region der Weltgesundheitsorganisation (WHO) in den vergangenen 20 Jahren auf dem Gebiet von Umwelt und Gesundheit erzielt haben. Die darin vorgenommene Analyse orientiert sich primär an den Sachfragen aus dem Bereich Umwelt und Gesundheit, die aus den vier vorrangigen Zielen der Region aus dem Aktionsplan zur Verbesserung von Gesundheit und Umwelt der Kinder in der Europäischen Region der WHO (CEHAPE) entlehnt sind. Dieser wurde 2004 auf der Vierten Ministerkonferenz Umwelt und Gesundheit in Budapest angenommen. Als wichtigstes Instrument in dieser Analyse dienen die für das Europäische Umwelt- und Gesundheitssystem (ENHIS) ausgewählten Indikatoren. Die Evaluation der Umsetzung der Handlungskonzepte im Bereich Umwelt und Gesundheit erfolgt anhand der von 40 Mitgliedstaaten Anfang 2009 im Rahmen des Fragebogens der WHO über Umwelt- und Gesundheitspolitik übermittelten Daten sowie anhand der Antworten von 42 Ländern auf die webbasierte Befragung in Bezug auf den Aktionsplan CEHAPE im November 2009.

Die Analyse der Daten über wasserbedingte Gesundheitsrisiken kam zu dem Ergebnis, dass in den vergangenen beiden Jahrzehnten in den meisten, jedoch nicht allen Mitgliedstaaten ein größerer Teil der Bevölkerung Zugang zu einer geregelten Wasserver- und Abwasserentsorgung und -behandlung erhalten hat. In vielen Ländern im östlichen Teil der Region sind jedoch nur langsame Fortschritte zu verzeichnen. So verfügen in zehn Ländern mehr als 50% der ländlichen Bevölkerung über keinen Zugang zu einer geregelten Wasserversorgung, was mit einer erheblichen gesundheitlichen Benachteiligung verbunden ist. Die Daten über durch mangelnde Trinkwasserqualität bedingte Krankheitsausbrüche deuten darauf hin, dass unsicheres Wasser in der gesamten Region, selbst in den wirtschaftlich entwickeltsten Ländern, nach wie vor eine Belastung für die öffentliche Gesundheit darstellt. Harmonisierte Überwachungssysteme für wasserbedingte Krankheiten und Ausbrüche gibt es in der Mehrzahl der Länder noch nicht, ebenso wenig Systeme für die Überwachung von Gesundheitsrisiken in Badegewässern.

Die Rechtsvorschriften der Europäischen Gemeinschaft im Bereich Wasser und Gesundheit sind eine wichtige politische Triebkraft in der gesamten Region, also auch außerhalb der Europäischen Union. Das von der Wirtschaftskommission der Vereinten Nationen für Europa (UNECE) und der WHO gemeinsam ausgearbeitete Protokoll über Wasser und Gesundheit ist für die gesamte Region zu einer gesundheitlichen Vorschrift in Bezug auf die sektorübergreifende Wasserbewirtschaftung, eine nachhaltige Wasserversorgung gemäß den WHO-Leitlinien für Trinkwassergüte und eine bedarfsgerechte Abwasserbeseitigung für alle geworden.

Unfallverletzungen sind in der Altersgruppe unter 20 Jahren eine führende Todesursache, wobei an erster Stelle Straßenverkehrsverletzungen stehen, gefolgt von Verletzungen im häuslichen Umfeld und im Freizeitbereich. Die Ungleichheiten zwischen den Ländern sind ausgesprochen stark ausgeprägt; oft

liegen die Inzidenzraten für Mortalität und Verletzungen zwischen Ländern um eine Größenordnung auseinander. Die erhebliche Verringerung der Gesamtzahl verkehrsbedingter Todesfälle in den letzten beiden Jahrzehnten zeigt, dass diese Verletzungen und Todesfälle vermeidbar sind. Leider wurde dieser rückläufige Trend in den letzten zehn Jahren im östlichen Teil der Region unterbrochen und ein leichter Anstieg der Mortalität verzeichnet, so dass sich der Abstand zwischen den Raten für die neuen unabhängigen Staaten der ehemaligen Sowjetunion (NUS) und den EU-Staaten auf über 50% des EU-Niveaus erhöht hat.

Es gibt deutliche Unterschiede zwischen den Ländern hinsichtlich des Anteils der übergewichtigen und adipösen Kinder, der in der Altersgruppe von 11 bis 15 Jahren zwischen 3% und über 30% liegt. In vielen Ländern hat sich das Problem in den letzten Jahren offenbar verschärft. Gleichzeitig hat in sämtlichen Ländern der Region ein erheblicher Anteil (40–50% oder mehr) der 11-Jährigen nicht ausreichend Bewegung; in der Altersgruppe von 13 bis 15 Jahren liegt der Anteil sogar noch höher.

Es gibt immer mehr Hinweise darauf, dass sinnvoll konzipierte bauliche Umgebungen und öffentliche Grünflächen zu einer Verbesserung des Bewegungsverhaltens und einer Verringerung des Verletzungsrisikos führen. Damit bestimmte Gruppen von Bürgern das Potenzial öffentlicher Orte und Netzwerke optimal für körperliche und sportliche Betätigung nutzen können und in ihrer städtischen und häuslichen Umgebung sowie in Verkehr und Freizeit vor Sicherheitsbedrohungen geschützt sind, werden bedarfsgerechte Konzepte benötigt.

Die Inzidenz von Säuglingssterbefällen aufgrund von Atemwegserkrankungen ist in den meisten Ländern gesunken, stellt aber immer noch eine erhebliche Belastung für die öffentliche Gesundheit dar (insgesamt 12% aller Säuglingssterbefälle); besonders stark betroffen ist der östliche Teil der Region. Zwischen 5% und 25% der Kinder zwischen 13 und 14 Jahren leiden an Asthma und Allergien, was diese Krankheiten zu einer zunehmend bedeutenden Krankheitsursache für die Kinder in der Region macht. Luftverschmutzung, insbesondere durch inhalierbaren Schwebstaub (PM₁₀), wirkt sich nachteilig auf Asthmasymptome aus, und neuere Studien deuten darauf hin, dass sie auch zu einer Erhöhung der Inzidenz der Krankheit beitragen.

Luftverschmutzung in städtischen Gebieten, insbesondere durch Schwebstaub, verursacht auch andere signifikante Gesundheitsprobleme in der gesamten Region und hat eine Verringerung der Lebenserwartung der Bewohner stärker belasteter Gegenden um mehr als ein Jahr zur Folge. Nach einer deutlichen Abnahme der Verschmutzung der Außenluft in weiten Teilen der Region in den 1990er Jahren waren im vergangenen Jahrzehnt nur geringe Fortschritte zu verzeichnen. Über 92% der städtischen Bevölkerung, für die verwendbare Luftgütedaten vorliegen, leben in Städten, in denen der Richtwert der WHO für PM₁₀ überschritten wird.

In vielen Ländern sind über 80% der Kinder zuhause regelmäßig – und außer Hauses in noch höherem Maße – Passivrauch ausgesetzt. Auch wenn die Bestimmungen zur Schaffung rauchfreier Räume gemäß den Grundsätzen des Rahmenübereinkommens zur Eindämmung des Tabakgebrauchs sich bei der Verringerung der gesundheitlichen Folgen des Tabakkonsums als äußerst effizient erwiesen haben, müssen sie in weiten Teilen der Region erst noch eingeführt oder entwickelt werden.

Feuchtigkeit und Schimmel sind heute als wesentliche Probleme in Bezug auf die Raumluftgüte anerkannt, von deren gesundheitlichen Folgen benachteiligte Bevölkerungsgruppen unverhältnismäßig häufig betroffen sind. Mehr als 20% aller Haushalte leben in Häusern, in denen sich Feuchtigkeit und Schimmel deutlich bemerkbar machen. Auch wenn Maßnahmen zur Reduzierung bzw. Beseitigung dieser Probleme aus Gebäuden bereit stehen, so müssen doch die einschlägigen politischen Handlungskonzepte gestärkt werden. Die vor kurzem veröffentlichten WHO-Leitlinien zur Raumluftqualität sollten in den Mitgliedstaaten das Bewusstsein für diese Problematik schärfen.

Konzepte und Maßnahmen zur Begrenzung der Exposition gegenüber persistenten organischen Schadstoffen und Schwermetallen in Nahrungsmitteln und zur Beseitigung von Bleibelastungen haben in der Region beachtliche Erfolge erzielt. So konnten die Bleiemissionen zwischen 1990 und 2003 um 90% gesenkt werden – hauptsächlich aufgrund der vollständigen Umstellung auf bleifreies Benzin in weiten Teilen der Region. Die Folgen sind an niedrigeren Bleiwerten im Blut von Kindern erkennbar. Allerdings wird in einigen Ländern immer noch verbleites Benzin verwendet, und im Osten und Südosten der Region ist die Exposition der Bevölkerung in der Nähe von Industriezentren weiterhin besorgniserregend hoch. Eine umfassende Bewertung der Exposition der Bevölkerung gegenüber Schwermetallen ist aufgrund der mangelnden Verfügbarkeit von Biomonitoring-Daten schwierig.

Die internationale Zusammenarbeit auf dem Gebiet der Lebensmittelsicherheit ist heute effizient, und die Länder entwickeln zusammenhängende Normen und Vorschriften, so dass ein Großteil der Bevölkerung der Europäischen Region über ein vergleichbares Maß an Gesundheitsschutz verfügt. Bei umweltpolitischen Maßnahmen gegen Schwermetalle spielen in den meisten Ländern gesundheitliche Aspekte nur eine geringe Rolle, vor allem wenn man sich die beträchtlichen Gesundheitsrisiken vergegenwärtigt, die von Schwermetallen ausgehen.

Umgebungsärm wird als der am weitesten verbreitete Stressfaktor angesehen. Ein Viertel der Bevölkerung in den EU-Staaten ist einer Lärmbelastung ausgesetzt, die ein breites Spektrum an Gesundheitsfolgen nach sich ziehen kann. In vielen Mitgliedstaaten müssen die Lärmschutzkonzepte mit dem Ziel einer wirksamen Bekämpfung der bestehenden Gesundheitsprobleme verstärkt werden.

Die Sicherheit am Arbeitsplatz hat sich in den 1990er Jahren signifikant verbessert, doch war im vergangenen Jahrzehnt im östlichen Teil der Region auf diesem Gebiet eher eine Stagnation zu verzeichnen.

Die Verfügbarkeit und Zugänglichkeit relevanter Daten und Informationen hat sich im vergangenen Jahrzehnt deutlich verbessert, was vor allem auf die neuen Anforderungen an Überwachung und Datenaustausch zwischen den Mitgliedstaaten (aufgrund von Rechtsvorschriften der EU oder internationalen Übereinkommen) und auf von der Europäischen Umweltagentur und der WHO koordinierte Maßnahmen zurückzuführen ist. Mit der Einführung des ENHIS wurde ein bedeutendes und effizientes Instrument für die Situationsanalyse geschaffen. Dennoch kann von einer umfassenden Verfügbarkeit von Daten nicht die Rede sein. Das Fehlen geeigneter Überwachungsmaßnahmen in weiten Teilen der Region schränkt die Möglichkeiten für eine umfassende regionsweite Bestandsaufnahme der Situation ein.

Zur Bekämpfung einiger lange verbreiteter Probleme wie der Verschmutzung der Außenluft haben viele Länder die einfachen Maßnahmen zur Bekämpfung gefährlicher Emissionen inzwischen ausgeschöpft und müssen nun für eine weitere Senkung der Exposition der Bevölkerung zu komplizierteren, systembezogenen Verfahren greifen. Für weitere Fortschritte bei der Senkung von Emissionen sind Maßnahmen auf lokaler Ebene nicht ausreichend; vielmehr werden regional und international angelegte Maßnahmen benötigt. Im östlichen Teil der Region wurden die Systeme zur Reinhaltung der Luft nicht im Lichte der sich verändernden Evidenzbasis und der Identifizierung von inhalierbaren Partikeln als wesentlichem und weit verbreitetem Gesundheitsrisiko angepasst.

Die politischen Handlungskonzepte in Bezug auf Fragen des gesundheitsbezogenen Umweltschutzes sind in ihrem Umfang sehr uneinheitlich. Während die Auseinandersetzung mit traditionellen Gesundheitsgefahren, etwa aufgrund mangelnder Qualität von Trinkwasser und Badegewässern, mit einem breiten Spektrum an Maßnahmen und unter erheblicher Beteiligung der Gesundheitssysteme erfolgt, liegen für Themenbereiche wie Raumluftgüte, Prävention von Unfallverletzungen oder Bewegungsförderung weit weniger ausgearbeitete Konzepte vor.

Die regulatorische Handlungsgrundlage hat sich in den letzten Jahren beträchtlich verbessert.

Internationale Vorschriften wie die neuen Richtlinien für Luftgüte oder für das Chemikalienmanagement stammen von der EU, werden aber auch von zahlreichen Mitgliedstaaten der Europäischen Region außerhalb der EU eingehalten. In Ländern, die nicht der EU angehören, wurden in den letzten fünf Jahren mehr als die Hälfte der Rechtsakte aus dem Bereich Umwelt und Gesundheit eingeführt, überarbeitet oder aktualisiert. So dient etwa das von UNECE und WHO ausgearbeitete Protokoll über Wasser und Gesundheit als Grundlage für gesundheitsbezogene Vorschriften auf dem Gebiet der sektorübergreifenden Wasserbewirtschaftung und der nachhaltigen Wasserversorgung in der gesamten Region. Das Rahmenübereinkommen zur Eindämmung des Tabakgebrauchs befürwortet neue Maßnahmen zur Verringerung der Belastung durch Passivrauch. Das Strategische Konzept für ein internationales Chemikalienmanagement bildet einen neuen Rahmen für die Chemikaliensicherheit.

Aspekte der Bevölkerungsgesundheit werden je nach Themenbereich in sehr unterschiedlichem Maße in die Handlungskonzepte einbezogen. In den meisten Teilen der Region werden bei der Ausarbeitung von Vorschriften für Trinkwasser, Luftgüte oder Lebensmittelsicherheit gesundheitliche Belange eingehend berücksichtigt, während es in Bezug auf Vorschriften für Badegewässer deutliche Unterschiede zwischen den verschiedenen Teilen der Region gibt. Bei Vorschriften über Unfallverletzungen, Bewegungsförderung und Schwermetalle ist eine ausdrückliche Berücksichtigung gesundheitlicher Aspekte in der Politikgestaltung bisher noch selten. Jedoch sind die Gesundheitssysteme bei Themenfeldern wie Unfallverletzungen, Bewegungsförderung oder Passivrauch auch dort an der Politikumsetzung beteiligt, wo gesundheitliche Aspekte in der Politikgestaltung nicht ausdrücklich berücksichtigt wurden.

In Bezug auf Ausmaß, Methoden der Umsetzung und Vollzug von politischen Maßnahmen in den Bereichen Trinkwasser und Badegewässer, Unfallverletzungen, Bewegungsförderung, Qualität der Außenluft, Passivrauch und Umgebungslärm gibt es beträchtliche Unterschiede zwischen verschiedenen Ländergruppen. Generell werden im östlichen Teil der Region häufiger Strafen für Verstöße gegen Vorschriften verhängt, während im westlichen Teil eher auf Aktionspläne zur Risikominderung gesetzt wird.

Bei Konzepten gegen Feuchtigkeit und Schimmel, Schwermetalle und Lärmbelastung – und in manchen Ländern für Unfallprävention und Bewegungsförderung – ist eine weniger umfangreiche Rechenschaftsablage vorgeschrieben als in anderen Bereichen. Dabei richtet sich der Grad der Rechenschaftspflicht danach, ob effiziente gesundheitsrelevante Überwachungssysteme vorhanden sind und ob die verfügbaren Informationen gezielt zur Konzeptevaluation genutzt werden. Das Fehlen zuverlässiger Überwachungssysteme für die Gewinnung von Daten über weit verbreitete umweltbedingte Gesundheitsprobleme wie Ausbrüche wasserbedingter Krankheiten oder inhalierbaren Schwebstaub ist in vielen Ländern der Region nach wie vor ein Problem.

Die meisten Länder haben ihre Gesundheitssysteme in die Umsetzung von Maßnahmen in Bezug auf Trinkwasser, Passivrauch und Lebensmittelsicherheit einbezogen. Eine solche Einbeziehung erfolgte aber bei den meisten Themen von Land zu Land in sehr unterschiedlicher Form. Dies könnte bis zu einem gewissen Grad auf Unterschiede hinsichtlich der Aufgabenverteilung im öffentlichen Sektor zurückzuführen sein. In einigen Fällen jedoch kann eine geringere Beteiligung der Gesundheitssysteme durch einen Mangel an Ressourcen bzw. Kapazitäten im Gesundheitssystem selbst bedingt sein.

In den meisten Ländern werden die besonderen Bedürfnisse gefährdeter Gruppen in Bezug auf sämtliche der genannten Themen, mit Ausnahme von Unfallprävention oder Bewegungsförderung, nur marginal berücksichtigt. Soziale Ungleichheiten oder geschlechtsbezogene Fragen spielen in den für Umwelt und Gesundheit der Kinder relevanten Entscheidungsprozessen nur relativ selten eine Rolle. Dadurch können sich soziale Ungleichheiten in Bezug auf Umweltexposition und damit verbundene Gesundheitsrisiken erhöhen.

Trotz der insgesamt festzustellenden Fortschritte bei der Erfassung und Verwendung von Daten über Umwelt und Gesundheit ergibt sich hinsichtlich der Verfügbarkeit von Informationen für die Priorisierung, Überwachung und Bewertung der Wirksamkeit von Maßnahmen ein uneinheitliches Bild innerhalb der Region. Dies beeinträchtigt den wirksamen Einsatz mit Ressourcen und erschwert nachhaltiges Handeln. Da der Öffentlichkeit nur begrenzte Informationen zur Verfügung stehen, hat dies negative Auswirkungen auf deren aktive Beteiligung an der Risikominderung sowie auf ihre Unterstützung für Maßnahmen, die an den umweltbedingten Determinanten von Gesundheit ansetzen. Durch den Mangel an Daten werden die Möglichkeiten zur Durchführung von Risikoanalysen, Festlegung von Handlungsprioritäten und Überwachung von deren Umsetzung eingeschränkt.

Zwei Drittel (28) der 42 Länder, die auf den Fragebogen des CEHAPE antworteten, haben einen nationalen oder subnationalen Aktionsplan zur Verbesserung von Gesundheit und Umwelt der Kinder ausgearbeitet, und weitere zehn sind im Begriff, dies zu tun, meist im Rahmen anderer nationaler Politiken oder der nationalen Aktionspläne zur Verbesserung von Gesundheit und Umwelt. In den meisten Ländern hat der europäische Grundsatzrahmen (CEHAPE) die Maßnahmen zur Verringerung der Umweltrisiken für die Gesundheit der Kinder, die Entwicklung von Überwachungs- und Informationssystemen im Bereich Umwelt und Gesundheit, die Unterrichtung und Aufklärung der Öffentlichkeit sowie sektorübergreifende Kooperationen in positiver Weise beeinflusst. In einem Viertel der Länder jedoch gelang es mit dem europäischen Plan nicht, die personellen bzw. finanziellen Ressourcen für Probleme im Bereich Umwelt und Gesundheit zu mobilisieren oder mit anderen Ländern, die ähnlichen Problemen gegenüberstehen, einen Kapazitätsaufbau oder Kooperationen zu initiieren.

Die Verfügbarkeit geeigneter Arbeitskräfte, die von einer stabilen institutionellen Basis getragen werden, ist vor allem im östlichen Teil der Region ein Schlüsselfaktor, der die Fähigkeit zur Planung und Umsetzung von Maßnahmen zur Verbesserung von Umwelt und Gesundheit einschränkt. Wenn eine sektorübergreifende Zusammenarbeit unzureichend und ineffektiv ist, wird dadurch die Fähigkeit zur Auseinandersetzung mit alten und zur Erkennung neuer Probleme noch weiter beeinträchtigt. Das Fehlen eines nachhaltigen Mechanismus zur Gewährleistung einer solchen Zusammenarbeit – und insbesondere das Fehlen zweckgebundener Haushaltsmittel oder ein zu informeller Rahmen – wirken sich auf Kooperation und Bündelung von Ressourcen gleichermaßen erschwerend aus.

Резюме

В данном докладе содержится описание прогресса, достигнутого государствами-членами Всемирной организации здравоохранения (ВОЗ), входящими в Европейский регион ВОЗ, за последние 20 лет в улучшении ситуации в области охраны здоровья и окружающей среды. Главное внимание уделено вопросам окружающей среды и охраны здоровья, вытекающим из четырех региональных приоритетных задач, сформулированных в Европейском плане действий “Окружающая среда и здоровье детей” (ЕОСЗД), который был согласован на Четвертой министерской конференции по окружающей среде и охране здоровья в Будапеште в 2004 г. В качестве главного инструмента при проведении анализа были использованы показатели, отобранные для Европейской информационной системы социально-гигиенического мониторинга (ENHIS). Оценка политики в области окружающей среды и здоровья основывается на данных, которые были представлены сорока государствами-членами, приславшими свои ответы на вопросник ВОЗ в ходе обследования политики в этой области в начале 2009 г., а также на основании ответов сорока двух стран, полученных в ходе обследования ЕОСЗД в ноябре 2009 г. на базе Интернет-технологии.

На основе анализа данных о рисках для здоровья, связанных с водой, сделан вывод о том, что в последние 20 лет доступ населения к улучшенным системам водоснабжения, канализации и очистки сточных вод был расширен в большинстве, но не во всех государствах-членах. Во многих странах восточной части Региона наблюдается лишь медленный прогресс в этой области. Так, например, в 10 странах свыше 50% сельского населения не имеют доступа к доброкачественному водоснабжению, что приводит к значительным неравенствам в отношении здоровья. Данные о вспышках заболеваний, связанных с питьевой водой, показывают, что во всех странах Региона, включая и наиболее развитые в экономическом отношении страны, небезопасная питьевая вода продолжает оказывать неблагоприятное воздействие на здоровье населения. В большинстве стран Региона все еще не имеется ни стандартизированных систем эпиднадзора за заболеваниями и вспышками заболеваний, связанных с водой, ни системы мониторинга рисков для здоровья, обусловленных качеством воды для купания.

Одним из важных факторов, определяющих политику во всем Регионе, включая страны, не входящие в Европейский союз (ЕС), является законодательство Европейского сообщества по воде и охране здоровья. Нормативным документом в области здравоохранения для всего Региона, регламентирующим комплексное управление водохозяйственной деятельностью, устойчивое водоснабжение, соответствующее требованиям “Руководства по контролю качества питьевой воды, разработанного ВОЗ”, и адекватные санитарно-профилактические мероприятия для всех, является принятый Европейской экономической комиссией Организации Объединенных Наций (ЕЭК ООН) и ВОЗ Протокол по проблемам воды и здоровья.

Одной из ведущих причин смерти среди молодых людей в возрасте от 0 до 19 лет является непреднамеренный травматизм, а наибольшее бремя в этой категории причин исходит от дорожно-транспортного травматизма, за которым следующим по значимости идет травматизм в быту и при

проведении досуга. В этом отношении между странами существует огромное неравенство: показатели смертности и частоты травм между странами различаются на порядок величины. Существенное снижение в целом смертности в результате дорожно-транспортных происшествий за последние два десятилетия свидетельствует о том, что эти травматизм и смертность вполне предотвратимы. Однако, к сожалению, в последнее десятилетие эта тенденция к снижению в странах в восточной части Региона приостановилась: там зафиксировано небольшое увеличение смертности, вследствие которого разрыв между показателями в новых независимых государствах бывшего Советского Союза (ННГ) и в странах - членах ЕС вырос до более 50% уровня ЕС.

Между странами существуют широкие различия в доле детей с избыточной массой тела и ожирением – от 3% до более 30% детей в возрасте 11–15 лет. Во многих странах в последние годы эта проблема, по-видимому, приобретает все более острый характер. В то же время во всех странах Региона у значительной части 11-летних (40–50% и более) недостаточен уровень физической активности. Среди 13-летних и 15-летних эта доля еще больше.

Появляется все больше фактических данных, свидетельствующих о том, что грамотно спланированные искусственная окружающая среда и зеленые зоны для общего пользования улучшают общую картину физической активности и снижают риск травматизма. Для того чтобы граждане могли в полной мере воспользоваться всеми возможностями, которые открывают для них общественные места и сети физкультурно-оздоровительных объектов, где они могли бы заниматься физкультурой и спортом и быть физически активными и при этом быть защищенными от угроз своей безопасности, которые существуют в городской, транспортной, бытовой и рекреационной средах, нужны особые подходы к удовлетворению интересов каждой отдельной группы граждан.

В большинстве стран отмечается снижение числа случаев младенческой смерти от респираторных заболеваний, но это число (12% всех случаев младенческой смерти) все еще остается тяжелым бременем для здравоохранения, особенно в восточной части Региона. От 5% до 25% детей в возрасте 13–14 лет страдают астмой и аллергиями, и это говорит о том, что эти заболевания являются все более важной причиной детского нездоровья в Регионе. Симптомы астмы обостряются в результате загрязнения воздуха, особенно вдыхаемыми мелкодисперсными взвешенными частицами (PM_{10}), и проведенные в последнее время исследования показывают, что загрязнение воздуха также может способствовать заболеваемости этой болезнью.

Загрязнение воздуха в городах, особенно мелкодисперсными взвешенными частицами, также является причиной других серьезных проблем здравоохранения на всей территории Региона, ведет к сокращению продолжительности жизни жителей наиболее загрязненных населенных пунктов более чем на один год. После существенного снижения уровней загрязнения атмосферного воздуха в большинстве стран Региона в 90-е годы прошлого столетия прогресс, достигнутый в последнее десятилетие, минимален. Более 92% городского населения, относительно которого имеются соответствующие данные о качестве воздуха, проживают в городах, где превышены нормы по PM_{10} , предусмотренные в Рекомендациях ВОЗ по качеству воздуха.

Во многих странах свыше 80% детей регулярно подвергаются воздействию вторичного табачного дыма в своих домах и даже еще в большей степени – вне дома. Хотя основанное на принципах Рамочной конвенции ВОЗ по борьбе против табака законодательство о местах, свободных от табачного дыма, и оказалось очень эффективным средством снижения воздействия табака на здоровье людей, во многих частях Региона оно все еще не внедрено или даже не разработано.

Уже четко установлено, что сырость и плесень – это важнейшие факторы плохого качества воздуха в помещениях, которые оказывают непропорционально большое воздействие на здоровье менее обеспеченных групп населения. Свыше 20% семей проживает в домах, в которых сырость и плесень

представляют значительную проблему. Методы уменьшения и устранения этой проблемы уже разработаны, но есть потребность в усилении соответствующих государственных стратегий. Повысить уровень осведомленности в этом вопросе в государствах-членах призвано недавно опубликованное “Руководство ВОЗ по качеству воздуха в помещениях”.

Значительных успехов в Регионе позволили добиться стратегии и меры, направленные на ограничение воздействия стойких органических загрязнителей и тяжелых металлов, присутствующих в пищевых продуктах, и на устранение воздействия свинца. В период с 1990 до 2003 г. выбросы свинца сократились на 90%, главным образом благодаря полному переходу в большинстве стран Региона на неэтилированный бензин. Это отразилось в снижении уровня свинца в крови детей. Однако в некоторых странах этилированный бензин по-прежнему используется, и подверженность людей его воздействию заставляет всерьез беспокоиться о здоровье населения, живущего вблизи от промышленных очагов загрязнения в восточной и юго-восточной частях Региона. Полную оценку подверженности населения воздействию тяжелых металлов провести сложно ввиду недостатка данных биомониторинга.

Успешно осуществлялось международное сотрудничество по вопросам безопасности пищевых продуктов, страны разрабатывали согласованные стандарты и нормативы и тем самым обеспечивали одинаковый уровень охраны здоровья для существенной части европейского населения. Однако в природоохранных стратегиях в отношении тяжелых металлов в большинстве стран не уделяется должного внимания охране здоровья: во всяком случае, это внимание не соразмерно тем рискам для здоровья, которые могут создавать тяжелые металлы.

Самым распространенным стресс-фактором считается шум в окружающей среде: четверть населения в странах ЕС подвержена воздействию уровней шума, которые вызывают широкий спектр последствий для здоровья. Для того чтобы можно было реально решать проблемы здоровья, во многих государствах-членах необходимо усилить стратегии по снижению воздействия шума.

В 90-е годы прошлого столетия значительно улучшилась охрана труда, но в последние десять лет улучшение в восточной части Региона прекратилось.

За последнее десятилетие значительно улучшилось положение дел в отношении наличия и доступности актуальных данных и информации, во многом благодаря новым требованиям (содержащимся в законодательстве ЕС или в международных конвенциях) об улучшении мониторинга и обмена данными между государствами-членами и мероприятиям, которые координировались Европейским агентством по окружающей среде и ВОЗ. Благодаря созданию ENHIS в Европе появился важный и эффективный инструмент анализа ситуации. Тем не менее, данные имеются далеко не по всем странам. Отсутствие необходимого мониторинга в значительной части Региона ограничивает возможность всеобъемлющей оценки ситуации во всем Регионе.

Что касается нескольких старых проблем, таких как загрязнение атмосферного воздуха, во многих странах простые меры по борьбе с опасными выбросами исчерпали себя, и этим странам нужно принять более сложные, системные подходы, чтобы продолжить снижение уровней воздействия на население. Местных мер недостаточно, для достижения дальнейшего прогресса в уменьшении загрязнения нужны меры регионального и международного масштаба. В восточной части Региона не произошло адаптации систем обеспечения качества воздуха с учетом изменившейся доказательной базы и того факта, что вдыхаемые взвешенные вещества были определены как значительный и широко распространенный фактор риска для здоровья.

Масштабы и охват государственных стратегий по тем или иным вопросам гигиены окружающей среды различаются в значительной степени. Так, например, в странах проводится широкий спектр мероприятий, направленных на традиционные опасные факторы, например, связанные с питьевой водой и водой для

купания, в том числе мероприятий, предусматривающих активное участие систем здравоохранения. С другой стороны, стратегии по решению вопросов, связанных с качеством воздуха в помещениях, профилактикой непреднамеренного травматизма или содействием физической активности, развиты в меньшей степени.

В последние годы значительно улучшилась нормативная база для принятия практических мер. В ЕС были приняты международные нормативные документы, такие как новые директивы по качеству воздуха или по обращению с химическими веществами, которые также соблюдаются и во многих странах Региона, не входящих в ЕС. За последние пять лет в странах, не входящих в ЕС, было создано, пересмотрено или обновлено более половины законодательно-нормативных актов, касающихся окружающей среды и охраны здоровья. Например, принятый ЕЭК ООН и ВОЗ Протокол по проблемам воды и здоровья содержит охранительные нормы и правила в таких областях, как комплексное управление водными ресурсами и устойчивое водоснабжение во всех странах Региона; Рамочная конвенция по борьбе против табака способствует принятию мер по снижению подверженности воздействию табачного дыма, выдыхаемого курильщиками; стратегический подход к международному регулированию химических веществ служит новой основой для обеспечения химической безопасности.

Между стратегиями, касающимися разной проблематики, наблюдаются широкие различия в степени включения вопросов охраны здоровья населения. В большинстве стран Региона охрана здоровья в достаточной мере учитывается при разработке политики в отношении питьевой воды, качества атмосферного воздуха или безопасности пищевых продуктов, но между частями Региона имеются существенные различия в политике в отношении качества воды для купания. При разработке стратегий, посвященных непреднамеренному травматизму, физической активности и загрязнению окружающей среды тяжелыми металлами, все еще редко уделяется специальное внимание вопросам охраны здоровья населения. С другой стороны, системы здравоохранения принимают участие в реализации стратегий, имеющих отношение к непреднамеренному травматизму, физической активности или вторичному табачному дыму, даже тогда, когда они разрабатывались без специального учета интересов здравоохранения.

Группы стран широко различаются между собой по пределам, методам реализации и принуждению к соблюдению требований политики, касающейся качества питьевой воды и воды для купания, непреднамеренного травматизма, физической активности, качества атмосферного воздуха, пассивного курения или шумового загрязнения окружающей среды. В целом санкции за нарушение норм и правил чаще применяются на востоке Региона, тогда как на западе более распространены планы действий по снижению рисков.

Обязанность отчитываться за охрану здоровья в стратегиях, касающихся борьбы с сыростью и плесенью, загрязнением тяжелыми металлами и шумом, меньше, чем в стратегиях по другим проблемам, а в некоторых группах стран также ниже уровень подотчетности за непреднамеренный травматизм и физическую активность. Уровень подотчетности соответствует наличию и оперативности работы систем мониторинга, имеющих отношение к здравоохранению, и использованию имеющейся информации для оценки результатов стратегий. Во многих странах Региона нерешенным вопросом остается отсутствие надежных систем мониторинга, вырабатывающих данные о распространенных проблемах гигиены окружающей среды, таких как вспышки заболеваний, передаваемых с водой, или вдыхаемые мелкодисперсные взвешенные частицы.

Большинство стран привлекли свои системы здравоохранения к участию в реализации политики в отношении питьевой воды, воздействия табачного дыма и безопасности пищевых продуктов. В отношении же большинства других проблемных тем страны значительно различаются по уровню такого участия; в определенной степени это может быть отражением различий в распределении ответственности внутри государственного сектора. Однако в некоторых случаях меньшее участие систем здравоохранения

может быть обусловлено недостатком ресурсов и организационно-кадрового потенциала у системы здравоохранения.

В большинстве стран уделяется мало внимания особым потребностям уязвимых групп населения во всех рассмотренных темах, за исключением непреднамеренного травматизма или физической активности. Следует отметить, что при формировании стратегий и при принятии решений, относящихся к окружающей среде и здоровью детей, сравнительно редко учитываются вопросы социальных или гендерных неравенств, что может усугубить проблему неблагоприятных воздействий окружающей среды со связанным с этим риском для здоровья.

Несмотря на общий прогресс в сборе и использовании данных об окружающей среде и здоровье, в рамках Региона имеются существенные различия в доступности информации, позволяющей определить приоритетность действий, а также контролировать и оценивать действенность принимаемых мер. Это мешает эффективному использованию ресурсов и делает невозможным принятие мер, устойчивых в долгосрочной перспективе. Информация, к которой имеет доступ общественность, ограничена, что снижает участие общественности в мерах по уменьшению рисков и подрывает ее поддержку стратегий, направленных на экологические детерминанты здоровья. Недостаток данных ослабляет возможность проведения анализов риска, определения приоритетности действий и мониторинга их осуществления.

Две трети (28) из 42 стран, которые прислали ответы в ходе обследования ЕОСЗД, уже разработали и еще 10 стран в настоящее время разрабатывают национальные или территориальные планы действий “Окружающая среда и здоровье детей” – главным образом как одну из составляющих других государственных стратегий или как часть национальных планов действий по окружающей среде и охране здоровья. В большинстве стран основа европейской политики (ЕОСЗД) оказала положительное влияние на меры вмешательства, предпринимаемые с целью снижения экологических рисков для здоровья детей, на создание систем мониторинга и информационных систем в области окружающей среды и охраны здоровья, на информирование и осведомленность общественности и на сотрудничество между различными секторами. Однако в четверти стран-респондентов европейский план не привел к мобилизации людских и/или финансовых ресурсов на решение вопросов окружающей среды и охраны здоровья и не стимулировал укрепления организационно-кадрового потенциала или сотрудничества с другими странами, имеющими сходные проблемы.

Ключевым фактором, ограничивающим способность планировать и осуществлять меры, направленные на улучшение ситуации в отношении гигиены окружающей среды, является наличие квалифицированных кадров и надежной организационной структуры, особенно в восточной части Региона. Наши способности решать уже известные проблемы и выявлять новые проблемы существенно уменьшаются, если сотрудничество различных секторов недостаточно или неэффективно. Отсутствие устойчивого механизма, обеспечивающего такое сотрудничество, в частности отсутствие специально выделенных статей бюджета или слишком неформальный характер сотрудничества, усложняют и само сотрудничество, и объединение ресурсов для решения общих задач.

Introduction

Good health and well-being require a clean and harmonious environment where physical, psychological, social and aesthetic factors are all given their due importance. These factors are affected by actions and choices which can secure considerable health benefits. The environment is thus not only important for its own sake, but as a resource for better living conditions and well-being.

The socioeconomic and political upheavals in the World Health Organization (WHO) European Region two decades ago had huge implications for human health and the environment. There was then major concern, in both the east and the west, about poor environmental quality and its current and future impact on people's health. Moreover, this burden was then (as now) distributed unequally within and between areas, with less affluent countries facing major environmental problems.

We should perhaps not, therefore, be surprised that the breaking of this political log-jam released enormous potential for internationally concerted action on environment and health. As early as 1989, at the First Ministerial Conference on Environment and Health,¹ a major policy framework had emerged – the *European Charter on Environment and Health (1)* – which defined the essential prerequisites of public policy in environment and health and set out a strategic vision for Region-wide joint action. Taking encouragement from the many examples of pollution reduction measures already taken and the restoration of healthy environments, the Charter set out the main principles, mechanisms and priorities for protecting and restoring the environment and improving health.

Since then, every five years, ministerial conferences have reviewed progress and developed and agreed policies under the Charter. The Fourth Ministerial Conference (held in Budapest in 2004) emphasized the needs of vulnerable groups and intergenerational issues by adopting the Children's Environment and Health Action Plan for Europe (CEHAPE). CEHAPE set the direction for health and environment action for children via four Region-wide priority goals. These goals not only address the most important environmental public health issues, in both scale and spread, but are also highly amenable to action. Taken together, they provide a valuable framework for assessing and promoting progress on the benefits for children flowing from the provision of healthy and safe environments for them.

In the early 1990s, the document *Concern for Europe's tomorrow (2)* was the first major general assessment of health and the environment in the European Region. Decisions taken then are still bearing fruit. The report highlighted the urgent need for action on environment and health (EH) information to support relevant decision-making. That recognition helped to stimulate subsequent advances in environmental monitoring, greater appreciation of its health relevance, strengthening of the EH evidence-base and a greater understanding of how to make best use of this evidence.

1 European Environment and Health Committee [web site]. First Ministerial Conference on Environment and Health, Frankfurt-am-Main, 1989 (http://www.euro.who.int/eehc/conferences/20021107_4, accessed 5 February 2010).

As a result, it is now possible to assess the effectiveness of policy measures, and to set and adjust priorities in ways that were impossible two decades ago.

Now in 2010 this progress assessment report:

- assesses national progress in implementing priority EH issues arising from the four CEHAPE regional priority goals agreed at Budapest in 2004;
- provides an update on general trends and developments in the environment and health situation in the Region;
- summarizes the status of policies on selected environmental health issues using data submitted by 40 Member States responding to the WHO survey on EH policies conducted early in 2009, and the responses from 46 Member States to the web-based survey on CEHAPE conducted in November 2009² (countries responding to the surveys are listed in Annex 1).

Objectives of the report and questions it answers

The assessment is organized in five sections: four of these correspond to the regional priority goals and the fifth explores the status of national CEHAPE programmes and mechanisms to facilitate their implementation such as intersectoral collaboration. All sections relating to the regional priority goals consist of (a) an indicator-based assessment of health and the environment in the Region, and (b) an analysis of policy profiles according to public governance and healthy public policy mechanisms.

The indicator-based assessments in the sections on the regional priority goals seek to provide information about health determinants and the economic sectors and activities creating environmental problems with their associated health consequences. This is where interventions are necessary to deliver health benefits, although policy development and implementation has rarely, if ever, been under the direct control of the health sector. Indicators used in this analysis are mostly those included in the Environment and Health Information System (ENHIS), developed by WHO in collaboration with partner institutions in 18 countries, with support from the European Commission, as part of the follow-up to the Budapest Conference. Full analysis of each indicator is presented on ENHIS fact sheets, available on the Environment and Health Information System web site (3). The topics covered by the fact sheets are listed in Annex 2.

For each regional priority goal, the EH situation assessment analysis addresses the following questions.

- What is the magnitude and severity of the selected *public health problems* and their distribution within the Region? How preventable are they, and what is the potential for improving health?
- What is the current situation regarding *environmental risk factors* that contribute to public health problems? What progress has been made since the Budapest Conference and over the last 20 years? What are the differences between and within countries? How do social inequities affect the range of outcomes?

The policy analysis highlights progress in EH policy development and implementation, including the empowerment of national health systems and the integration of EH health issues across government policies and departments. It addresses the following topics.

- *Public governance*. The assessment is based on analysis of:
 - policy development in terms of regulatory instruments used and when they were introduced; the policy drivers, objectives and scope of measures; and the approach to target-setting;
 - implementation and enforcement of policy, including an evaluation of the means of defining compliance, where responsibility lies for implementation and enforcement, and measures taken in cases of non-compliance.

² The analysis is based on data from 42 countries. Responses from four countries were received after the analysis of survey data conducted for this report was completed.

- *Healthy public policy*: how public health is integrated into the policy. This evaluates:
 - accountability for health, presenting mechanisms for maintaining government and other resource controllers' accountability to the public for the health consequences of their policies (or lack thereof), including the existence of health-relevant environmental monitoring, tracking policy progress and assessing and reporting the health impact of policy action;
 - involvement of the health sector throughout the cycle of policy development and implementation, including public health monitoring and assessment of the health impact of policies; and the involvement of health professionals in providing information to the public and in control and enforcement of policy;
 - equity considerations of the policies, notably towards children and other vulnerable and underprivileged groups, and whether there are policy measures and action plans specifically aimed at their protection.
- *Transparency and communication* explores approaches to the provision of public information on health promotion, education and risk awareness, including an assessment of how easy it is for the public to encounter information, access the media channel and understand the messages.

In the cases of regional priority goals I, II and III, the potential benefits to health of various strategies that attempt to adapt or alleviate the consequences of climate change are also highlighted.

Country groupings

The country groups used in this analysis are informal groupings that correspond broadly to countries' recent history and current political situation, as follows:

- EurG-A: the EU member states before 1 May 2004 (EU15), Andorra and the European Free Trade Association countries (17 countries responded to the survey);
- EurG-B: the EU member states who joined after 1 May 2004 (EU12) (10 countries responded to the survey);
- EurG-C: Albania, Bosnia and Herzegovina, Croatia, Israel, Montenegro, Serbia,³ The former Yugoslav Republic of Macedonia and Turkey, a diverse grouping that includes countries in the south and east of the Region with differing histories and political arrangements: some are EU candidate countries and others are potential EU candidates (6 countries responded to the survey);
- EurG-D: countries formerly part of the Soviet Union, other than the Baltic States – Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan (7 countries responded to the survey).

Fig. 1 presents the respondents to the WHO policy survey from each grouping.

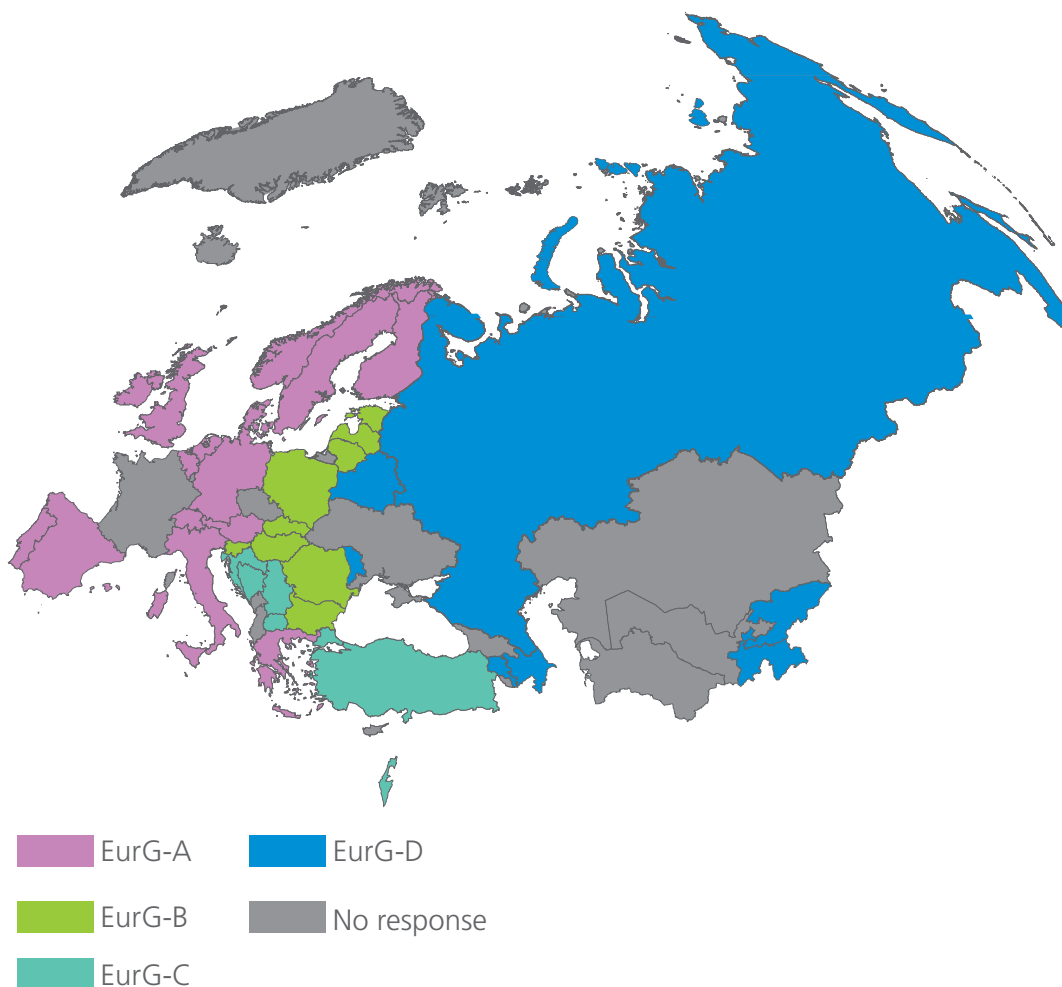
Methods of policy survey and policy analysis

The questionnaire addressed 16 specific topics covering the scope of the four regional priority goals. It was designed by invited WHO experts, reviewed by a WHO Working Group meeting in May 2008, and tested by countries that volunteered to do so in the summer of 2008. The updated version of the questionnaire (in English and Russian) was presented to the Second High Level Meeting in Madrid (October 2008) for approval.

The final version of the questionnaire was distributed to the EH focal points in the Member States in November 2008 with the aim of collecting the information by February 2009. According to the survey manual, the focal points could (and in most cases did) distribute parts of the questionnaire addressing specific topics to national experts, often in sectors other than health. This increased the reliability of the answers and multisectoral assessment of the policies.

³ Serbia and Montenegro became two separate Member States of WHO in September 2006. In this report, some data refer to the two countries separately, and some to the former single country of Serbia and Montenegro.

Fig. 1. WHO European Region Member States who responded to the WHO survey on environment and health policies, by grouping, 2009



A WHO meeting in June 2009 of experts and focal points from 29 countries reviewed the initial results of the survey and agreed on the methods for their analysis and presentation. A summary description of these methods, applied in this report, is in Annex 3.

References

1. *European Charter on Environment and Health*. Copenhagen, WHO Regional Office for Europe, 1989 (http://whqlibdoc.who.int/euro/1993/ICP-RUD_113.pdf, accessed 8 February 2010).
2. WHO European Centre for Environment and Health. *Concern for Europe's tomorrow: health and the environment in the WHO European Region*. Stuttgart, Wissenschaftliche Verlagsgesellschaft mbH, 1995 (<http://www.euro.who.int/document/WA3095CO.pdf>, accessed 8 February 2010).
3. Environment and Health Information System [web site]. Copenhagen. WHO Regional Office for Europe, 2010 (www.euro.who.int/enhis, accessed 5 February 2010)

Clean water – a basic human right

Regional priority goal I: *We aim to prevent and significantly reduce the morbidity and mortality arising from gastrointestinal disorders and other health effects, by ensuring that adequate measures are taken to improve access to safe and affordable water and sanitation for all children*

Key messages

- Population access to improved water sources, sanitation and wastewater treatment has increased over the past two decades in most Member States. Progress in many countries in the east of the Region is, however slow, giving rise to important health inequalities.
- Water-related diseases remain a burden for people throughout the Region, including in the most economically developed countries. To reduce these diseases, a change is required from the present system of controlling drinking-water solely at the tap towards quality management along the production and distribution continuum from capture to tap. Thus there needs to be a shift in policy approach from penalties to active support.
- Gaps remain in our understanding of the distribution and causes of water-related diseases. Harmonized surveillance systems for waterborne diseases and outbreaks are needed throughout the Region, as are systems for monitoring health risks related to bathing water. It is particularly important to maintain a core of expertise to advise on and conduct outbreak investigation; testing, implementing and revising procedures in cooperation with other actors; and updating regulations and policy.
- Legislation adopted in the framework of the EU *acquis communautaire* is an important policy driver throughout the Region. The United Nations Economic Commission for Europe (UNECE)/WHO *Protocol on Water and Health* (1) offers the Region-wide legal framework for the reduction of water-related diseases, integrated water resource management, a sustainable water supply compliant with WHO's *Guidelines for drinking-water quality* (2) and adequate sanitation for all.
- Climate change is adding to the challenge of providing sustainable water and sanitation services. Urgent action is required to assess systematically the climate change resilience of water supply and sanitation utilities, and to include the effects of climate change in water safety plans.

Public health importance

Water-related diseases are persistent but decreasing

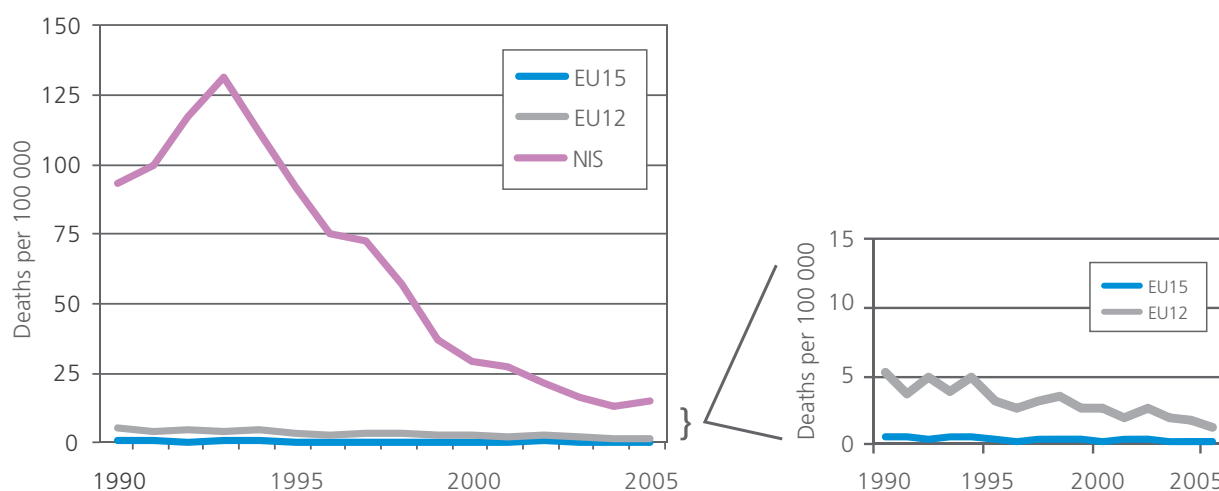
Safe drinking- and bathing water are vital for health. Illnesses arise from exposure to water contaminated by pathogenic viruses, bacteria or protozoa or by chemical substances which may enter water sources naturally or through human activity.

In the Region, diarrhoea arising from poor water quality, sanitation and hygiene is estimated to cause 33 000 deaths and 1 182 000 disability-adjusted life years (DALYs) every year, with over 90% of both occurring in low- and middle-income countries (3). These deaths are largely preventable: the

risk of water-related disease decreases where standards of water, sanitation and personal hygiene are high.

When action is taken to prevent water-related diseases, lives are saved. Mortality from diarrhoeal disease in children aged 0–4 years has fallen in the Region since the mid-1990s, with particularly dramatic reductions in the newly independent states (4). Fig. 2 shows the standardized death rates (SDR)⁴ for diarrhoeal disease in this age group in EU and newly independent states. It is both necessary and feasible to make further reductions by improving water and sanitation.

Fig. 2. Standardized death rates from diarrhoea in children 0–4 years in the EU and newly independent states



Source: WHO European health for all database (4).

The pattern of outbreaks⁵ of waterborne disease across nations can give considerable insights into the quality of drinking- and bathing water. Between 2000 and 2007, 350 outbreaks of waterborne disease related to drinking-water were recorded in the country surveillance systems and reported by 14 Member States (Fig. 3), resulting in over 47 000 episodes of illness (5). Owing to wide variations in countries' systems, their lack of sensitivity and underreporting, the differences between countries are more likely to reflect the efficiency of surveillance rather than the water-related public health situation. Even though only 14 countries submitted the key public health indicator and the limitations in the current health surveillance practices, this information show that outbreaks are not restricted to developing countries. Infants and young children are at disproportionately high risk of waterborne diseases, yet no country was able to submit child-specific information.

Region-wide, harmonized and effective surveillance systems for waterborne diseases and outbreaks thereof would greatly enhance understanding of the causal agents and the ability to prevent and eliminate the health risks. This requires urgent action related to public health.

Water-related health determinants: geographical and time patterns

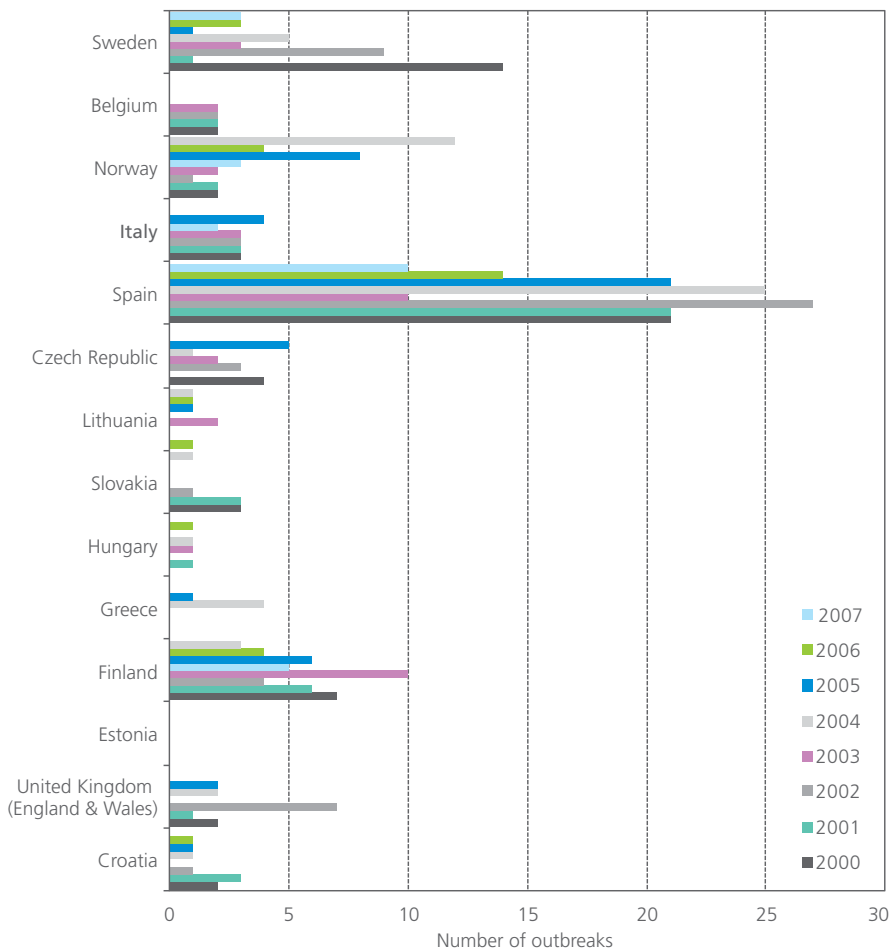
Access to improved water supply: disparities within and between countries

Sustainable access to safe drinking-water lies at the core of public health. It indicates the extent to which essential needs are met, and is defined by the United Nations as a fundamental human right (6,7).

⁴ SDR is the age-standardized death rate calculated using the direct method and standard European population structure.

⁵ An outbreak is said to occur when at least two people experience a similar illness after exposure to waste, and the evidence suggests a probable water source.

Fig. 3. Reported outbreaks of diseases arising from drinking-water in selected European countries, 2000–2007

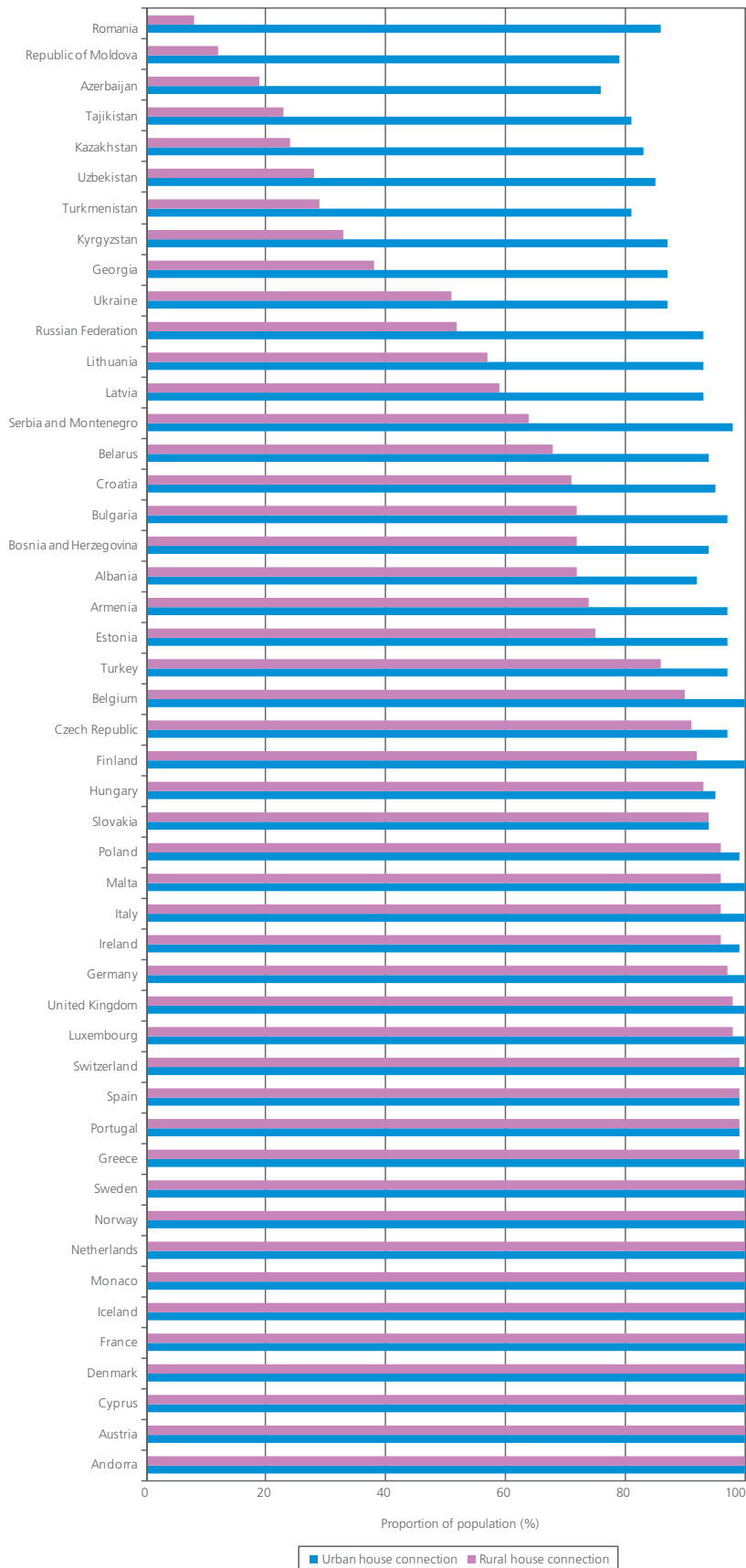


Source: WHO Regional Office for Europe (5).

The United Nations Millennium Development Goals aim to halve, by 2015, the proportion of people without sustainable access to an “improved” drinking-water supply and basic sanitation. In Europe, there is an east-west gradient for access to an improved supply of safe drinking-water, defined as permanent access to an adequate amount of safe drinking-water preferably within, or at least near to, the household (8). In western Europe (EurG-A), virtually the whole population has had access to a public water supply since the 1990s. In the east of the Region (EurG-D), access remains low (although improving), ranging from 58% to 80%. Rural populations have less access to an improved water supply, and this disparity also increases towards the east of the Region. In more extreme cases, there are four to five rural dwellers without improved drinking-water for every one person lacking an improved supply in urban centres.

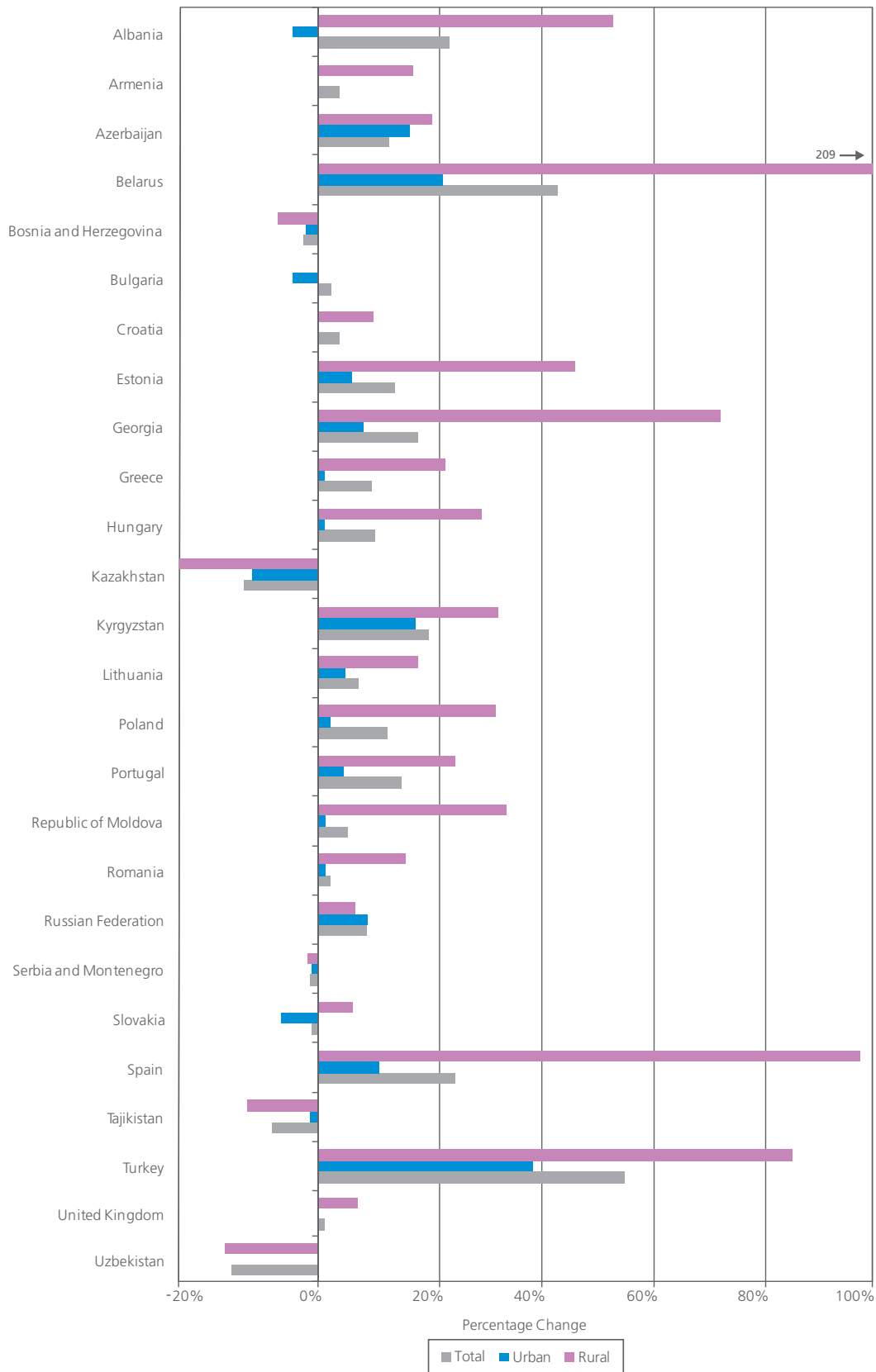
Access to improved water supplies across the Region has generally improved. Between 1990 and 2006, people in central and eastern Europe in particular experienced a marked improvement in water supplies, particularly in rural areas (8). There was however, some deterioration in access to a water supply in Bosnia and Herzegovina, Kazakhstan, Serbia and Montenegro, Slovakia, Tajikistan and Uzbekistan.

Fig. 4. Percentage of the population with house connections to improved water sources in urban and rural areas, WHO European Region, 2006 or latest available year



Note: Data for Bulgaria, Finland and Turkmenistan are for 2004.
Source: WHO/UNICEF (9).

Fig. 5. Percentage change in population with house connections to improved water sources between 1990 and 2006 in the WHO European Region



Note: For Azerbaijan, the Republic of Moldova, Tajikistan and Turkmenistan, changes are between 2000 and 2006. Countries with no change are not displayed.
 Source: WHO/UNICEF (9).

Wastewater collection, treatment and sanitation: pronounced country differences

Access to safe drinking-water does not eliminate water-related diseases. Hand-to-mouth transmission of diseases present in faeces will occur if hygienic practices are poor. Moreover, industrial and agricultural processes also contaminate water sources in various ways that require the water to receive significant treatment if it is subsequently used for human consumption. Especially in coastal areas, the discharge of untreated sewage may result in the contamination of the bathing waters and present a major human risk. Taken together, these points emphasize that sanitation and wastewater treatment are essential for public health.

Approximately three quarters of the European population live in urban environments, where the collection and treatment of urban wastewater is especially important. The proportion of the population connected to wastewater treatment facilities grew steadily in most countries between 1995 and 2005, with a connection average of approximately 69% in 2005 (10). Nevertheless, many eastern European countries still require substantial investment to reach the 80% or higher coverage typical of most western countries.

There is a conspicuous disparity between urban and rural areas in the percentage of the population living in homes connected to improved sanitation facilities. In almost all European countries, at least 60% of the urban population is connected, whereas in rural areas, mainly in the eastern part of the Region, this is often around 20% or lower (10). The situation is improving in some countries: Albania, Belarus, Hungary, Lithuania and Turkey all reported considerable progress in coverage in rural areas between 1995 and 2004. More needs to be done: it is estimated that providing access to a regulated water supply and full sanitation coverage, with partial treatment for sewage for the entire population of children in countries with low mortality in both children and adults, would save about 3700 lives and 140 000 DALYs annually (12). In the northern Mediterranean countries, and in particular in the coastal areas where the population doubles in summer, 24% of the coastal cities with populations of more than 2000 inhabitants have no access to wastewater treatment plants, affecting 2.7 million of the permanent population (13).

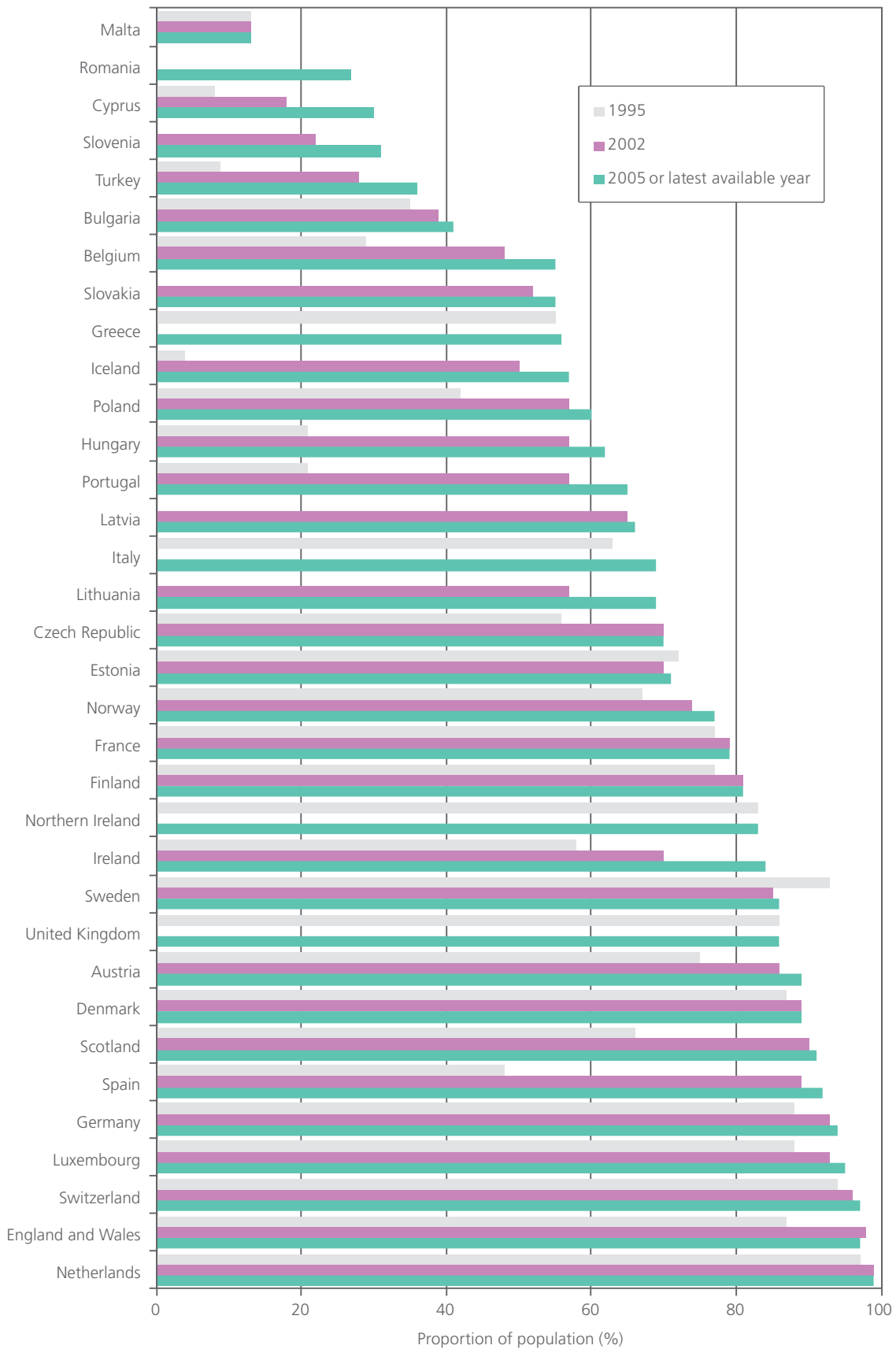
Good sanitary practices are also necessary. Even when the infrastructure has been improved, an estimated 30% of the water-related environmental burden of disease may remain unless hygiene is also improved. Better hygiene need not be complex or expensive: Promoting hand-washing with soap has been shown to be the single most cost-effective health intervention.

Safe bathing water: faltering progress

The safety of bathing water is tightly linked to sanitation and wastewater treatment: allowing contaminants to enter fresh water or the sea increases exposure by bathers and causes disease outbreaks. Children are at higher risk than adults, because they play for longer periods in recreational waters, are more likely to swallow water and may lack immunity to endemic diseases (14).

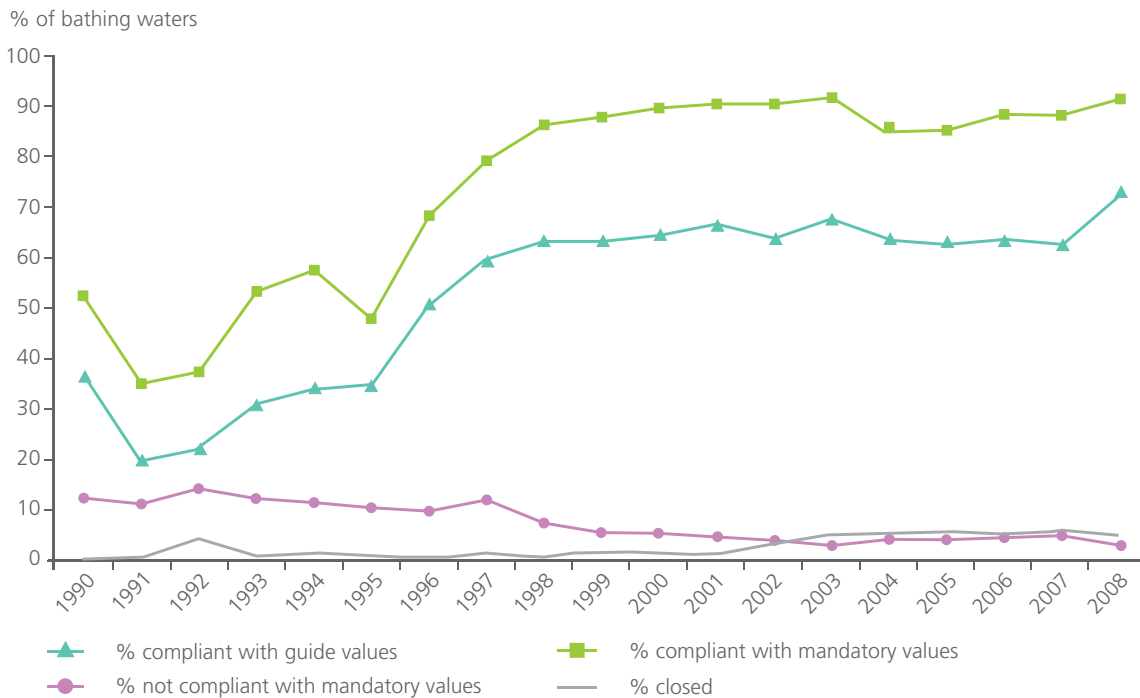
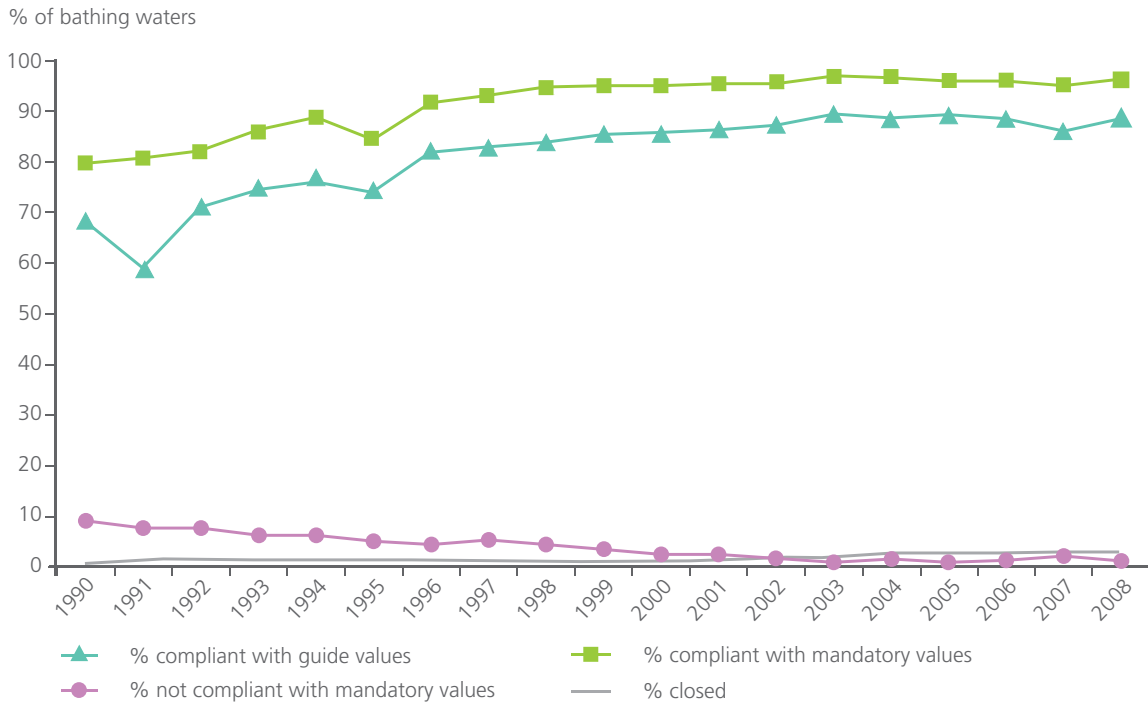
The global burden of disease attributable to gastroenteric infections arising from unsafe recreational water was recently estimated at 66 000 DALYs. Data on the public health impact of contaminated bathing water in the European Region are scarce: only nine countries have monitoring systems that record outbreaks from bathing water. Data from these countries indicate that outbreaks from bathing water are rare, causing a total of 4 to 14 outbreaks annually between them (15). The low disease burden from recreational water may be related to the known improvements in EU bathing water quality, as well as to the significant limitations of routine country surveillance. Furthermore, it is still difficult to attribute illnesses to exposure in recreational water owing to the large number of other transmission routes of the pathogens.

Fig. 6. Changes between 1995 and 2005 (or latest available year) in the population connected to wastewater treatment facilities in selected European countries



Source: EUROSTAT (11).

Fig. 7. Quality of coastal and fresh water bathing sites in the EU, 1990-2008



Source: European Environment Agency (17).

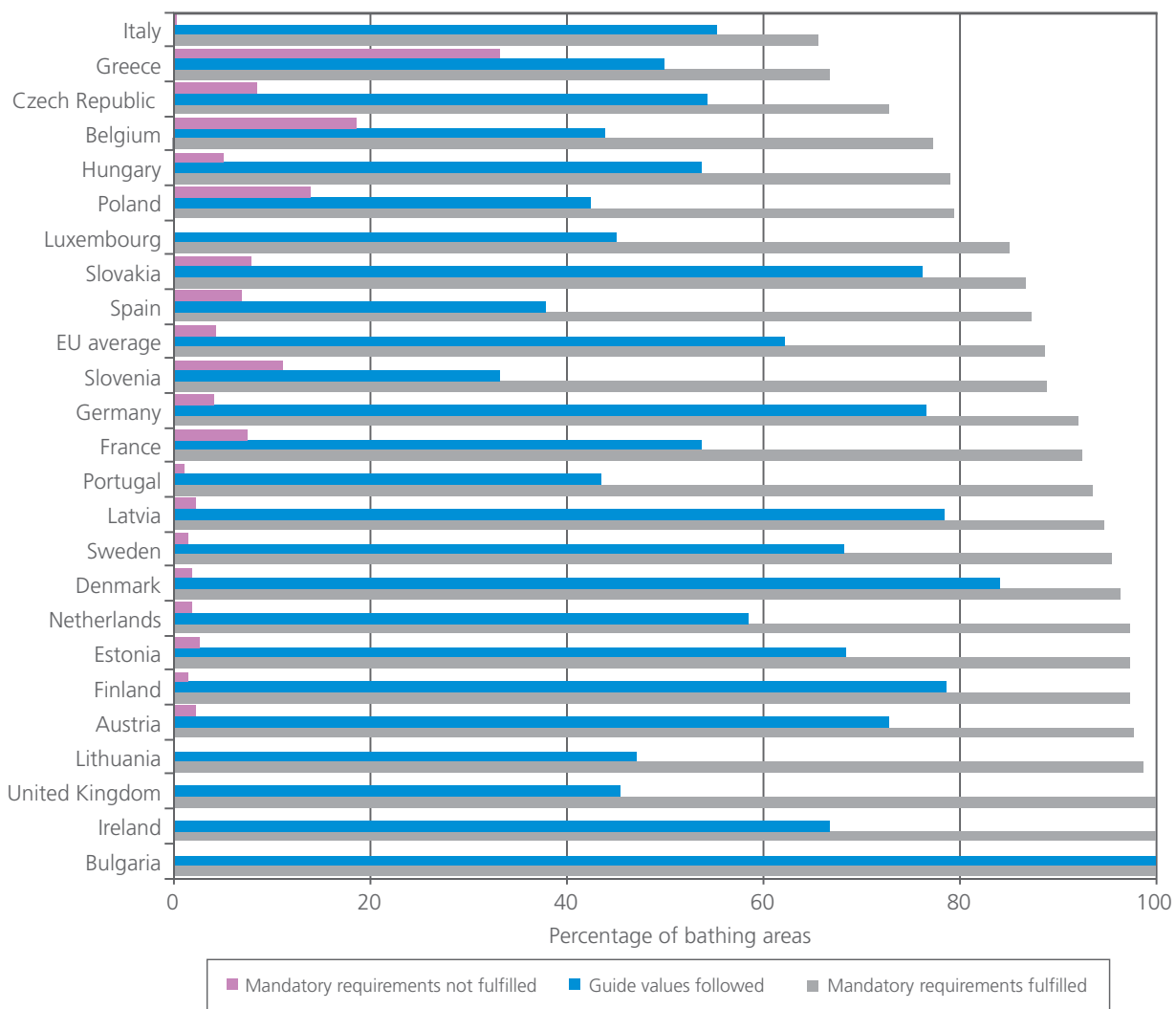
The overall quality of bathing waters in the EU has markedly improved since 1990. Compliance with mandatory values (minimum quality requirements) increased between 1990 and 2008 from 80% to 96% in coastal waters and from 52% to 92% in fresh waters. From 2007 to 2008, compliance increased for coastal waters by 1.1% and fresh waters by 3.3%. The water quality of EU coastal zones improved considerably from 1990 to 2004 and has remained high. Specifically, 95% or more of coastal bathing areas have complied with mandatory requirements since 1999 and over 85% have complied with more

stringent guide values (15). The results of the 2006 survey on the quality of bathing waters in the Mediterranean have shown that six European Mediterranean countries complied fully with national legislation and five countries had a compliance rate of 95–99%; in three countries only 30–46% of the monitored beaches were in compliance (16).

Fresh water zones have been less likely to meet standards and showed a negative trend for a period after 2003, following years of improvement (15). Compliance with mandatory values fell from 92% in the 2003 season to 86% in 2005, before rising to 89% for 2006–2007 and 92% in 2008. This can be largely explained by the increased number of bathing areas that were insufficiently sampled. Compliance with fresh water guide values also showed a negative trend after 2003 (68%), falling to 62% in 2007 before rising to 73% in 2008.

Mandatory compliance for coastal zones tends to be higher, on average, than for fresh water ones. All but two countries monitored reported over 80% mandatory compliance for coastal waters (Fig. 8). Slovenia is one of those two countries but its compliance with the more stringent guide values is higher than several other countries. Compliance of coastal bathing areas with mandatory water quality values is better on average on the North Sea, Atlantic and Mediterranean coasts than in the rest of the EU.

Fig. 8. Bathing water quality for coastal zones in countries of the EU



Source: WHO Regional Office for Europe (15).

Recent compliance with mandatory values has been highest in the fresh water catchments of the Atlantic, North Sea, Baltic and Black Sea. It is notable that some countries with poor coastal waters compliance, such as Bulgaria and Estonia, reported relatively satisfactory fresh water compliance.

Mandatory standards focus on key parameters of faecal contamination. Illness may, however, be caused by other pathogens than those covered by mandatory requirements. High levels of compliance with the standards do not necessarily mean that there are no factors that could affect public health. An expansion of monitoring schemes to the full range of parameters of WHO's *Guidelines on safe recreational water environments* (14) would minimize the number of sites that are insufficiently sampled and thereby reduce uncertainties about bathing water safety.

Emerging issues

Climate change is expected to alter the epidemiology of water-related disease in a number of ways, for example through changes to rainfall and flooding (18). Floods can have catastrophic consequences for basic water and sanitation infrastructure, distributing sewage, with its associated health risks, across entire neighbourhoods and communities. Physical damage and the loss of utility can take years to repair or recover, while the loss of heritage and items of historical importance (whether to nations or individuals), with its psychological importance and sense of well-being, can be unrecoverable. Where long-term rainfall is increasing, groundwater levels may rise and thus decrease the efficiency of the natural purification processes and increase the risks of infectious disease and exposure to toxic chemicals. Despite uncertainties in predicting the consequences of climate change, in most regions enough knowledge and technology is already available for policies to be initiated that will maximize the resilience of the water sector, taking into account the potential resilience of different water and sanitation technologies (Table 1). Necessary responses to climate change present a general opportunity for substantial improvements to health and development.

Table 1. Potential resilience of different water and sanitation technologies

	Water technologies	Sanitation technologies
Category 1: Potentially resilient to all expected climate changes	<ul style="list-style-type: none"> • Utility piped water • Tube wells 	<ul style="list-style-type: none"> • Pit latrines • Low-flush septic systems
Category 2: Potentially resilient to most expected climate changes	<ul style="list-style-type: none"> • Protected springs • Small piped systems 	<ul style="list-style-type: none"> • High-volume septic systems • Conventional and modified sewerage systems
Category 3: Potentially resilient to only a restricted number of expected climate changes	<ul style="list-style-type: none"> • Dug wells • Rainwater harvesting 	---
Technologies categorized as "not improved"	<ul style="list-style-type: none"> • Unprotected dug wells/springs • Carts with tanks/drums • Surface waters • Bottled water 	<ul style="list-style-type: none"> • Latrines without a slab/platform • Hanging latrines

Source: WHO and Department for International Development (19).

Co-benefits of providing improved drinking-water, sanitation and wastewater treatment

The provision of access to improved drinking-water, sanitation and wastewater treatment is closely aligned with other global health and non-health objectives, and will help achieve the health objectives of the fourth and seventh millennium development goals as well as, more indirectly, other goals (20).

A cost-benefit analysis undertaken by WHO in 2004 (21) found that reaching the seventh millennium development goal's target for water and sanitation would bring substantial economic gains: it was estimated that the return on investment would be 3–34 to 1, depending on the region. Moreover, maintaining clean water sources for human health also helps to maintain the environmental integrity of aquatic ecosystems, which contributes to this goal as well as other international conventions that aim to protect biological diversity.

Taken together, the multiple benefits of improved water supplies and sanitation demonstrate the need for intersectoral public policies integrating health in the context of sustainable development.

Water, sanitation and health: policy analysis

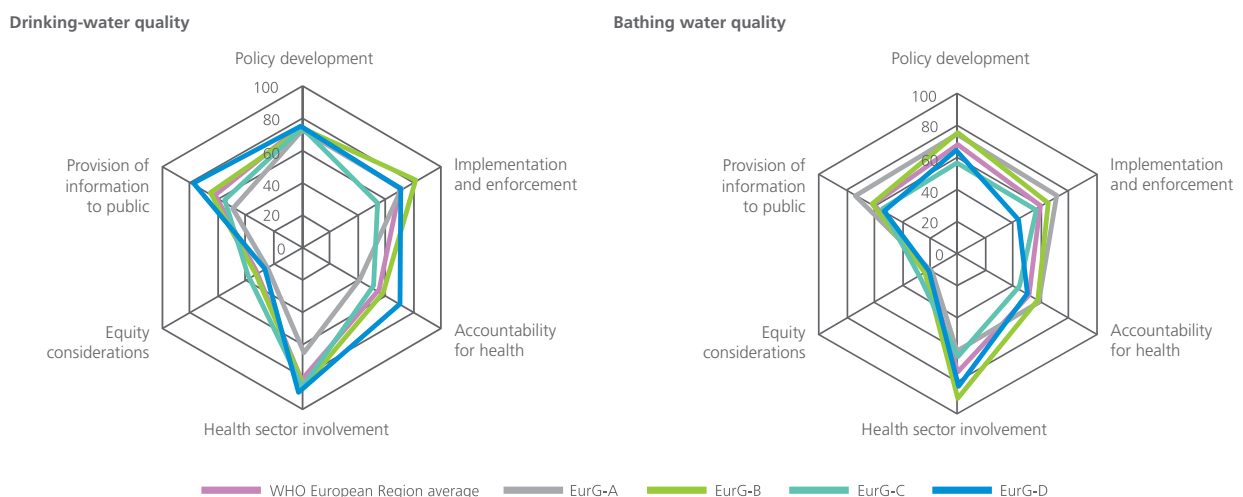
People in Europe are aware of, and concerned about, the importance of good water quality. When questioned in a major survey across the EU about the environmental issues that worried them most, almost half answered water pollution (22), second only to climate change. The importance of water quality is also reflected in the many different measures taken in Europe since the 19th century to supply people with safe water and good sanitation (23). It is no accident that a classic, and still insightful, example of a public health measure concerns water quality: the closing of the Broad Street pump in London in 1854 where Dr John Snow made the connection between a cholera outbreak and contaminated water (24).

The policy survey covered the following four topics under regional priority goal I: drinking-water quality, sanitation, sewage and bathing water quality (both coastal/fresh water and swimming pools). Thirty-seven Member States responded, although not necessarily to all the topics. Here the focus is on policies for drinking- and bathing water quality, with an analysis of the policy profiles along six key aspects of the integration of public governance and health policy (so-called “healthy public policy”). Policy profiles are presented as radar plots in clockwise order of the six aspects (Fig. 9). These are:

- policy development
- implementation and enforcement mechanisms
- mechanisms of policy accountability for health
- involvement of health sector in the policy cycle
- equity considerations
- approaches to information provided to the public.

The policy profiles for drinking- and bathing water quality show a similar pattern, with very low equity considerations reported by all country groupings (Fig. 9).

Fig. 9. Profiles of policies on drinking- and bathing water quality, by country grouping



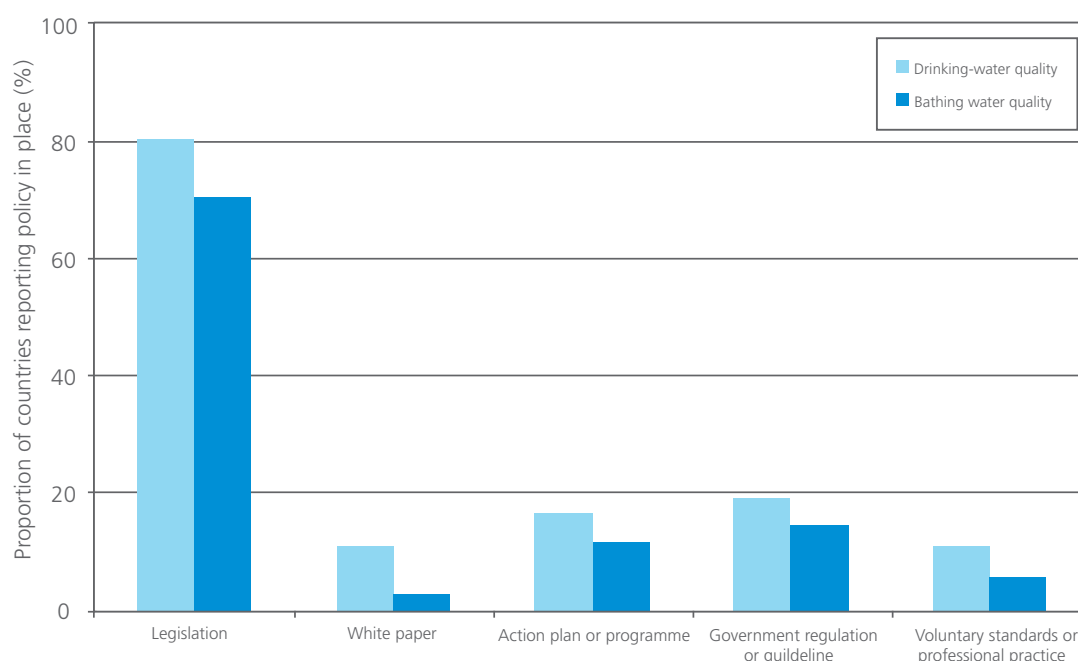
Public governance

Objectives, scope and type of policy measures

The high scores for policy development in all the country groupings indicate the importance of water quality for many decades in the Member States. A closer look at national policy measures shows that the objectives most frequently reported were those of compliance with quality standards, regulations and international commitments both at EU and Region-wide level (e.g. the *Protocol on Water and Health (1)*). The highest rates (80–100%) were in EurG-A and EurG-B countries. Less frequently reported (60–80%) were policy objectives related to management of the drinking-water supply and to reducing risks to health. This is troubling, as the *Guidelines on drinking-water quality (2)* and the *Protocol on Water and Health* have both highlighted the value of focusing on preventive management approaches along the continuum from water resources to consumer. It is also of concern that the building of infrastructure was reported as a policy measure objective less often (around 70% of countries), if the east-west disparities in access to improved water sources are to be reduced.

Around two thirds of the countries reported the existence of legislation (as opposed to action plans, programmes, guidelines, etc.) concerning drinking- or bathing water quality (Fig. 10). This is consistent with earlier assessments of European policies on water quality. There are more policies, white papers, actions plans, etc. for drinking-water than for bathing water.

Fig. 10. Types of policy instrument for drinking- and bathing water quality



Some countries reported that the quality of drinking- and bathing water was covered by more than one legal instrument: for example, Finland and Lithuania referred to more than five acts in their answers to the survey. Some laws dated back to the 1960s and 1970s (for example, in Germany) but three quarters of the laws were not enacted until the 21st century.

Impact of international policy processes on national standards

The situation regarding a number of legal acts on the quality of drinking- and bathing water already in place in many Member States (partly unique for regional priority goal I compared with the other goals) reflects the development of policy in the Region. More importantly, it reflects advances in regulatory approaches as a result of evolving scientific evidence and knowledge.

EU directives are compulsory for most of the countries within the EurG-A and EurG-B groupings. They also drive the policy and legal agenda of the accession countries in the EurG-C grouping and, interestingly, in other countries outside the EU (e.g. Belarus, Kyrgyzstan, Russian Federation) that have reported following EU legislation on drinking-water quality. The European Commission has amended and published the new bathing water Directive 2006/7/EC (25) following the advance in scientific evidence reviewed in the *WHO Guidelines for safe recreational water environments*. In its 2004 *Guidelines for drinking-water quality*, WHO introduced the concepts of risk assessment and risk management at every stage in the production and distribution of drinking-water. Currently, the Commission is amending the Drinking-water Directive (26) to incorporate the newest health standards and EU water policy and legislation (27). These developments show how international health norms can drive national policy and regulations.

There are, however, shortcomings in the enforcement of and compliance with the policies; EurG-C countries report them as partly under-provided for drinking-water quality, and EurG-D countries the same for bathing water quality. Measures to deal with non-compliance differ among the country groupings (Fig. 11). Penalties for infringements are the highest in EurG-D countries for violations of both drinking- and bathing water quality; EurG-A countries also tend to rely more on this measure than EurG-B and EurG-C countries. Action plans and remedial measures to minimize the risk of non-compliance for the quality of both drinking- and bathing water are commonest in EurG-A and EurG-B countries. The action programmes reported by EurG-C countries as a common measure to eliminate non-compliance of bathing water quality most likely reflects the importance of local tourism.

The greater number of action programmes and remedial measures to ensure the quality of drinking-water and safe water for recreation in European countries demonstrates the growing importance of those policy instruments during the last decade. WHO's work in setting health-relevant international guidelines for water quality has been an important driver for this movement. As already mentioned, the continuing revision of the EU drinking-water directive (27) in accordance with the *Guidelines for drinking-water quality* (2) will introduce a novel integrated approach to water safety applicable to all systems, from large complex piped systems to community-managed sources. Action programmes to prevent, reduce or eliminate the causes of pollution of bathing water are most often put in place by the EU countries.

Healthy public policy

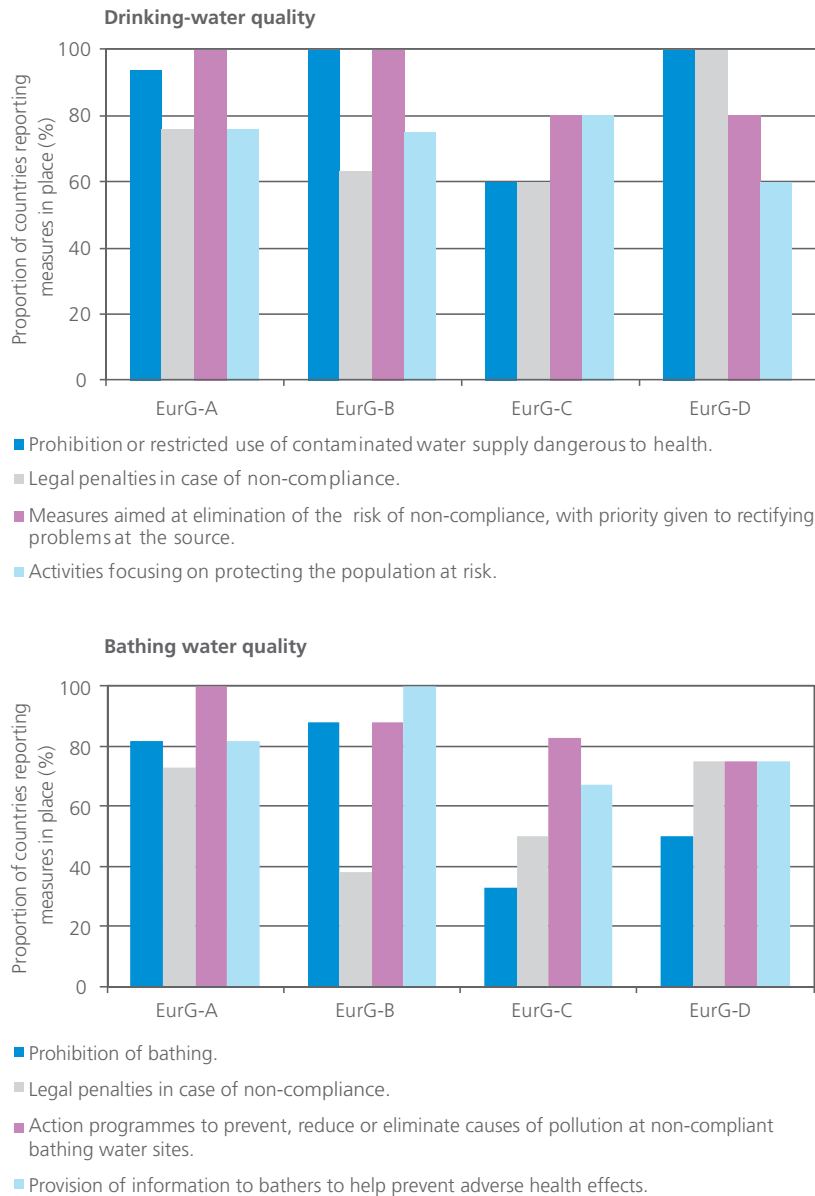
EurG-C and EurG-D countries score highly on policy accountability for health and the involvement of the health sector, in particular as regards drinking-water quality, and report a high degree of health policy integration. This is a consequence of the water and sanitation problems encountered in these countries which give rise to traditional infectious diseases (Shigellosis, Hepatitis A, etc.) and require the active intervention of the health sector (28). Nevertheless, the most effective way of providing safe drinking-water is to eliminate the risk of infection at source. These measures usually lie outside the health sector and their successful implementation requires a strong intersectoral approach.

Policy evaluation and health accountability

The two commonest evaluation methods in almost all groupings are simple information gathering and water quality monitoring networks. The most infrequent measure is the surveillance of diseases and outbreaks related to drinking-water. This information is typically included in the monitoring of general infectious diseases, which limits its usefulness for the specific purpose of control and improvement of public health. In contrast to all the others, the EurG-D countries reported to a great extent the existence of surveillance systems for waterborne diseases and their use in relevant policy-making. Unfortunately, no newly independent state provided information on water-related disease outbreaks. The same is true of mandatory periodic evaluation and follow-up on health consequences, where EurG-D countries have

a high score. A Regional Office review of the availability and quality of data required for following the health-related millennium development goals in the newly independent states has revealed considerable limitations in the water and sanitation-related indicators when assessed against international definitions of best practice (29).

Fig. 11. Measures to ensure compliance with policies for drinking- and bathing water quality, by country grouping



Periodic reviews of policy obligations and targets are also infrequent in all countries. Parties to the Protocol on Water and Health are, however, obliged to set targets, monitor progress towards these targets and report on such progress to the Meeting of Parties. Guidelines on target-setting, indicators and reporting have been developed and pilot programmes are under way.

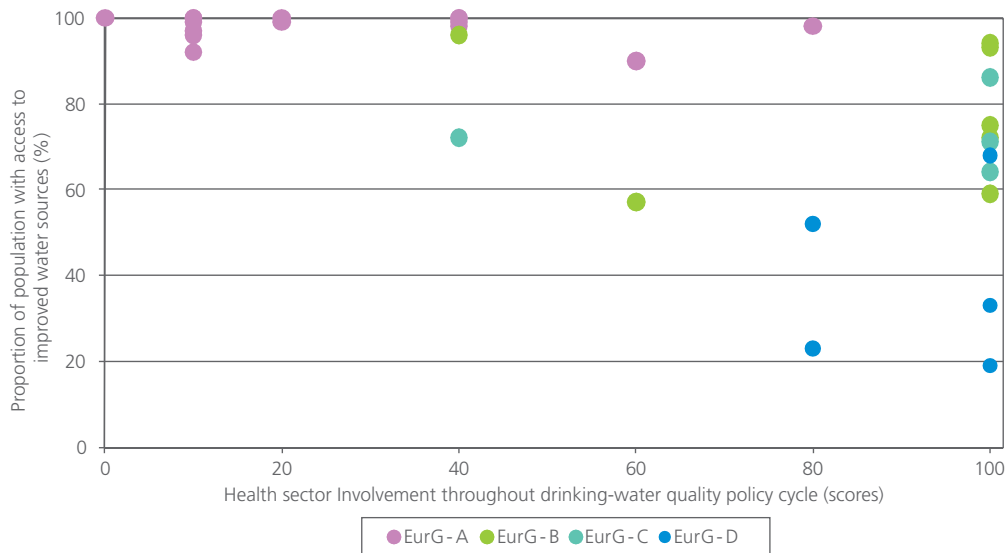
Health sector involvement in intersectoral policy action

Coordinated, integrated measures that cut across departmental boundaries and responsibilities are critically important for water and health promotion and protection (30,31). All groupings, with the exception of EurG-A, score highly on involvement of the health sector throughout the policy cycle relating to both drinking- and bathing water quality. EurG-A countries reported the lowest degree of

health sector involvement, in particular with the monitoring and evaluation of drinking-water policy implementation, while EurG-D countries had the highest scores across the entire policy cycle, including control and enforcement of policy. This may reflect differences in sector responsibilities as well as differences in the status of public health related to water questions.

This indicator-based assessment revealed both a considerable east-west divide in populations' access to improved water sources and persisting urban-rural disparities. To rely on the health sector alone to solve problems regarding water quality and the building of the underlying infrastructure may not be realistic because the responsibility for measures needed to act or to ensure compliance lies elsewhere. For example, Fig. 12 illustrates that the rural populations in most of the EurG-A countries have good access to improved drinking-water sources, while at the same time there is relatively low involvement of the health sector. Policy development and enforcement of water legislation should be the responsibility of those sectors with the means to change a situation, such as the authorities responsible for the environment or social planning.

Fig. 12. Population access to improved water sources (rural) and health sector involvement in drinking-water quality policy-making, by country grouping



Responsibility for preventive policy and infrastructural measures, and enforcing the compliance of various actors, lies with the environment or social planning sectors and – beyond them – with those responsible for setting priorities for the national agenda and investment. A subsidiary but crucial point is the need for integrated, cross-departmental intersectoral action. Within this proactive policy framework, the role of the health sector, together with the necessary resources and expertise for it to discharge its responsibilities successfully, becomes even more important. The perspective and experience of the health professions must be included whenever intersectoral policies on water and sanitation are developed, and subsequently they must be able to track and influence the implementation of those policies (32). This includes the setting of water quality standards and safety plans which adapt WHO guidelines to country-specific circumstances and monitoring of the health gains from their implementation. The health sector also has to build or maintain expertise in evaluating the underlying causes of outbreaks, and be able to implement harmonized methods of surveillance and reporting of waterborne diseases. Finally, health professionals, both generalists and specialists, are in the best position to influence personal hygiene behaviour, thus raising awareness of the determinants of water-related health and generating demands for solutions (32).

Equity considerations

All country groupings reported limited consideration of vulnerable or underprivileged population groups, including children and rural populations, in water and sanitation policies, perhaps because water and sanitation are seen as universal goods as opposed to targeted measures (23,33). Countries with advanced infrastructures may aim to secure equal universal access to water and sanitation. Given the considerable differences in urban and rural access to improved water sources, and the health risks associated with small water supplies and local wells or boreholes in rural areas, it may still be important to combine the universal approach with targeted action programmes. For example, the EurG-C countries have a relatively low score regarding specific action aimed at the population at risk in areas where the quality of drinking-water is poor (Fig. 11). This issue can easily slip “out of sight, out of mind” so (as has been pointed out many times) it is essential to maintain accurate monitoring of population coverage by water and sanitation services (23). Such statistics help to prevent this issue slipping off the policy agenda. Children’s health, and ensuring their safe water environment, is relatively low on the policy agenda: only half of the countries in the EurG-C grouping reported consideration of children in water quality policy, even fewer in the other countries. Action dedicated to education in personal hygiene and promoting hygienic behaviour in schools and kindergartens was reported by the EurG-B, EurG-C and EurG-D groupings and, to a much less extent (20%), in EurG-A countries.

Transparency and communication

Providing people with information on water quality in a readily accessible and understandable format allows them to make informed decisions regarding their health, lifestyle choices and risk avoidance, among other factors. It can mobilize public opinion and inform polluters and governments of the scale of a problem and what the public expect them to do about it.

Even though it is clearly stated in the Directives on bathing water (2006/7/EC, article 12) and on drinking-water quality (98/83/EC, article 13) (25,26) that up-to-date information on water quality must be available for consumers, the EurG-A countries score poorly in particular as regards drinking-water quality. It may not be easy to extract easily understandable yet accurate information from the vast amount of data on compliance with drinking-water parameters and standards, despite intensive monitoring. Nevertheless, it must be done. Similar challenges are routinely encountered and surmounted by professional communicators in other fields.

The EU bathing water directive from 2006 provides clear guidelines on how to inform the public about water quality (25). The directive lays down that member states must present four quality categories for bathing waters – poor, sufficient, good and excellent. According to the European Environment Agency (EEA), Cyprus, Denmark, Estonia, Hungary, Latvia, Lithuania, Slovakia, Spain and Sweden started to monitor bathing waters according to the more stringent new European legislation during the 2008 bathing season, while Luxembourg started in the 2007 bathing season (17). The EEA has created an interactive observatory bringing together data on bathing water quality with feedback and observations by millions of ordinary people (34). Another important initiative, which has been driving the development of bathing water quality, is the Blue flag programme, established and run by the Foundation for Environmental Education (35). The award of a Blue Flag beach is based on compliance with criteria covering different aspects of water quality and environmental management.

Even though the collection of information now seems to be relatively well taken care of, it is essential to establish how easy it is for the public, bathers and tourists to get access to that information and to use it to make informed choices.

Overall progress

Comparing health outcomes related to water and sanitation either between countries or over time is difficult, not least because of differences in surveillance and reporting. This is a key message of this chapter: the need to expand and standardize surveillance systems. The same is true for monitoring the quality of bathing water sites.

The data that are generally available indicate positive trends over the past 10 to 20 years. Between 1995 and 2005, diarrhoeal disease decreased in children aged 0–4 years in all European sub-regions. The proportion of the population connected to an improved water supply increased in most countries between 1995 and 2005, especially in rural areas. This trend needs to continue to close the often large gap between urban and rural areas. The proportion of the population connected to wastewater treatment facilities also increased in most countries over the same period but exhibited a similar urban-rural disparity.

Over the past five to six years, the quality of coastal bathing sites has remained high but fresh water areas have reported some decline in quality. Two future challenges are to increase the percentage of areas conforming to guide values and to reduce the number of sites that are insufficiently sampled.

This improving situation probably reflects the continuous improvement in the health relevance of international standards on the quality of drinking- and bathing water. Nevertheless, more now needs to be done. In particular, there is a need for concerted intersectoral action to ensure that those responsible for the design and implementation of new regulations (such as the authorities responsible for the environment or social planning) consult, and draw upon the skills and knowledge of, the health sector. The health sector should build and maintain expertise to be both leader and catalyst of such cross-sectoral action to improve public health.

Further development of the UNECE/WHO Protocol on Water and Health, in particular the mechanisms for compliance, monitoring and reporting and guidelines for their application in the Member States, will lead to it becoming the Region-wide legal framework for water and health.

References

1. *Protocol on water and health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes*. Geneva, United Nations Economic Commission for Europe and Copenhagen, WHO Regional Office for Europe, 1999 (EUR/ICP/EHCO 020205/8Fin, <http://www.unece.org/env/documents/2000/wat/mp.wat.2000.1.e.pdf>, accessed 8 February 2010).
2. *Guidelines for drinking-water quality*, 3rd ed. Geneva, World Health Organization, 2008 (http://www.who.int/water_sanitation_health/dwq/fulltext.pdf, accessed 8 February 2010).
3. *Global health risks: mortality and burden of disease attributable to selected major risks*. Geneva, World Health Organization, 2009.
4. European health for all database [online database]. Copenhagen, WHO Regional Office for Europe, 2009 (<http://www.euro.who.int/hfad>, accessed 8 February 2010).
5. *Outbreaks of waterborne diseases*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet 1.1, www.euro.who.int/ENHIS, accessed 8 February 2010).
6. *The right to water*. Geneva, World Health Organization, 2003 (WHO Health and Human Rights Publication Series, No. 3).
7. Committee on Economic, Social and Cultural Rights. *Substantive issues arising in the implementation of the International Covenant on Economic, Social and Cultural Rights. General comment No. 15 (2002)*. Geneva, United Nations Economic and Social Council, 2003 (E/C.12/2002/11, <http://www.unhcr.ch/tbs/doc.nsf/0/a5458d1d1bbd713fc1256cc400389e94?OpenDocument&Highlight=0,CESCR>, accessed 8 February 2010).
8. *Access to improved water sources*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet 1.2, www.euro.who.int/ENHIS, accessed 8 February 2010).
9. Joint Monitoring Programme for Water Supply and Sanitation [web site]. Geneva, World Health Organization and New York, United Nations Children's Fund, 2006 (<http://www.wssinfo.org/en/welcome.html>, accessed 8 February 2010).
10. *Access to improved sanitation and wastewater treatment*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet 1.3, www.euro.who.int/ENHIS, accessed 8 February 2010).

11. EUROSTAT [web site]. Luxembourg, Eurostat, 2009 (<http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>, accessed 8 February 2010).
12. *Study on environmental burden of disease in children: key findings*. Copenhagen, WHO Regional Office for Europe, 2004 (fact sheet EURO/05/04).
13. *Municipal wastewater treatment plants in Mediterranean coastal cities*. Athens, United Nations Environment Programme, 2004 (MAP Technical Reports Series No. 157, <http://195.97.36.231/acrobatfiles/MTSAcrobatfiles/mts157eng.pdf>, accessed 8 February 2010).
14. *Guidelines for safe recreational water environments. Vol. 1 – Coastal and fresh waters*. Geneva, World Health Organization, 2003.
15. *Bathing water quality*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet 1.4, www.euro.who.int/ENHIS, accessed 8 February 2010).
16. *Assessment of the state of microbial pollution in the Mediterranean Sea*. Athens, United Nations Environment Programme, 2008 (MAP Technical Reports Series No. 170, <http://195.97.36.231/acrobatfiles/MTSAcrobatfiles/mts170.pdf>, accessed 8 February 2010).
17. *Quality of bathing water – 2008 bathing season*. Copenhagen, European Environment Agency, 2009 (<http://www.eea.europa.eu/publications/quality-of-bathing-water-2008-bathing-season>, accessed 8 February 2010).
18. McMichael A, Woodruff R, Hales S. Climate change and human health: present and future risks. *Lancet*, 2006, 367(9513):859–869.
19. *Vision 2030: The resilience of water supply and sanitation in the face of climate change*. Geneva, World Health Organization, and London, Department for International Development, 2009.
20. Millennium Development Goals Indicators [web site]. New York, United Nations, 2006 (<http://mdgs.un.org/unsd/mdg/>, accessed 8 February 2010).
21. Evans B, Hutton G, Haller L. *Closing the sanitation gap: the case for better public funding of sanitation and hygiene behaviour change*. Paris, Organisation for Economic Co-operation and Development, 2004.
22. *Attitudes of European citizens towards the environment*. Brussels, Directorate General Environment, 2008 (Special Eurobarometer 295, http://ec.europa.eu/public_opinion/archives/ebs/ebs_295_en.pdf, accessed 8 February 2010).
23. Castro JE, Heller L. *Water and sanitation services – public policy and management*. London, Earthscan, 2009.
24. Newsom SW. Pioneers in infection control: John Snow, Henry Whitehead, the Broad Street pump, and the beginnings of geographical epidemiology. *Journal of Hospital Infection*, 2006, 64(3):210–216.
25. Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC. Official Journal, 04/03/2006, L 064:0037–0051 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:064:0037:01:EN:HTML>, accessed 8 February 2010).
26. Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption. Official Journal, 5.12.1998, L 330:32–54 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31998L0083:EN:NOT>, accessed 8 February 2010).
27. Revision of the Drinking Water Directive – The preparation of the revision [web site]. Brussels, European Commission, 2009 (http://ec.europa.eu/environment/water/water-drink/revision_en.html, accessed 8 February 2010).
28. Water, sanitation and health country fact sheets 2009 (in press). Copenhagen, WHO Regional Office for Europe, 2009.
29. Meimaneliev AS, Prochorskas R. *Availability of data in CIS countries on the health-related indicators of the Millennium Development Goals*. Copenhagen, WHO Regional Office for Europe, 2006 (<http://www.euro.who.int/Document/E89350.pdf>, accessed 8 February 2010), accessed 8 February 2010).
30. Ståhl T et al., ed. *Health in all policies: prospects and potentials*. Helsinki, Finnish Ministry of Social Affairs and Health, 2006.
31. *Environmental policy integrations in Europe – State of play and an evaluation framework*. Copenhagen, European Environment Agency, 2005 (Technical report No. 2/2005).
32. Rehfuess EA, Bruce N, Bartram JK. More health for your buck: health sector functions to secure environmental health. *Bulletin of the World Health Organization*, 2009, 87:880–882.
33. *Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. Executive summary*. Geneva, World Health Organization, 2008 (http://whqlibdoc.who.int/hq/2008/WHO_IER_CSDH_08.1_eng.pdf, accessed 8 February 2010).
34. Eye On Earth – Citizen observatory on air and bathing water quality [web site]. Copenhagen, European Environment Agency, 2009 2009 (<http://www.eea.europa.eu/data-and-maps/explore-interactive-maps/eye-on-earth>, accessed 8 February 2010).
35. Blue Flag Programme [web site]. Copenhagen, Foundation for Environmental Education, 2009 (<http://www.blueflag.org/>, accessed 8 February 2010).

Be mobile, active – and safe!

Regional priority goal II: *We aim to prevent and substantially reduce health consequences from accidents and injuries and pursue a decrease in morbidity from lack of adequate physical activity, by promoting safe, secure and supportive human settlements for all children.*

Key messages

- Unintentional injuries are a leading cause of death in young people aged 0–19 years, with road traffic injuries contributing the largest burden followed by injuries occurring in the home and leisure settings. Inequalities between countries are extreme. A substantial reduction in traffic-related deaths over the last two decades shows that these injuries and deaths are preventable.
- There is wide variability in the national proportions of overweight and obese children, ranging from 3% to more than 30% in 11–15-year-olds. The problem appears to be worsening in many countries in recent years.
- A substantial proportion (often 40–50% or more) of 11-year-olds in all countries in the Region do not engage in enough physical activity; the proportion is even higher among 13- and 15-year-olds.
- There is growing evidence that well-designed built environments and public green spaces enhance physical activity patterns and reduce the risk of injuries.
- Coordinated, intersectoral injury prevention and health promotion policies are required to reduce health burdens from unintentional injuries, low physical activity levels and obesity.
- Tailored approaches are required for specific groups of citizens to benefit from the full potential of public places and networks to exercise and be physically active, and to be protected from safety threats in the urban, transport, home and leisure environments.

Injuries and physical inactivity: public health importance

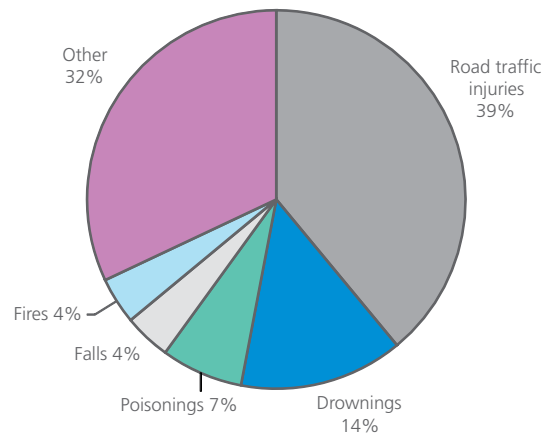
Unintentional injuries

Unintentional injuries cause 42 000 deaths in children and adolescents aged 0–19 years in the Region each year (1). Road traffic injuries are the leading cause of death (Fig. 13), while deaths from drowning, poisoning, falls and fires are also substantial (2).

Boys suffer three out of four deaths from unintentional injuries in the Region, reflecting differences in exposure patterns compared to girls, particularly in relation to road traffic injuries. Five out of six of all deaths from unintentional injuries occur in poorer countries (1). Reducing child mortality rates from unintentional injuries across the Region to the lowest national rates would prevent around three out of four deaths (1).

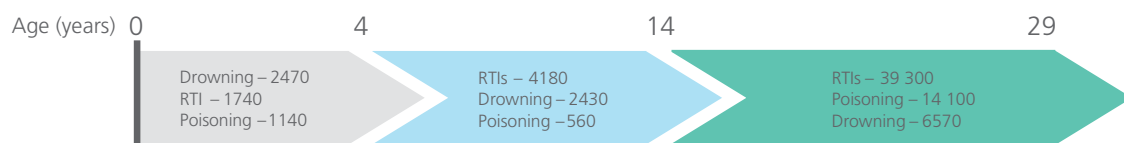
The relative importance of the causes of injury changes as a child grows through adolescence to young adulthood owing to factors including curiosity, risk behaviour and awareness, coping skills, ability to follow instructions, mobility and the extent of supervision (Fig. 14).

Fig. 13. Deaths from unintentional injuries by cause, 0-19 years, WHO European Region, 2004



Source: WHO Regional Office for Europe (3).

Fig. 14. Top three causes of death (total deaths) due to unintentional injury in groups aged 0–4, 5–14 and 15–29 years, WHO European Region



Source: WHO Regional Office for Europe (3).

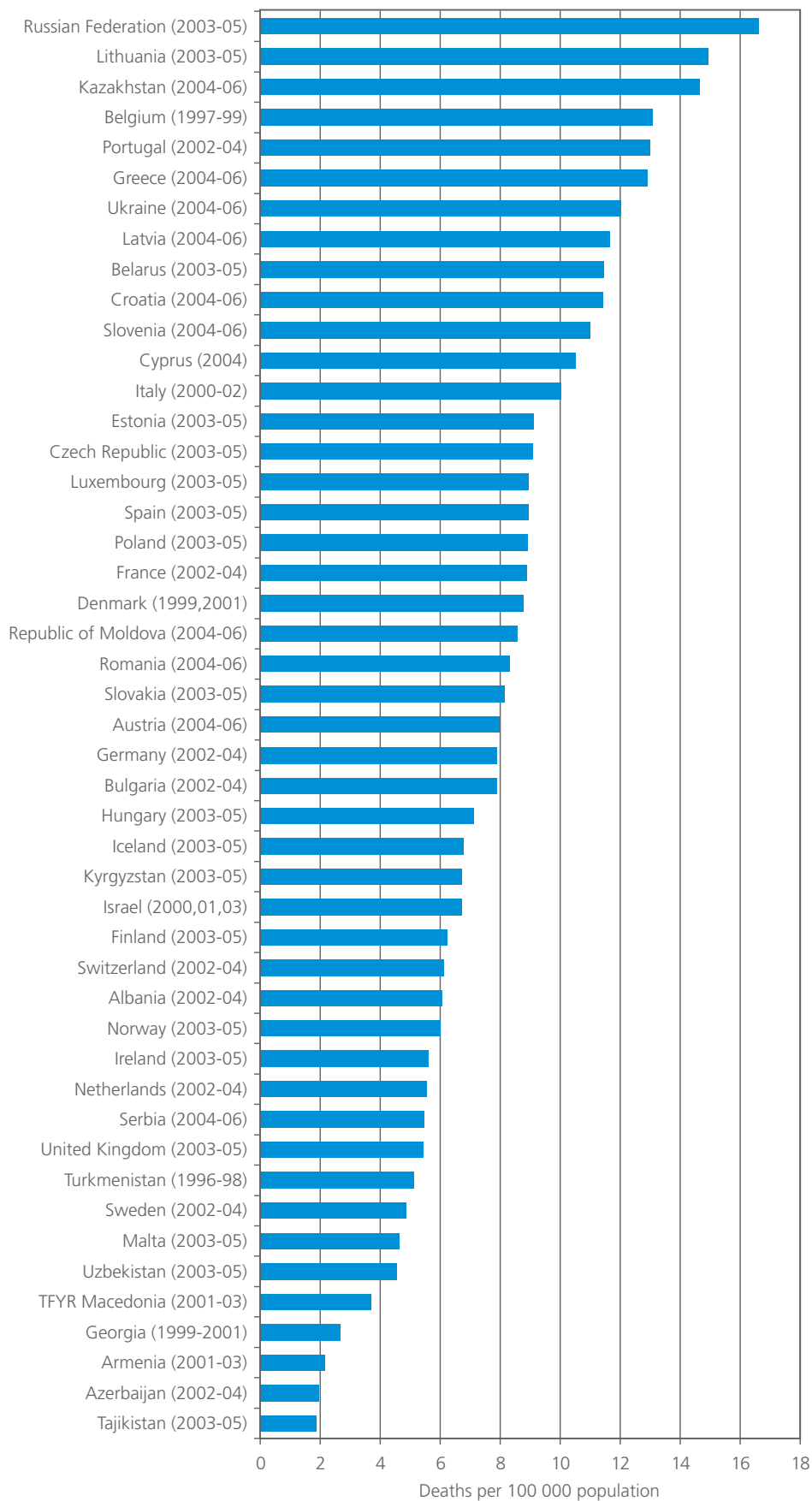
Road traffic injuries – a leading cause of death

Overall, road traffic injuries are the third leading cause of death in the Region among young people aged 0–24 years, which includes young and inexperienced drivers, causing about 100 deaths daily in this age group (4). Approximately four fifths of these deaths occur in the group aged 15–24 years, making them a major public health challenge for adolescents and young adults (5).

Deaths from road traffic injuries are not evenly distributed. Geographically, the highest rates occur in the north-eastern and eastern parts of the Region (Fig. 15). Among EU member states, those in the north have lower mortality than those in the south. It is notable that countries with the highest death rates (Kazakhstan, Lithuania and the Russian Federation) have rates seven to eight times higher than those with the lowest rates. Deaths, however, are only the tip of the iceberg; on average, there are 35 injuries for each fatality, the consequences of which persist for many years (4). Furthermore, evidence shows that up to 33% of children involved in road traffic injuries develop post-traumatic stress disorder.

Death and injury rates from road traffic injuries depend on both driving-related factors, such as the number of vehicles, driving style and risk perception, the existence of legislation and the strength of its enforcement, road design and maintenance, and factors unrelated to driving, including emergency response services, mobility options and socioeconomic conditions. The overall death rates need, therefore, to be considered within this wider context. When this is done, it strongly modifies the ranking of countries. Kyrgyzstan, for example, reports the second lowest injury rate from road traffic injuries per 100 000 population but the highest injury rate per 100 000 motor vehicles (Fig. 16). Furthermore, for many countries the data on death and injury rates do not correlate: the Russian Federation, which has the highest death rate related to road traffic injuries in young people in the Region reports a relatively modest road traffic injury rate in the same group. Variations in reporting patterns, differences in definitions, and inconsistencies are likely to contribute to at least some of the discrepancies that exist between as well as within national data.

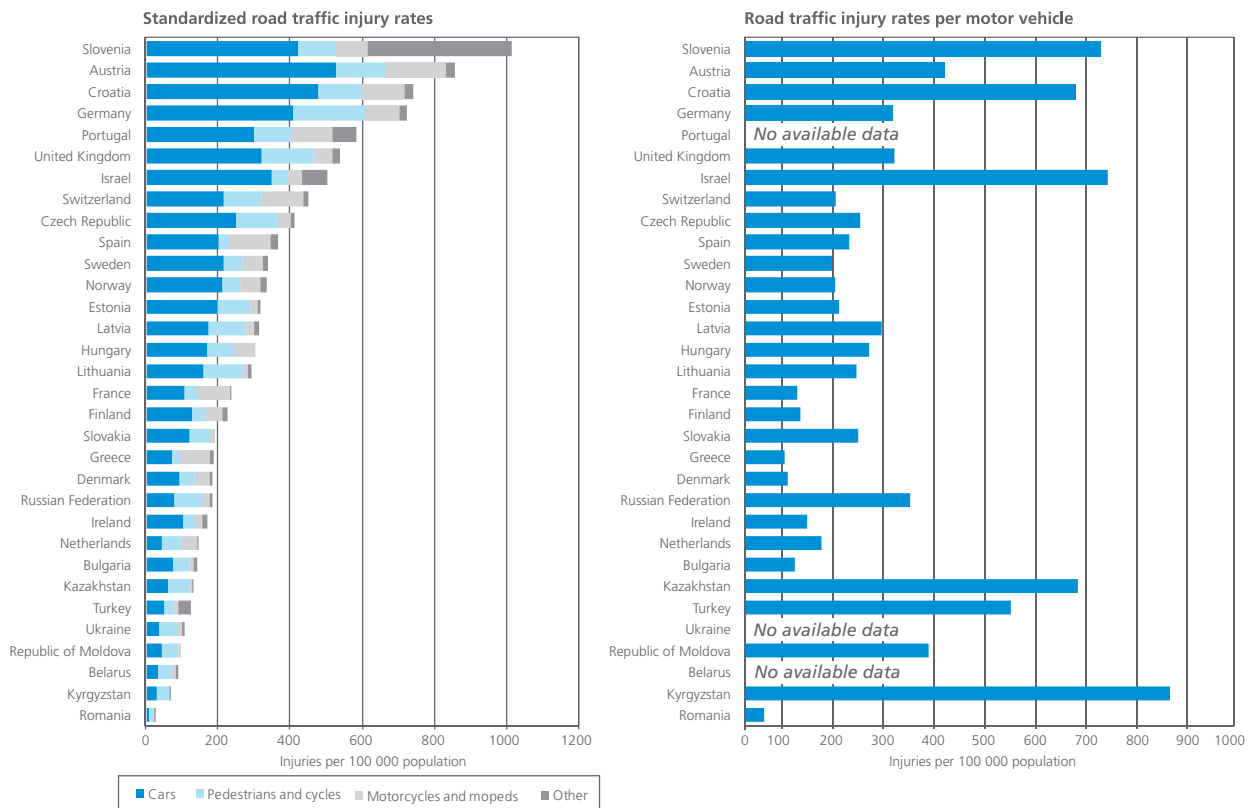
Fig. 15. Standardized death rates (three-year average) for road traffic injuries, 0-24 years



TFYR Macedonia = the former Yugoslav Republic of Macedonia.

Source: European health for all mortality database (6).

Fig. 16. Standardized road traffic injury rates, and road traffic injuries per motor vehicle, 0–24 years, 2003/2004



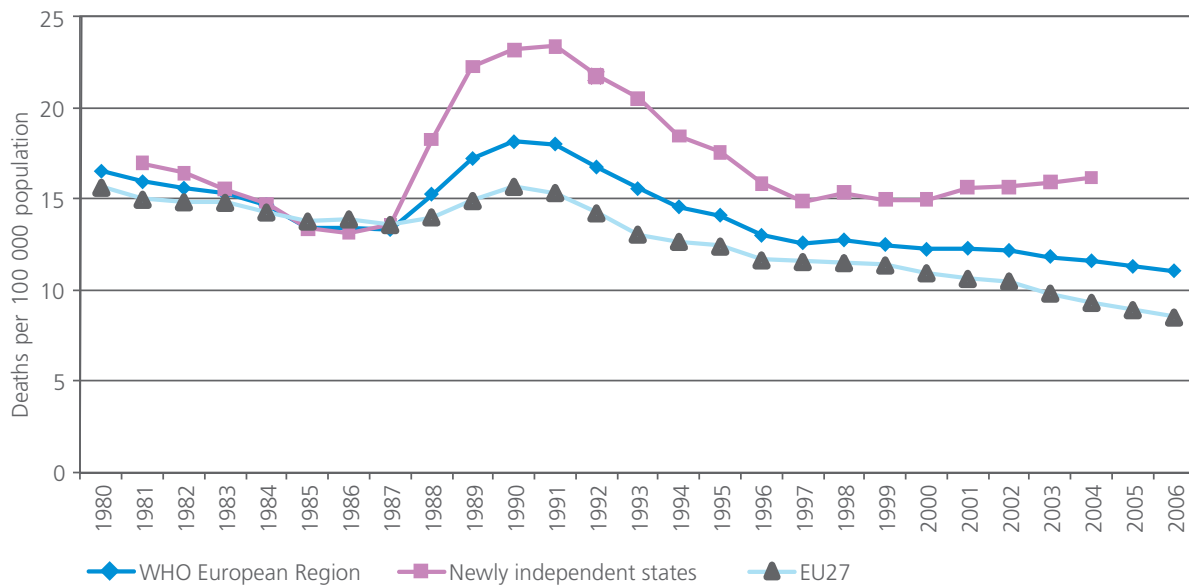
Source: United Nations Economic Commission for Europe statistical database (7).

Road traffic injuries are not all the same. Although cars are the most frequent mode of transport involved in all countries, motorized two-wheelers, cyclists and pedestrians are vulnerable road users who have the highest crash fatality rate and deserve special attention (4). Children under 10 years of age are disproportionately represented in road crashes as pedestrians, and pedestrian deaths tend to be higher in countries with lower per capita gross national income. There is also social inequity, as children in deprived areas may have a four times higher risk for pedestrian injuries than children in more affluent areas. Some 80% of those aged 0–24 years involved in vehicle crashes are male (8).

Overall death rates from road traffic injuries in the Region have declined by a third since the early 1990s, although this masks the fact that available data show that rates within the newly independent states have actually risen in recent years (Fig. 17). Still, the overall reduction demonstrates that it is possible to reduce transport-related mortality and, with a large proportion of all road traffic injuries being attributable to unsafe road environments, that interventions focusing on the road environment can contribute significantly to this reduction. Separating different types of road user through the use of bicycle lanes, pedestrian walkways, raised crossings and so on, is an important infrastructural intervention. Other important risk factors that need to be tackled include speed, alcohol, and not using protective equipment such as seat belts, child car restraints and motorcycle helmets. Road traffic injuries are a consequence of many different factors so successful programmes will require intersectoral initiatives and should receive close attention at all levels of society.

In addition to the individual health burden, the economic costs of road traffic injuries to society are also sizeable: estimates suggest that they cost about 2% of the gross domestic product (10). The costs of road traffic fatalities among those aged 0–24 years in the Region are an estimated US\$ 38 billion.

Fig. 17. Mortality rates from road traffic injuries per 100 000 population, newly independent states and EU27^a, 1980–2006



^aAll member states of the European Union since 2007.

Source: WHO Regional Office for Europe (9), based on WHO European health for all mortality database (6).

Unsafe homes and neighbourhoods

Some of the major causes of death from unintentional injury involving children and adolescents in the Region are drowning, poisoning, falls and fires (2). Death rates from all four causes have declined since 1995 (Fig. 18), but current rates are still high in many countries and vary greatly across the Region. Death rates in children and adolescents are generally lowest in western Europe and highest in some eastern European countries and newly independent states (Fig. 18). This inter-country inequality in child injury mortality is extremely pronounced. Countries with the highest and lowest rates differ:

- 20-fold in terms of the risk of drowning,
- 30-fold for poisoning,
- 85-fold from fires and
- 22-fold for falls.

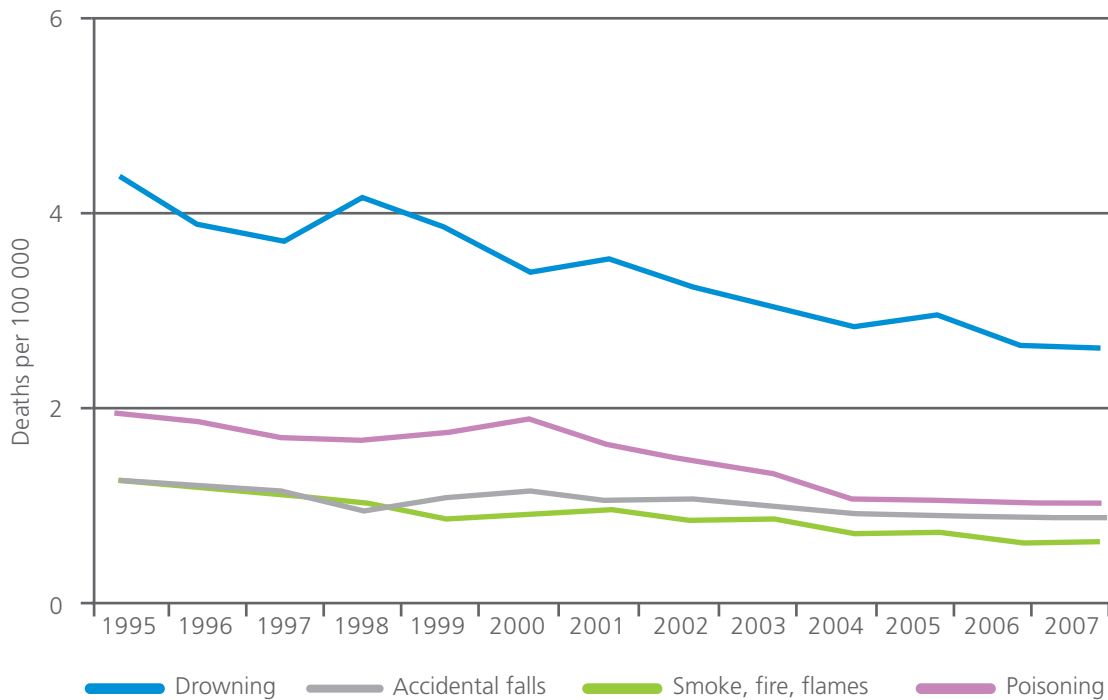
The relative contribution to all deaths from these four causes in the group aged 1–19 years also differs widely between countries (Fig. 19) (2).

Within unsafe environments, a variety of factors can lead to many different injuries, and the appropriate measures to protect children vary accordingly (Table 2).

Socioeconomic factors also play a key role in injuries to children. For example, poorer households are more likely to live in or near unsafe environments and to resort to (or be forced by circumstances into) unsafe behaviour such as poor supervision of children.

Deaths from these four hazards alone again only tell part of the story. For each child's death between 0–14 years caused by unintentional injuries at home or at leisure, there are an estimated 160 hospital admissions and 2000 visits to emergency departments (12). These incidents may have long-term physical and psychological consequences (13).

Fig. 18. Standardized death rates from drowning, falls, fire and poisoning, WHO European Region, 1995–2007



Source: WHO European detailed mortality database (11).

Excess weight and obesity: an epidemic

Excess weight and obesity in young people are major risk factors for chronic disease and are associated with an increased risk of adult obesity and premature mortality (14). Accordingly, WHO already recognizes that excess weight and obesity in childhood have reached epidemic proportions in most industrialized countries.

A major concern is that the prevalence of overweight and obese children and adolescents continued to increase in more than half of the countries from 2001 to 2005 (14). Only three countries (Austria, France and the United Kingdom (England)) showed a fall in the prevalence during this period for both boys and girls (Fig. 20).

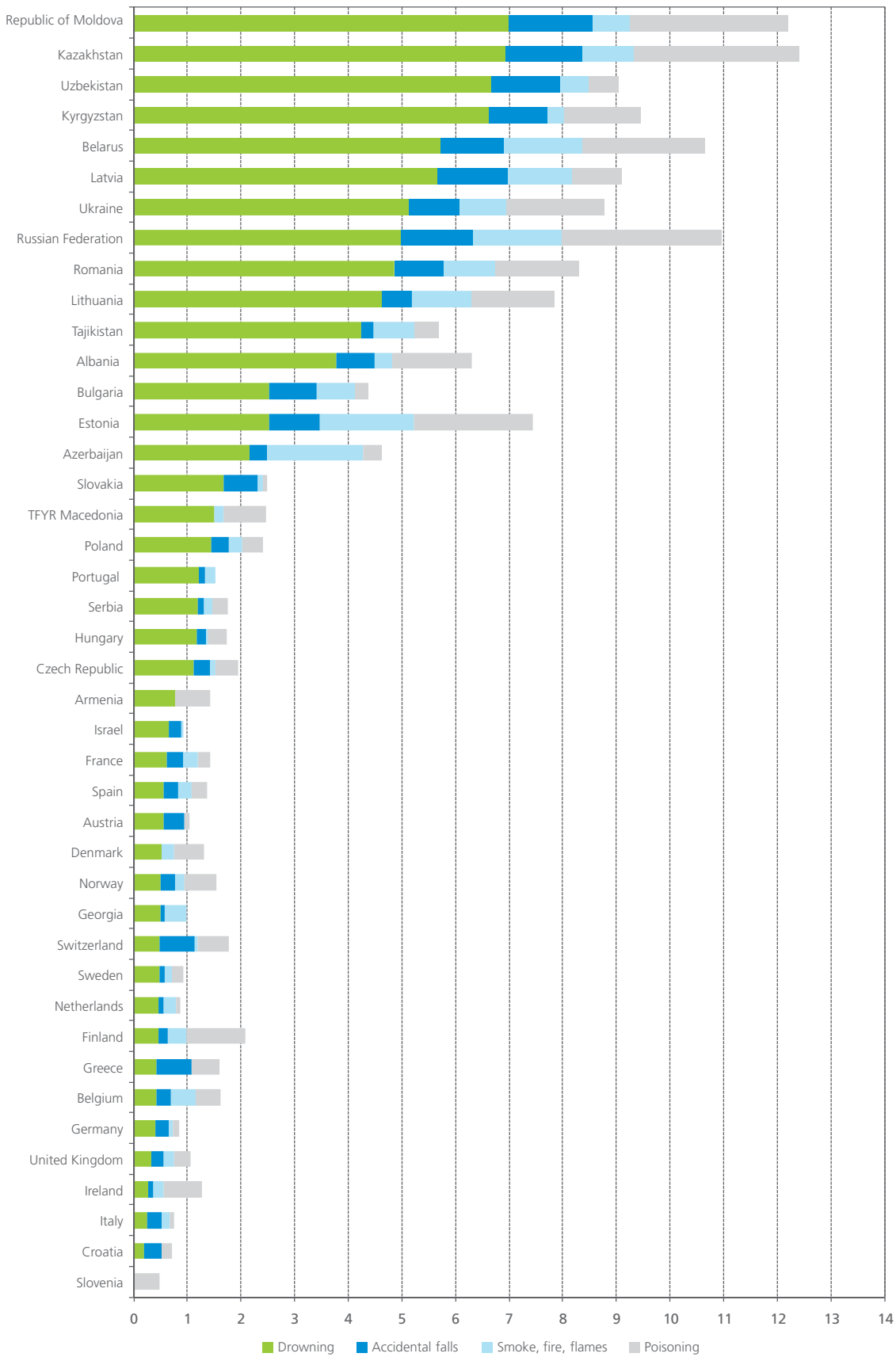
There are wide variations in the prevalence of obese and overweight children among countries in the Region, ranging from 4% to over 30% of 11–15-year-olds being overweight (Fig. 20). Most countries show a greater proportion of overweight boys than girls. However, there is little evidence of significant age differences or of any clear geographical pattern.

These trends reveal that despite many international and national efforts, the anticipated positive consequences have not become apparent. Further dedication and innovation may, therefore, be required. An increasing incidence of obesity-related chronic diseases in adolescents, such as type II diabetes and hypertension, foretell a larger burden of disease if no appropriate action is taken.

Physical activity: getting active

Physical activity improves well-being: its benefits to physical and mental health are well-documented at all ages, and it helps prevent overweight and obesity, type II diabetes, cardiovascular disease, hypertension and some forms of cancer (16).

Fig. 19. Standardized death rates from drowning, poisoning, falls and fires, 1–19 years, 2006 and earlier



TFYR Macedonia = the former Yugoslav Republic of Macedonia.

Note: All rates are standardized by age.

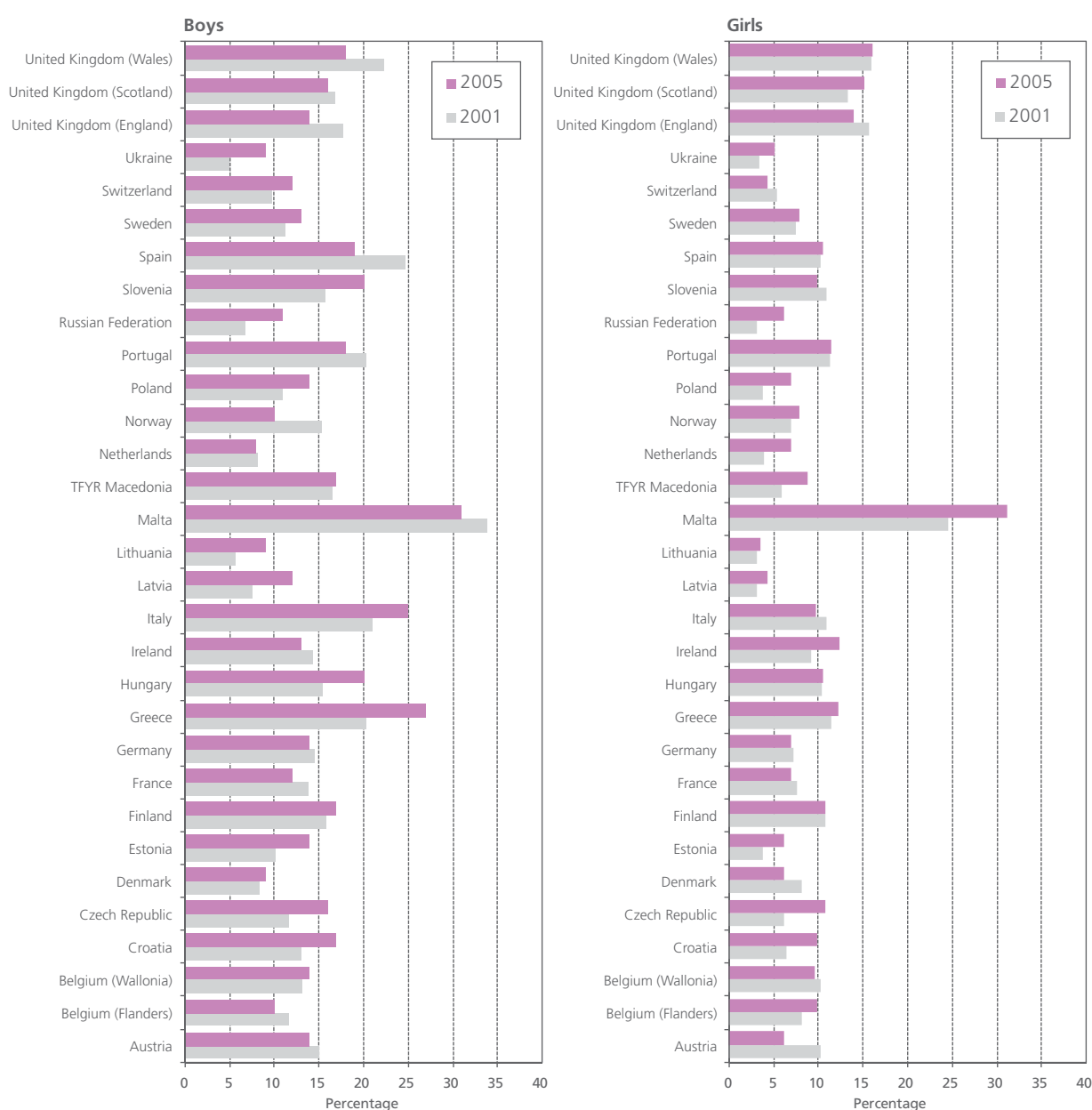
Source: WHO European health for all mortality database (6).

Table 2. Some options to reduce injuries to children from four different hazards

Drowning	Poisoning	Fires	Falls
Cover water hazards	Ensure child-resistant packaging	Install fire alarms	Install window guards
Remove water hazards	Store toxins safely	Install thermostats	Modify unsafe products
Fence water hazards	Create poison control centres	Apply standards for cigarette lighters	Apply playground standards

Source: WHO Regional Office for Europe (2).

Fig. 20. Prevalence of overweight (including obese) 13-year-olds in 31 countries and areas of the WHO European Region, 2001 and 2005



TFYR Macedonia = the former Yugoslav Republic of Macedonia.

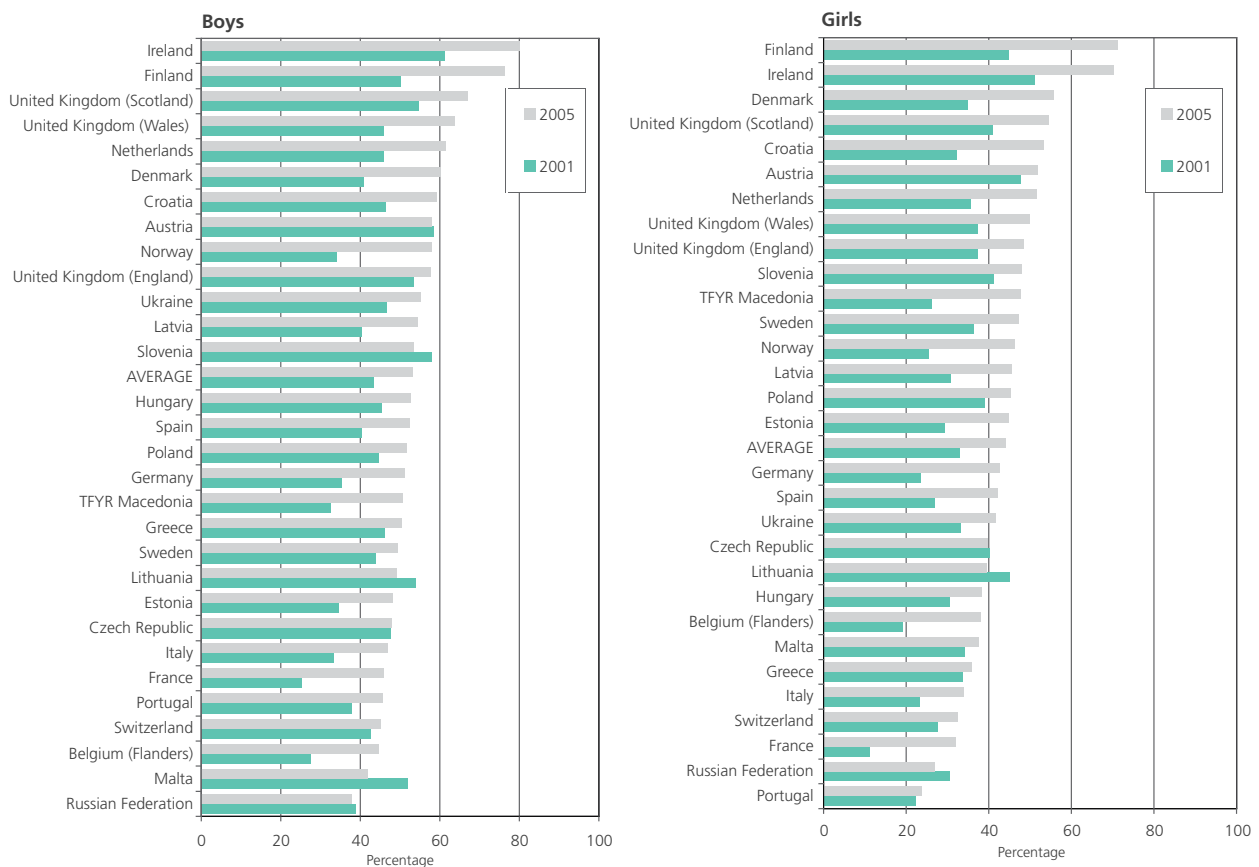
Source: Currie C et al., (15).

How active children are tends to be influenced by demographic factors (age and socioeconomic status), psychological factors (perceived competence and enjoyment), social factors (encouragement from parents or peers and cultural attitudes), the educational environment (the number of hours of lessons and home-work), and the physical environment (the availability of safe opportunities to be active, or walking and cycling as reasonable mobility options). Physical education in day care centres and schools is – either as curricular or extra-curricular activity – important as well.

Information on physical activity in the Region is not yet fully standardized and available for all countries. In children and adolescents, one of the most comprehensive sources of information is provided by the Health Behaviour in School-aged Children (HBSC) study, which documents the proportion of children having at least 60 minutes of moderate-to-vigorous physical activity at least five days a week (16). This study was conducted in 2001/2002 and repeated in 2005/2006.

Although the study was based on self-reported activity (as opposed to objective measurement), it revealed that in all countries a considerable proportion of children and adolescents do not reach the recommended levels of physical activity. Among 11-year-old boys, only 38% achieved the recommended levels of activity in the Russian Federation and 80% in Ireland in 2005/2006. For girls of the same age, these rates ranged from 24% in Portugal to 71% in Finland (Fig. 21).

Fig. 21. Sufficiently physically active 11-year-olds, selected countries of the WHO European Region, 2001/2002 and 2005/2006 (%)

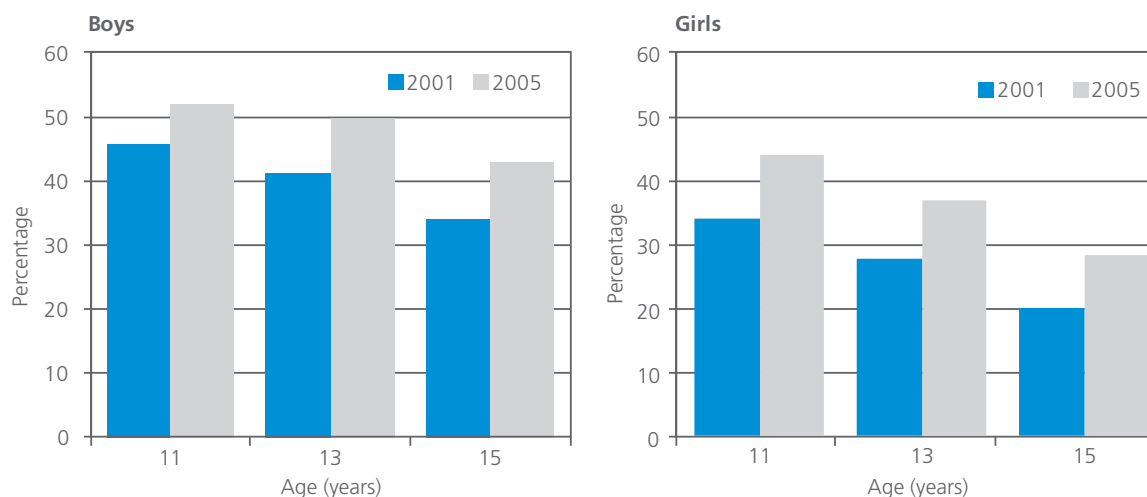


TFYR Macedonia = the former Yugoslav Republic of Macedonia.

Source: WHO Regional Office for Europe (16).

The study also revealed that physical activity levels are generally less frequent among girls than boys and that the percentage of sufficiently active children decreases with age in both sexes (Fig. 22). However, a positive indication is that in 2005/2006, recorded physical activity was noticeably more frequent in all age groups for both boys and girls compared to 2001/2002. Further monitoring will follow this positive development.

Fig. 22. Average percentage of physically active boys and girls in Europe, 2001 and 2005



Source: WHO Regional Office for Europe (14).

Potential health benefits from mitigating climate change

Strategies aimed at mitigating climate change are anticipated to have numerous implications for human health, including effects on unintentional injuries, physical activity and obesity. In particular, policy choices in the transport sector are likely to have a major influence on healthy mobility and physical activity. Among other effects, future transport policies may influence the type and number of vehicles on the road and, correspondingly, support and promote active travel opportunities that do not cause CO₂ emissions. These changing patterns may, in turn, affect levels of physical activity as well as the frequency and severity of road traffic injuries. Similarly, urban development plans that promote mixed land use and compact cities can reduce the need for long-distance travelling and dependence on cars, opening up opportunities for short trips to be undertaken on foot, by bicycle or on public transport.

A recent paper comparing future (2030) health impacts of alternative transport-related climate mitigation strategies with a baseline “business as usual” scenario in London and Delhi found that strategies incorporating steps to increase active travel were beneficial in both cities. The number of DALYs in the two cities were reduced through enhanced physical activity (by around 7000 DALYs per million people per year in each city) compared to the baseline scenario (17). A policy that simply reduced motor vehicle emissions without fostering active transport did not alter levels of physical activity.

In terms of road traffic injuries, the results were mixed: Delhi showed a considerable reduction in the burden from them (by around 3500 DALYs per million people per year), while the burden in London increased somewhat (by 500 DALYs per million people per year), due to the higher number of vulnerable pedestrians and cyclists. Importantly, this evidence points to an overall public health benefit that greatly overcomes the possible increase in road traffic injuries, which in turn can be controlled through effective preventive measures.

Climate change mitigation may also affect other environmental health concerns discussed here. For example, novel rainfall and flooding patterns could have important local impacts on the rates of injuries and drowning. Taken all together, the adoption of climate mitigation policies that act at the level of

urban and transport planning offers an important opportunity to improve environmental safety and to gain the corresponding co-benefits for health.

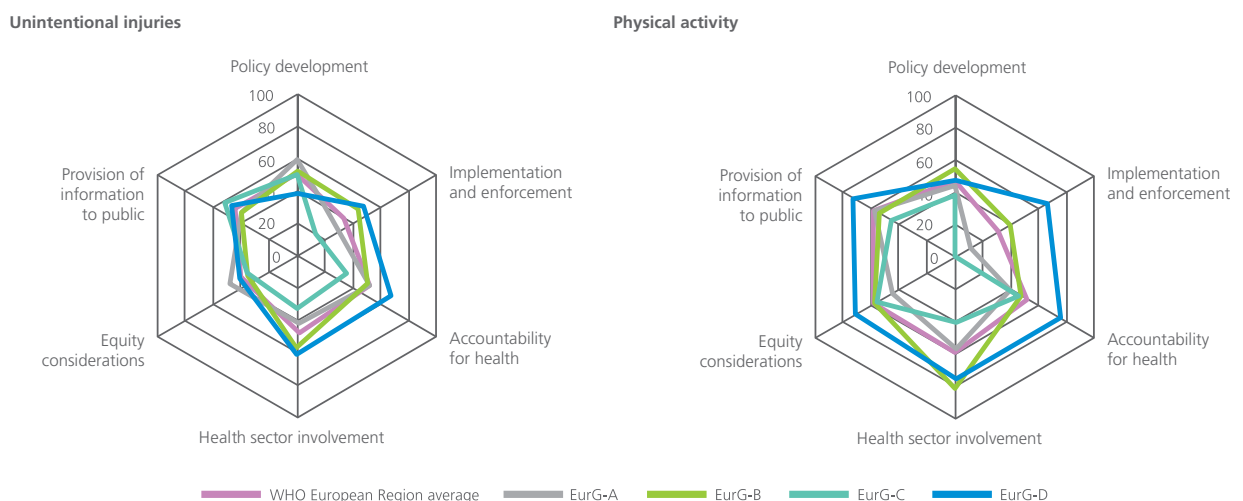
Injuries, health and safety: policy analysis

The saying “injuries are no accidents” may seem obvious today, but for a long time, injuries were regarded either as inescapable occurrences or as the consequences of human carelessness (18, 19). This situation has, however, changed during the last decade, which is obvious when the increase in research on injury prevention since the start of the 1990s is taken into account (20). Another recent change in perception concerns physical activity. In addition to psychological or social barriers to physical activity, in recent years there has been a growing realization that environmental factors are also important (21). Research shows, for example, that neighbourhood characteristics of the built environment (such as the existence of sidewalks and walking and jogging trails, and perceived safety from crime) are associated with physical activity (22,23). Purpose-built bicycle routes or lanes reduce the risk of crashes and injuries compared to cycling on the road with traffic (24). This shows that environmental changes can both reduce injuries and increase the levels of physical activity in a community.

Three topics from regional priority goal II were selected for policy screening in the policy survey: road traffic injuries, unintentional injuries (excluding road traffic) and physical activity. A total of 33 Member States replied, although responses did not always include all topics. This assessment focuses on unintentional injuries (excluding road traffic injuries) and physical activity. Road traffic injuries have been extensively reviewed elsewhere in a recent WHO report (9).

Policy profiles for unintentional injuries unrelated to traffic and physical activity covering the six aspects (policy development, implementation and enforcement, accountability for health, health sector involvement, equity considerations and provision of information to public) reveal similar and symmetrical patterns between country groupings (Fig. 23). The main exception is the implementation and enforcement aspect of the physical activity policy profile, which ranges from 0% to 70% and thereby indicates that different groups of countries show very different degrees of implementation and enforcement of policy. Implementation and enforcement are also recognized as the weakest dimension for both physical activity policies as well as injury-related policies: only for this policy dimension do the values drop below 20%. Similarly, for both health issues policy development is not very strong. In comparison, the involvement of the health sector is quite strong in most country groupings, with EurG-C countries reporting the lowest involvement levels in both cases.

Fig. 23. Policy profiles for unintentional injuries unrelated to traffic and physical activity, by country grouping



Public governance

Objectives, scope and type of policy measures

As both physical activity and injury prevention are public health challenges that have become more important in recent years, they may be relatively novel to policy-makers. This is one possible explanation for why policy development and implementation and enforcement in regional priority goal II shows clearly lower scores compared to, for example, the first regional priority goal, or outdoor air quality discussed in regional priority goal III, which are longstanding environmental health concerns for which policies have been developed and applied for many decades. The relatively low scores may also, however, be due to difficulties in regulating leisure time injuries or physical exercise by laws or binding agreements compared, for example, to health and safety practices at the workplace. Moreover, it is possible that regional or local authorities, not the national governments who received the questionnaire, are responsible for tackling this issue. Still, a strong national policy framework on which to base local action would seem to be of equal importance.

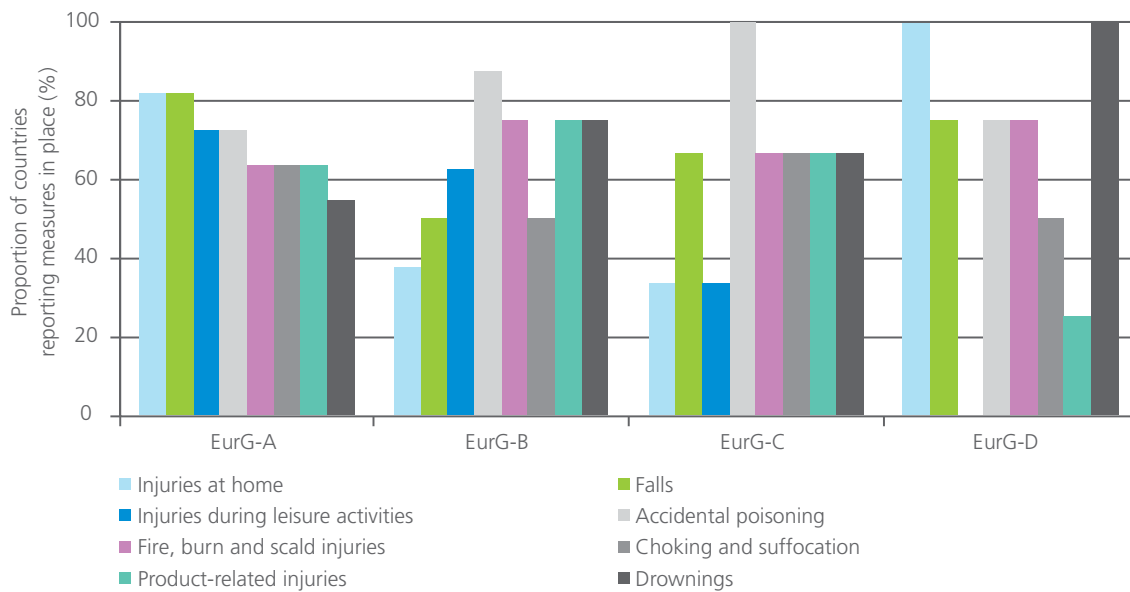
Yet another possible explanation for the low level of policy development is that the responsibility for physical activity may have fallen between two chairs, with no actors seeing themselves as owners of the issue. The low scores on policy development and implementation and enforcement may indicate that there are only a few regulations in these areas. At the same time, the responses to the survey suggest that in several countries the health sector may not be in a leading position within the government when it comes to the promotion of physical activity and prevention of injury: the scores for health sector involvement are relatively high but, considering the issue and its impact on health, they should be even higher since the health sector should represent the driving force on this issue.

Compared to, for example, regional priority goals I and III, there are relatively high scores on equity considerations, which might indicate that the regional priority goal II policy measures (such as information, education and promotion of health and safety) focus on specific settings or exposed population groups that are most at risk. More detailed policy analysis is, however, needed to identify how, and to what extent, the still evident equity gaps can be reduced within the existing policy context.

All country groupings pay attention to unintentional poisoning (Fig. 24) but emphases vary when it comes to unintentional injury during leisure activities (see, for example, the low level of policy measures in EurG-C and EurG-D countries) and injuries at home (the low level of policy measures in the EurG-B and EurG-C countries). The relatively low overall scores for home and leisure injuries are of concern, as injuries in those settings are a major burden in Europe. It is estimated that 78 000 deaths were caused by home and leisure injuries in 2005, with the eastern part of Europe (especially the Baltic countries) experiencing the highest mortality rates (25).

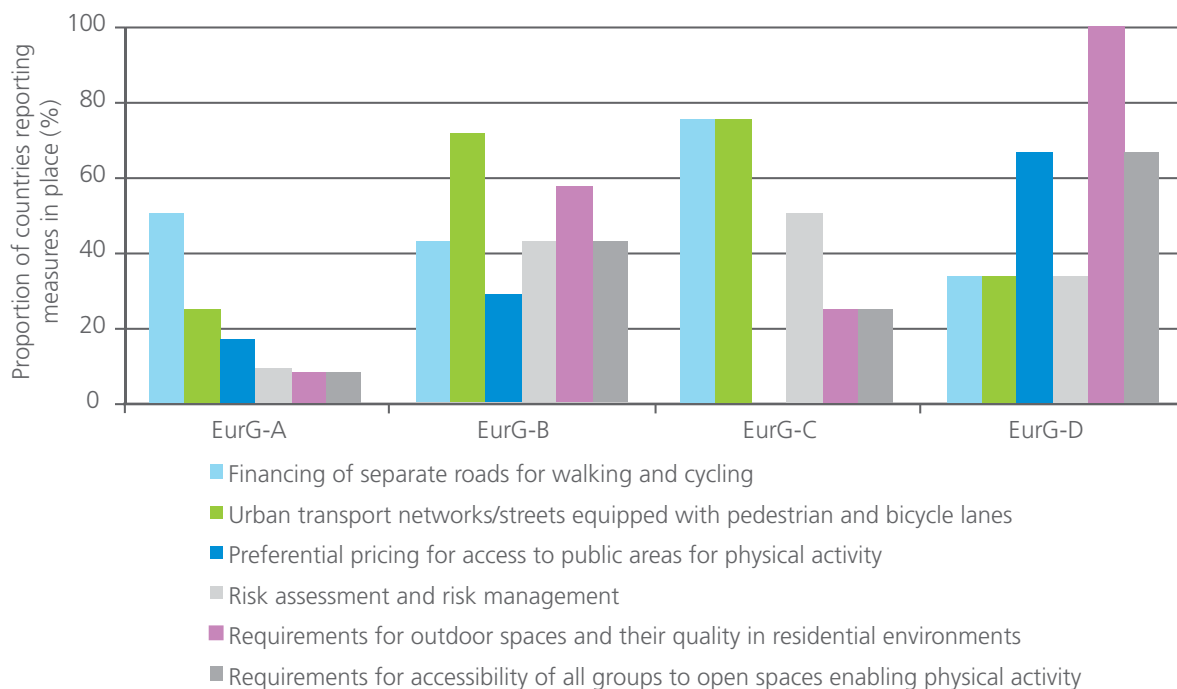
Looking in more detail at the national policy measures applied to prevent unintentional injuries and promote physical activity, some of the commonest measures under policies on injury prevention deal with children's safety. These measures include, for example, standards for playground equipment and water safety education (such as swimming lessons) in schools. As for injuries related to burns, several countries across the Region have building code requirements for, for example, smoke detectors or emergency fire staircases in place. Nevertheless, there is still scope to introduce relatively simple but less frequently used measures, such as pre-set temperatures for water taps. Product safety measures also generally seem to be well reflected, with the frequent application of warning labels and material and standards for design of playground equipment and landing surfaces. Further promotion would be needed to require mandatory first aid appointees in public buildings and companies in more countries.

Fig. 24. Types of unintentional injury covered by policy measures, by country grouping



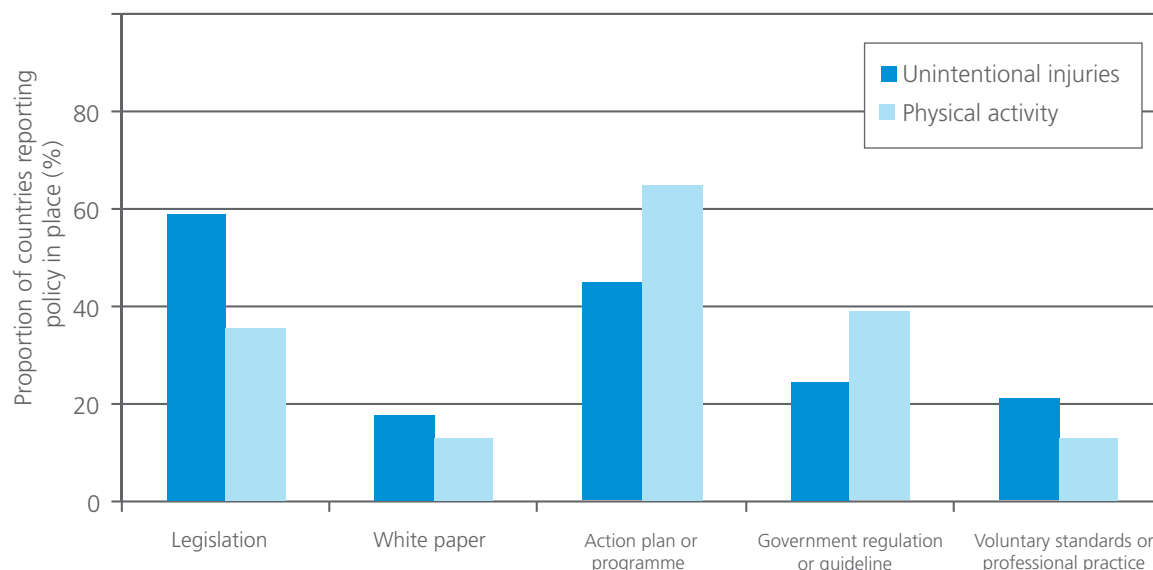
Where policy measure for promoting physical activity are concerned, many countries try to encourage the building of networks for cycling and walking either through a separation of paths for walking and cycling (EurG-A and EurG-C countries) or the development of urban transport networks or streets equipped with pedestrian and bicycle lanes (EurG-B and EurG-C countries). Countries in EurG-D mainly focus on the accessibility and quality of the available open and public spaces to promote activity. Solutions associated with the transport system do not play a major role in these countries (Fig. 25).

Fig. 25. Objectives of policy measures on physical activity, by country grouping



Compared to regional priority goal I and the outdoor air dimension in regional priority goal III, policy responses are less likely to involve legislation and more likely to use action programmes (Fig. 26), although legislative solutions are more likely to be used to prevent unintentional injuries. Action plans and programmes are typically used most frequently to promote physical activity, which is not surprising as promotion is seen as a key element in increasing the health benefits related to physically active lifestyles.

Fig. 26. Types of policy instrument used for tackling unintentional injuries and promoting physical activity



The scarcity of legally binding policy documents (and commitments) was also noted in a recent review of physical activity policies in Europe (26). Only 3 out of 49 documents included in that analysis were identified as legally binding. One possible explanation for the small number of such binding commitments is that when it comes to injuries and physical activity, the focus has traditionally been on measures to alter behaviour, such as information campaigns on how to be safe in the traffic or at home, or why physical activity is important. As noted above, however, the importance of environmental determinants for both injuries and physical activity has been highlighted in recent years. There is still room for improvement by developing policy measures focusing on the provision of adequate and supportive settings for mobility and activity (3,26,27).

Impact of international policy processes

Another partial explanation of differences between regional priority goals I, III and IV versus regional priority goal II is the absence of legally binding EU directives or laws, although there are a number of international initiatives which should influence national strategies. These include WHO's *Global strategy on diet, physical activity and health* (28), the *European strategy for the prevention and control of non-communicable diseases* (29) and the *European Charter on Counteracting Obesity* (30). The *EU Council Recommendation on the prevention of injury and promotion of safety*, adopted in 2007 (31), and the WHO European Region resolution EUR/RC55/R9 in 2005 on the prevention of injuries (32) have both provided a policy framework for action in Europe. At a global level, World Health Assembly resolution WHA57.10 on road safety and health (33) and United Nations resolution 60.5 (34) on improving road safety have both provided a stimulus for policy development. A compilation of consensus documents on health promotion, which among other things concern physical activity, has recently been published (35). In addition, online inventories have been established by the Regional Office that provide access to national policies on physical activity promotion (36) and injury prevention (37).

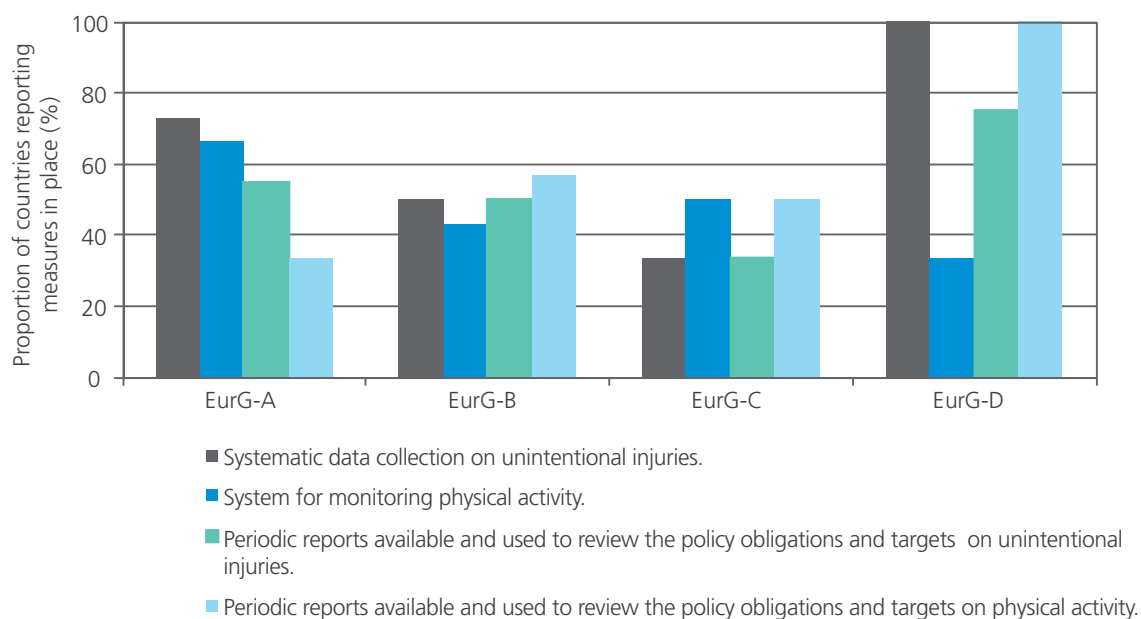
Healthy public policy

There is a great variance among the scores of the country groupings for policy accountability for health and health sector involvement (Fig. 23). The lower scores for health accountability in EurG-A and EurG-B countries are of especial concern. Since several countries within these groupings report a high prevalence of childhood obesity and overweight, there is a definite need to improve the accountability of the national policy frameworks for health consequences.

Policy evaluation and health accountability

Overall, every grouping (with the exception of EurG-C) reports having more monitoring and data collection systems in place for unintentional injuries than for physical activity. In EurG-A countries there is a higher emphasis on data collection than reporting, whereas in the EurG-D grouping a higher percentage of countries use periodic reports to review policy obligations and fewer report having a monitoring system in place for physical activity (Fig. 27). Without systematic monitoring, it is difficult to determine the effectiveness of periodic reports in these countries. On the other hand, countries with effective monitoring systems in place should focus more on using the data collected in these periodic reports.

Fig. 27. Monitoring systems and reporting practices on unintentional injuries and physical activity, by country grouping



Health sector involvement in intersectoral policy action

EurG-D and EurG-B countries report high levels of health sector involvement in policies on unintentional injuries (Fig. 23) which could be related to the large number of deaths resulting from drowning, falls, fire and poisoning they reported. As for physical activity, EurG-A countries score lower for health sector involvement compared to other groupings. As noted elsewhere, however, the health sector may not have the means or mandate to change this situation, other than to raise awareness and create demands for solutions on injury prevention and physical activity.

Equity considerations

The burden of unintentional injuries, excluding from road traffic, is very unevenly distributed among countries (Fig. 19) and shows a clear social gradient (38). This is especially true among younger people (children and adolescents in particular) and people in low- and middle-income countries, for whom

injuries as a cause of death and disability are increasing. This is in sharp contrast to downward trends in fatal injuries in countries with higher incomes (38). The clear need to address specific population groups with specific measures could be a potential reason for the quite good performance (compared to other regional priority goals) on the equity consideration dimension, as it may indicate that many countries have adopted policy measures and campaigns that focus on identified target groups. Only more detailed analysis can reveal to what extent such equity dimensions guide the development of policy and how effective they are in reducing inequities.

Transparency and communication

The provision of information is generally strong. This is the traditional approach for reducing unintentional injury and increasing physical activity, but information provision, by itself, generally does not motivate people to exercise more or change a risk-taking form of behaviour. Other measures, such as building local facilities for exercise, or safe areas separate from traffic, are of equal importance here (18). An information strategy needs to be combined with other measures such as neighbourhood programmes, legislation and regulations (39).

Overall progress

Overall, death rates from road traffic injuries have been falling consistently in the Region since the early 1990s, as have rates for the other leading causes of unintentional injuries. This illustrates a central message of this chapter, which is that unintentional injuries are preventable. The preventability of unintentional injuries highlights the unacceptability of the high, and sometimes even rising, rates still found in many countries.

Results from the Health Behaviour in School-aged Children study 2005/2006 show that, compared to 2001/2002, the proportion of young people engaging in moderate to vigorous physical activity generally increased in all three age groups examined (those aged 11, 13 and 15 years). It is not certain that this trend will continue, but the data do suggest that efforts to encourage physical activity can be successful. Now a central challenge is to figure out how to sustain activity as children get older. Trends in obesity are less promising and the impact of increased physical activity levels does not seem to be well-reflected in these figures. From 2001 to 2005, the proportion of overweight and obese young people increased in many countries for both boys and girls; only in three did it decrease.

Together, unintentional injuries, physical inactivity and obesity contribute significantly to the overall health burden in young people in the Region. These burdens are largely preventable but require sustained and integrated efforts in all countries across the health and non-health sectors aimed at improving the safety of home and leisure environments. Ensuring road safety has the health benefit of reducing death and injury while also promoting physical activity with its contribution to the prevention of obesity. Broader gains include a contribution towards the mitigation of climate change by encouraging alternative forms of transport than motor vehicles.

Both unintentional injuries and physical activity are increasingly seen as a public health issue, that is, as something that both policy-makers and communities could, and should, act on. This is manifested in the number of national action plans. There are also fairly good systems in place to follow both the incidence of injuries (although these mostly arise from road traffic incidents) and the number of overweight people in European countries. The significant challenge now is to ensure that action plans or government regulations are actually implemented and followed up, so that it can be determined if they work as intended or if adjustments are needed.

References

1. *Tackling injuries, the leading killers of children*. Copenhagen, WHO Regional Office for Europe, 2008 (Fact sheet, http://www.euro.who.int/Document/Mediacentre/FS_TacklingInjuries_Children.pdf, accessed 8 February 2010).
2. *Mortality in children and adolescents from unintentional injuries (falls, drowning, fires and poisoning)*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 2.2, www.euro.who.int/ENHIS, accessed 8 February 2010).
3. Sethi D et al. *European report on child injury prevention*. Copenhagen, WHO Regional Office for Europe, 2008 (http://www.who.int/Violence_injury_prevention/child/injury/world_report/European_report.pdf, accessed 11 February 2010).
4. *Mortality from road traffic injuries in children and young people*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 2.1, www.euro.who.int/ENHIS, accessed 8 February 2010).
5. Sethi D, Racioppi F, Mitis F. *Youth and road safety in Europe. Policy briefing*. Copenhagen, WHO Office for Europe, 2007.
6. Mortality indicators by 67 causes of death, age and sex (HFA-MDB) [online database]. Copenhagen, WHO Regional Office for Europe, 2009 (http://www.euro.who.int/InformationSources/Data/20011017_1, accessed 8 February 2010).
7. UNECE Statistical database [online database]. Geneva, United Nations Economic Commission for Europe, 2009 (<http://w3.unece.org/pxweb/DATABASE/STAT/Transport.stat.asp>, accessed 8 February 2010).
8. *Transport-related health effects with a particular focus on children*. Copenhagen WHO Regional Office for Europe and Geneva, United Nations Economic Commission for Europe, 2004 (<http://www.euro.who.int/Document/trt/PEPSynthesis.pdf>, accessed 8 February 2010).
9. *European status report on road safety: towards safer roads and healthier transport choices*. Copenhagen, WHO Regional Office for Europe, 2009 (<http://www.euro.who.int/Document/E92789.pdf>, accessed 8 February 2010).
10. *Transport safety performance in the EU: A statistical overview*. Brussels, European Transport Safety Council, 2003 (<http://www.etsc.eu/oldsite/statoverv.pdf>, accessed 8 February 2010).
11. European detailed mortality database (DMDB) [online database]. Copenhagen, WHO Regional Office for Europe, 2009 (http://www.euro.who.int/InformationSources/Data/20070615_2, accessed 8 February 2010).
12. Rogmans W. Les accidents domestiques et de loisirs des jeunes de moins de 25 ans dans l'Union Européenne : défis pour demain. *Santé Publique*, 2000, 12(3):283–298 (<http://sfsp.unice.fr/publications/2000/numero3/article2.pdf>, accessed 8 February 2010).
13. Sethi D et al. *Injuries and violence in Europe: why they matter and what can be done*. Copenhagen, WHO Office for Europe, 2006.
14. *Prevalence of overweight and obesity in children and adolescents*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 2.3, www.euro.who.int/ENHIS, accessed 8 February 2010).
15. Currie C et al., eds. *Inequalities in young people's health. Health Behaviour in School-aged Children: international report from the 2005/2006 survey*. Copenhagen, WHO Regional Office for Europe, 2008 (Health Policy for Children and Adolescents, No. 5, <http://www.euro.who.int/Document/E91416.pdf>, accessed 8 February 2010).
16. *Percentage of physically active children and adolescents*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet No. 2.4, www.euro.who.int/ENHIS, accessed 8 February 2010).
17. Woodcock J et al. Public health effects of strategies to reduce greenhouse gas emissions: urban land transport. *Lancet*, 2009, 374:1930–1943.
18. Schneider M-J. *Introduction to public health*. Gaithersburg, Md., Aspen Publishers, 2000.
19. Baker SP. Determinants of injury and opportunities for intervention. *American Journal of Epidemiology*, 1975, 101(2):98–102.
20. Pless IB. A brief history of injury and accident prevention publications. *Injury Prevention*, 2006, 12(2):65–66.
21. Korhakangas EE, Alahuhta MA, Laitinen JH. Barriers to regular exercise among adults at high risk or diagnosed with type 2 diabetes: a systematic review. *Health Promotion International*, 2009, 24(4):416–427.
22. Brownson RC et al. Environmental and policy determinants of physical activity in the United States. *American Journal of Public Health*, 2001, 91(12):1995–2003.
23. Clark CR et al. Perceived neighbourhood safety and incident mobility disability among elders: the hazards of poverty. *BMC Public Health*, 2009, 9:162.
24. Reynolds CC et al. The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature. *Environmental Health*, 2009, 8:47.
25. *Home and leisure injuries-related deaths in an enlarged European Union*. Saint-Maurice Cedex, Institut de veille sanitaire, 2008 (http://www.invs.sante.fr/publications/2008/anamort/home_leisure_plaq_anamort_m8_eng.pdf, accessed 8 February 2010).
26. Daugbjerg SB et al. Promotion of physical activity in the European Region: content analysis of 27 national policy documents. *Journal of Physical Activity and Health*, 2009, 6:805–817 (<http://www.euro.who.int/Document/E92956.pdf>, accessed 8 February 2010).
27. MacKay M, Vincenten J. *Child safety report card 2009: Europe summary for 24 countries*. Amsterdam, European Child Safety Alliance, Eurosafe, 2009.
28. *World Health Assembly resolution WHA57.17 on a global strategy on diet, physical activity and health*. Geneva, World Health Organization, 2004 (http://apps.who.int/gb/ebwha/pdf_files/WHA57/A57_R17-en.pdf, accessed 7 February 2010).
29. *Gaining health. The European strategy for the prevention and control of noncommunicable diseases*. Copenhagen, WHO Regional Office for Europe, 2006 (<http://www.euro.who.int/document/E89306.pdf>, accessed 7 February 2010).
30. *European Charter on Counteracting Obesity*. Copenhagen, WHO Regional Office for Europe, 2006 (EUR/06/5062700/8, <http://www.euro.who.int/document/e89567.pdf>, accessed 7 February 2010).
31. Council Recommendation on the prevention of injury and promotion of safety. Brussels, *Official Journal of the European Union*, July 18 2007, 2007/C 164/01 (CELEX-Nr. 32007H0718, <http://www.childsafetyeurope.org/csi/eurosafe2006.nsf/0/>

E17B57C7171C48C4C12572AC004F20DB/\$file/Injury%20recommendation%20consolidated%20text.pdf, accessed 7 February 2010).

32. WHO Regional Committee for Europe resolution EUR/RC55/R9 on the prevention of injuries in the WHO European Region. Copenhagen, WHO Regional Office for Europe, 2005 (http://www.euro.who.int/Governance/resolutions/2005/20050922_1, accessed 7 February 2010).

33. World Health Assembly resolution WHA57.10 on road safety and health. Geneva, World Health Organization, 2004 (http://apps.who.int/gb/ebwha/pdf_files/WHA57/A57_R10-en.pdf, accessed 7 February 2010).

34. United Nations General Assembly resolution 60.5 on improving global road safety. New York, United Nations, 2005 (<http://www.unece.org/trans/roadsafe/docs/A-RES-60-5e.pdf>, accessed 8 February 2010).

35. *Milestones in health promotion. Statements from global conferences*. Geneva, World Health Organization, 2009.

36. European network for the promotion of health-enhancing physical activity [web site]. Copenhagen, WHO Regional Office for Europe, 2010 (http://www.euro.who.int/hepa/projects/20060222_1, accessed 7 February 2010).

37. European inventory of national policies for the prevention of violence and injuries [web site]. Copenhagen, WHO Regional Office for Europe, 2010 (<http://data.euro.who.int/injuryprevention/>, accessed 7 February 2010).

38. Laflamme L et al. *Addressing the socioeconomic safety divide: a policy briefing*. Copenhagen, WHO Regional Office for Europe, 2009 (<http://www.euro.who.int/document/e92197.pdf>, accessed 8 February 2010).

39. Kamphuis CBM et al. Socioeconomic differences in lack of recreational walking among older adults: the role of neighbourhood and individual factors. *International Journal of Behavioral Nutrition and Physical Activity*, 2009, 6:1 (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2631001/>, accessed 8 February 2010).

Clean air for health

Regional priority goal III: *We aim to prevent and reduce respiratory disease due to outdoor and indoor air pollution, thereby contributing to a reduction in the frequency of asthmatic attacks, in order to ensure that children can live in an environment with clean air.*

Key messages

- The incidence of infant deaths from respiratory disease has been falling in most countries but is still significant (12% of infant deaths overall), particularly in the eastern part of the Region. Asthma and allergies are important and increasing causes of childhood illness.
- Air pollution, especially particulate matter, causes significant health problems throughout the Region, reducing life expectancy in more polluted areas by over one year.
- After substantial decreases in outdoor air pollution in most of the Region in the 1990s, progress in the last decade has been minimal.
- WHO guidelines and EU legislation form the basis for national policies on healthy air throughout Europe. They also drive new policy development, such as that related to second-hand tobacco smoke.
- Damp and mould are now established as major indoor air quality problems which disproportionately affect the health of disadvantaged populations. Although approaches to reduce and eliminate damp and mould from buildings exist, relevant public policies need to be strengthened.
- Even though regulations introducing spaces free of tobacco smoke have proved highly efficient in reducing the health impacts of tobacco, they have yet to be introduced or developed in large parts of the Region.

Clean air and its public health significance – new insights

Knowledge about the links between health and air quality has significantly advanced in the last two decades. There is more evidence about the role of pollutants in the aetiology of respiratory diseases and new insights have been gained into the impacts of fine particulate matter on cardiovascular health. Hundreds of studies throughout the world confirm the association of mortality, or hospital admissions, with levels of the most common urban air pollutants. The results of this research, combined with data on air quality in Europe, indicate that the pollution of air with fine particulate matter leads to a nine-month shortening of life expectancy in Europe. New studies among children indicate that exposure not only increases the prevalence of respiratory symptoms but also raises the incidence of new respiratory diseases (1). New studies also indicate substantial gains in public health resulting from improvements in air quality, for example, the attribution of 15% of the overall increase in life expectancy to the reduction of fine particulate matter in the United States (2). This evidence has been reviewed and summarized by WHO in the updated *Air quality guidelines* (3), and is being used to design new approaches and regulations to reduce the health risks of pollution.

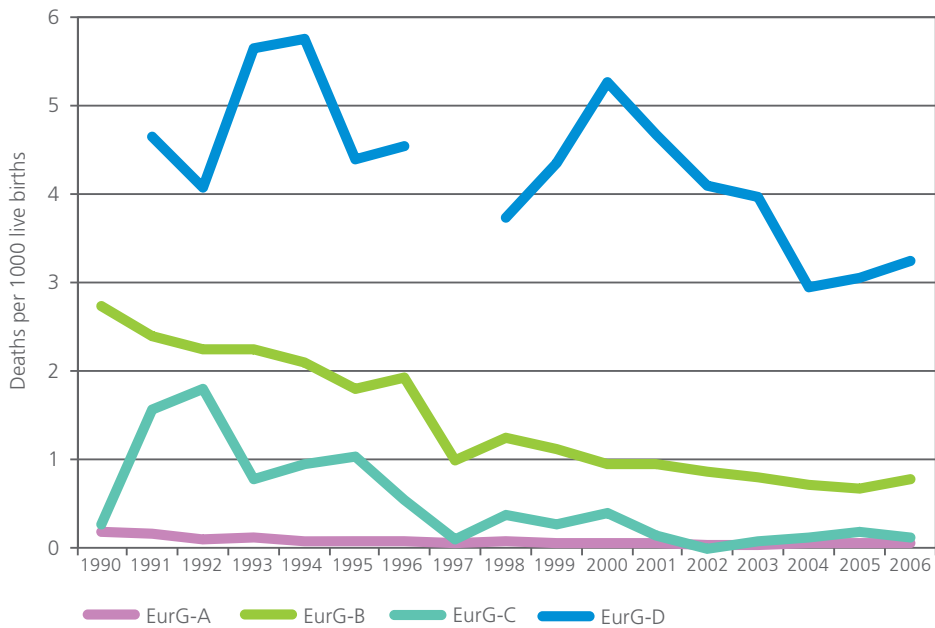
New evidence is also accumulating on the burden of disease due to indoor air pollution. The risks to health of exposure to second-hand tobacco smoke have been widely recognized and are reflected by widespread programmes to eliminate tobacco smoke from indoor spaces. Other hazards common in indoor air, such as biological contaminants arising from damp and mould, have been well characterized by the newly published *WHO Guidelines for indoor air quality – dampness and mould* (4). An understanding of these links is an essential element of action to reduce the burden of disease and to benefit public health.

Considering this new research information, this chapter reviews the background patterns of diseases affected by common air pollutants, presents the distribution and trends in exposure in European populations, and characterizes the inherent risks and the opportunities for their reduction.

The burden of respiratory disease

The rates of infant death from respiratory disease have fallen in all sub-regions (Fig. 28) and in nearly all countries since the mid- to late-1990s (5). Present rates still, however, account for over 12% of total infant deaths, a substantial burden.

Fig. 28. Average post-neonatal death rates from respiratory diseases (per 1000 live births)

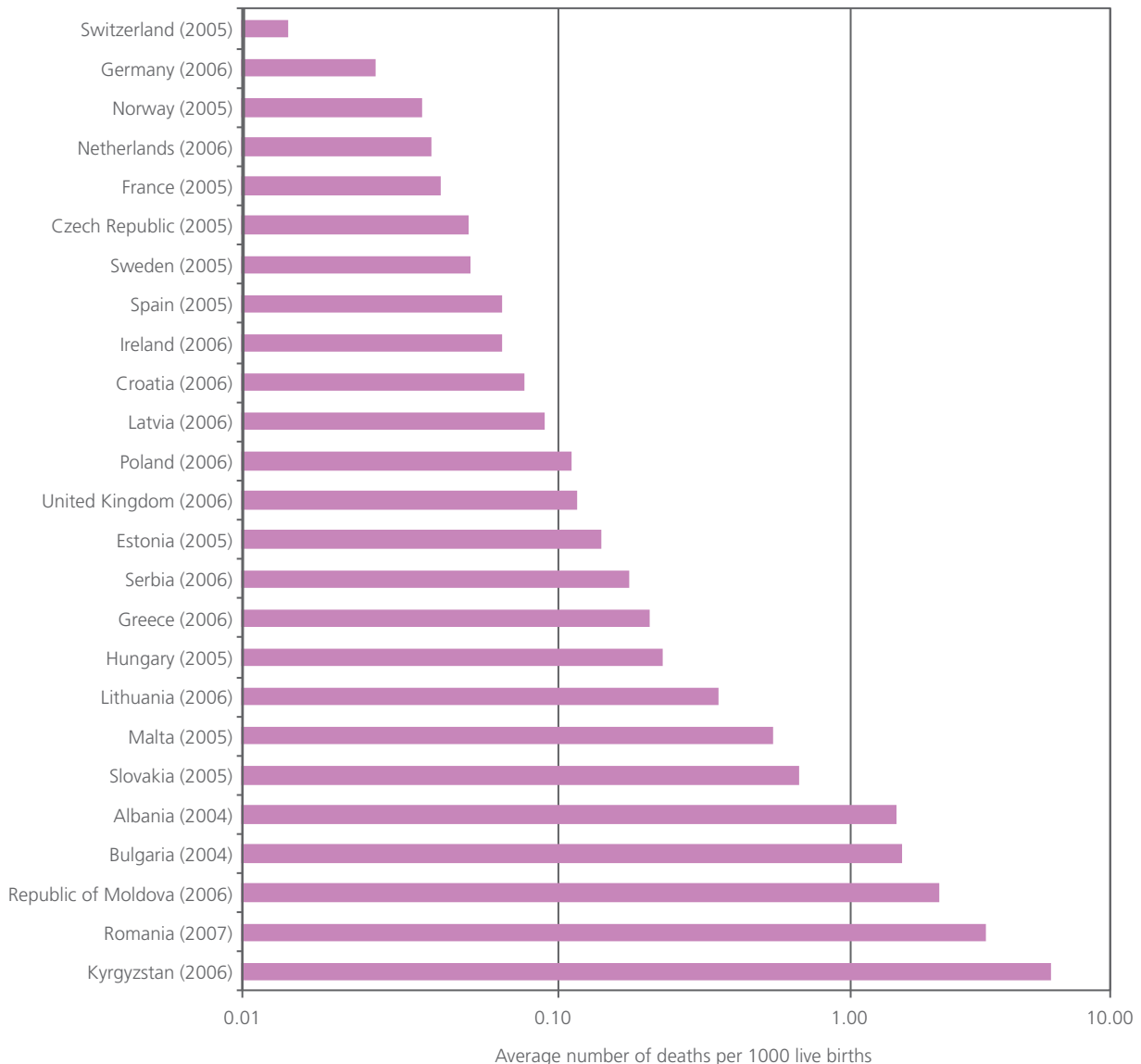


Note. For EurG-A n=15, for EurG-B n=10, for EurG-C n=4, for EurG-D n=2.
 Not all countries supplied data in all years.
 Source: WHO mortality database (6) and WHO European health for all database (7).

There are considerable variations across the Region, with a gradual increase in the death rate from west to east (Fig. 29) (5). The poorer economic and environmental situation in eastern Europe contributes to the higher rates seen in that part of the Region. Several countries have virtually eliminated respiratory diseases as a cause of post-neonatal death, indicating the huge potential for further reductions in other countries.

There are significant differences in the causes of respiratory infections between various regions of Europe: bacterial infections are common in developing countries while viral infections cause most acute lower respiratory infections in developed countries (5). In temperate European countries, there is a marked seasonal variation in acute lower respiratory infections, with a significant rise in incidence in winter months falling to relatively low levels in summer.

Fig. 29. Post-neonatal infant death rates due to respiratory diseases in 25 WHO European Member States, 2004–2007^a



^a In Austria, Finland, Luxembourg and Slovenia, reported mortality is 0.
 Source: WHO mortality database (6) and WHO European health for all database (7).

There is now substantial evidence concerning the adverse effects of air pollution on pregnancy outcomes and infant death (8). This is sufficient to infer a causal relationship between particulate air pollution and respiratory deaths in the post-neonatal period, as well as with adverse effects on the development of lung function. An increased incidence can be inferred of upper and lower respiratory symptoms (many of which are likely to be symptoms of infection) due to exposure. Older children are also adversely affected by air pollution, and their susceptibility needs to be considered when air pollution regulations are developed.

The effects are attributed to various combustion-related outdoor air pollutants as well as poor indoor air quality, arising in particular from dampness and mould, the use of solid fuel for cooking and heating, tobacco smoke, infectious agents and allergens.

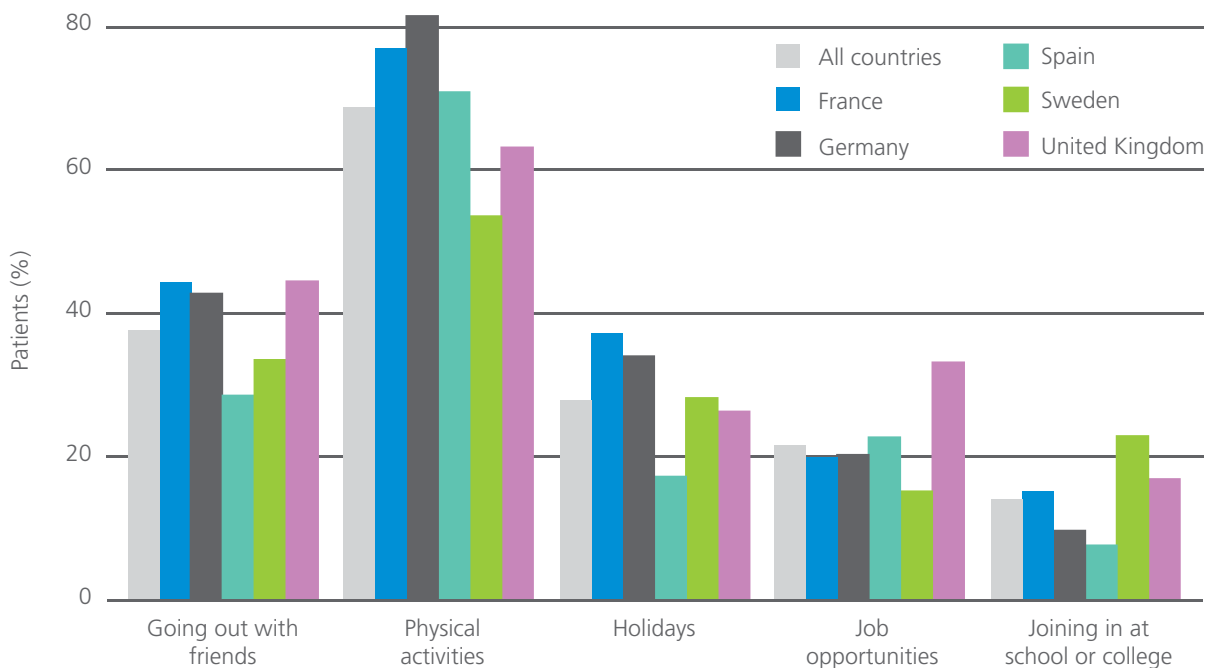
Air pollution is also associated with chronic respiratory diseases, which often begin in childhood (9).

Two important chronic respiratory diseases are asthma and allergic rhinoconjunctivitis⁶. Globally the prevalence of asthma and allergies has increased over the last few decades (9). Asthma has become the commonest chronic disease in children and is one of the major causes of hospitalization for those aged under 15 years. The increasing prevalence of allergic diseases in children throughout Europe is no longer restricted to specific seasons or environments. The greatest increases are generally seen in urban areas (9).

Between 1999 and 2004, asthma prevalence rates in Europe ranged from approximately 5% to 20% in children aged 6–7 years and from approximately 5% to 25% in children aged 13–14 years. Allergic rhinoconjunctivitis shows slightly less variation, with a prevalence of approximately 5% to 10% in children aged 6–7 years and from approximately 5% to 20% in children aged 13–14 years (10). The rates tended to be higher in older children for both asthma and allergies, and wide within-country ranges were often seen in those countries where sufficient data were available. Overall, the correlation between the prevalence of these two conditions was high.

Asthma symptoms adversely affect young patients in a number of ways, including schoolwork and social activities (Fig. 30). Early diagnosis and appropriate treatment is vital, as this leads to much better disease control and outcomes (9). Good management of asthma and allergies, for example by reducing the level of exposure to common risk factors and providing appropriate medication, can control the disorder and enable people to enjoy a high quality of life.

Fig. 30 Effects of asthma on patients in EU countries, 2005



Source: WHO (9).

There is a complex interaction between genetic and environmental factors in the development of both asthma and allergies (10). There is evidence of a causal relationship between exposure to air pollution and exacerbation of asthma, mainly due to exposure to particulate matter and ozone. The incidence of allergic symptoms in children is associated with exposure to allergens in indoor environments, including smoke from fires, damp and mould, dust mites, allergens from pets and second-hand tobacco smoke.

⁶ Asthma is an inflammatory disorder of the bronchial airways produced by allergies, viral respiratory infections and airborne irritants. Allergic rhinoconjunctivitis is characterized by sneezing, nasal congestion and irritation of the nose, eyes or throat.

Children who are more frequently exposed to poor indoor air may subsequently be at greater risk of being affected by outdoor pollutants. Other factors that may influence the rates of asthma and allergies include lifestyle, dietary habits, socioeconomic status and climatic factors.

Asthma continues to affect many individuals into adulthood, meaning that the prevalence of asthma in adults is also high. Not all chronic respiratory diseases start in childhood, however. Chronic lung diseases that cause limitations in lung airflow (often collectively referred to as chronic obstructive pulmonary disease) tend to begin in mid-life. Although mortality from these diseases is falling in the Region, it still causes 4% of all deaths and contributes to 5% of the overall burden of disease (11). Globally, their burden is increasing and, should current trends persist, they are projected to become the third leading cause of death by 2030 (12). Currently, the most important risk factors for chronic obstructive pulmonary disease are tobacco-smoking, indoor and outdoor air pollution, and occupational exposure to dusts and chemicals.

It has only become fully apparent in the last decade that air pollution, especially of fine particulates, plays a major role in cardiovascular disease. Over half (52%) of deaths, and 23% of the overall burden of disease in the Region, arises from cardiovascular disease. Even relatively small increases in the risk of cardiovascular disease will translate into huge absolute numbers of additional people suffering more severely from the disease.

Outdoor air pollution and its impact on health in Europe

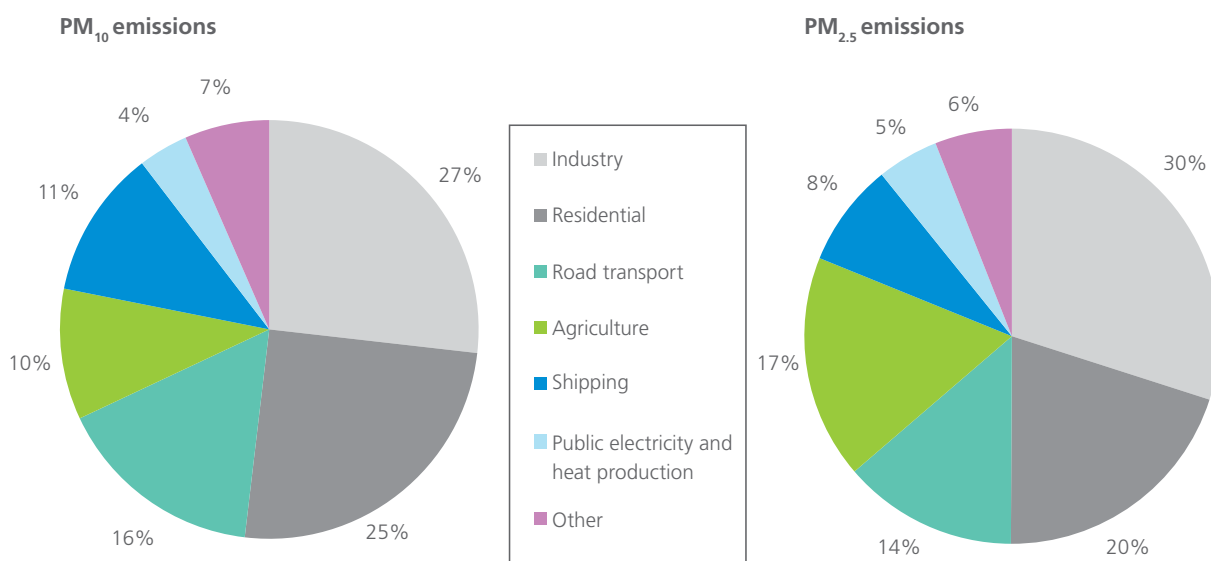
Various outdoor air pollutants affect health. The impacts of the two widespread pollutants evaluated here, particulate matter and ozone, are the best known but other pollutants (volatile organic compounds, nitrogen oxide, sulfur oxide, etc.) should also be considered for policy action.

Large amounts of **particulate matter** (PM) are generated by various human activities (Fig. 31). Since particles can travel hundreds and thousands of kilometres in the air, and are partly created from gaseous pollutants in the atmosphere, their effects can be seen far from the source. PM consists of solid and liquid particles that vary in their physical and chemical properties and that are classified by particle diameter (in micrometres – μm). When inhaled, PM_{10} particles (with a diameter of less than 10 μm) penetrate deep into the respiratory system. Finer particles (with a diameter of less than 2.5 μm) then go on to penetrate the lungs and pass into the bloodstream and are carried into other body organs. Concerned that these particles cause a wide range of health impacts, WHO has developed guidelines addressing their risks (Table 3).

Long-term average exposure to PM is associated with both the risks of chronic effects on children's health, such as impaired development of lung function, and the frequency of acute effects, such as the aggravation of asthma or incidence of respiratory symptoms (14). Very young children, including unborn babies, are particularly sensitive to air pollutants. Exposure to PM is also associated with increased hospital admissions and mortality in adults (11, 14). The risk increases linearly with the concentration of pollution, and there is no evidence to suggest a threshold for PM below which no adverse health effects would occur.

Data from 2007 demonstrate that there are important disparities in PM_{10} exposure in the Region (Fig. 32): average country levels varied from 16 $\mu\text{g}/\text{m}^3$ (Finland and Ireland) to 45–52 $\mu\text{g}/\text{m}^3$ (Bulgaria, Romania and Serbia) and 72 $\mu\text{g}/\text{m}^3$ in Turkey. Within-country differences were also substantial. In total, over 92% of the urban population for which PM_{10} data are available live in cities where the WHO air quality guideline for PM_{10} is exceeded.

Fig. 31. Contribution of key sectors to emission of PM in the EU27, 2007



Source: European Environment Agency (13).

Table 3. WHO air quality guidelines for particulate matter

	Annual average	24-hour mean (not to be exceeded >3 days/year)
PM_{2.5}	10 µg/m ³	25 µg/m ³
PM₁₀	20 µg/m ³	50 µg/m ³

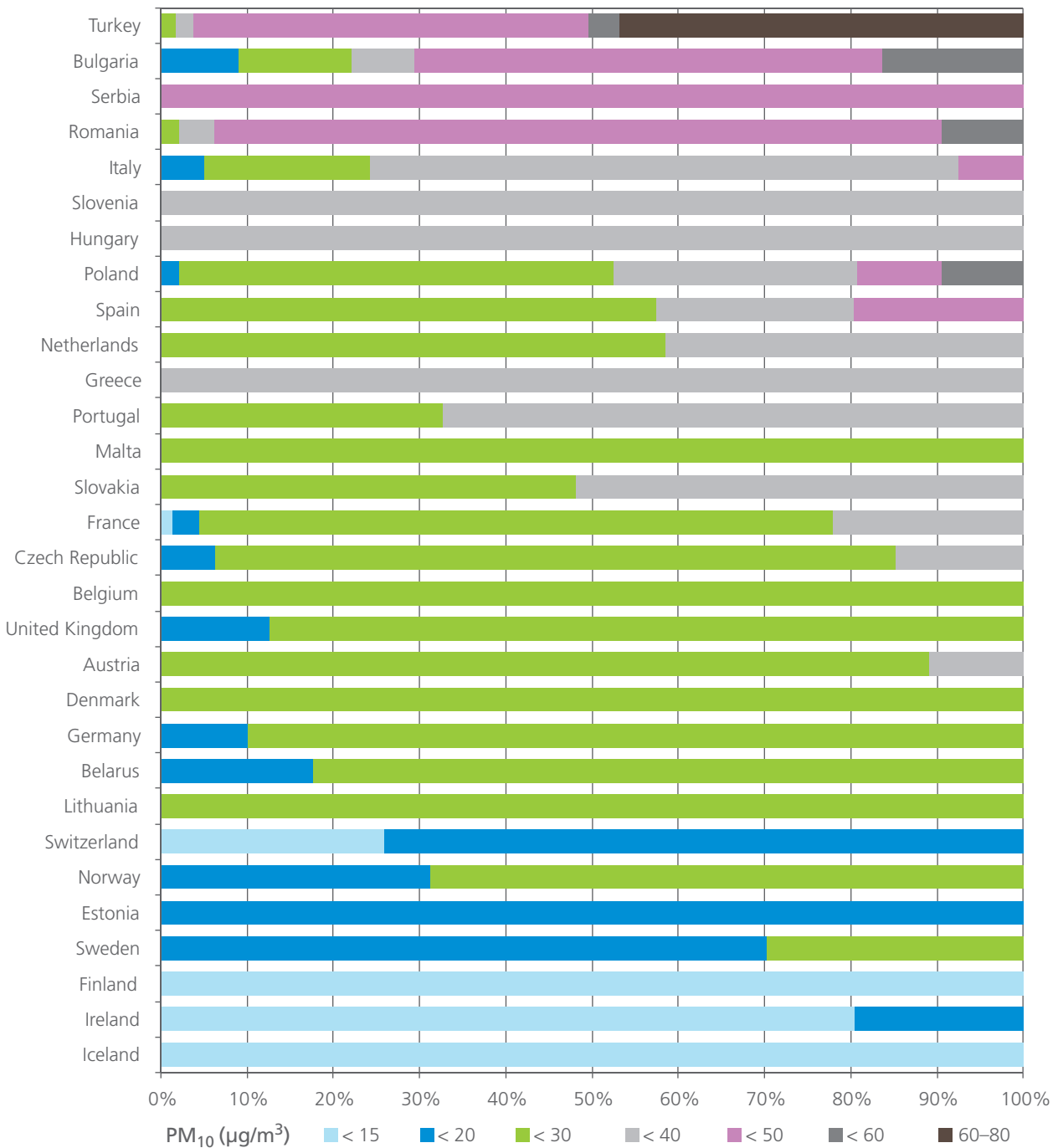
Overall, the regional average of urban PM₁₀ did not change substantially in the period 1997–2007 (Fig. 33). Concentrations of another common urban air pollutant, nitrogen dioxide, fell more consistently, but the reduction was small. This contrasts with the pronounced downward trend evident for sulfur dioxide, indicating that policies aimed at the reduction of sulfur emissions have been more effective than those addressing PM or nitrogen emissions.

WHO's analysis, based on data from the late 1990s, indicates that throughout the Region around 700 deaths from acute respiratory infections can be attributed to PM₁₀ exposure annually in children aged 0–4 years (14). Quantifying the effects of PM exposure on illness is more difficult, but a reduction of PM₁₀ exposure to 20 µg/m³ could be associated with a 7% decrease in the incidence of coughs and lower respiratory symptoms and a 2% decrease in respiratory-related hospital admissions in children aged under 15 years. A decrease to 10 µg/m³ is expected to reduce the number of days that children aged 5–14 years suffer lower respiratory symptoms (wheezing, chest tightness, shortness of breath and coughs) by 1.9 days per year per child.

Estimates of the health burden from PM exposure in adults are dominated by the increase in the risk of mortality due to long-term exposure to fine PM_{2.5}. People in Europe are generally unaware of the life-shortening consequences, for them, of air pollution. Current exposure to PM from anthropogenic sources leads to the loss of 8.6 months of life expectancy in Europe – from around 3 months in Finland

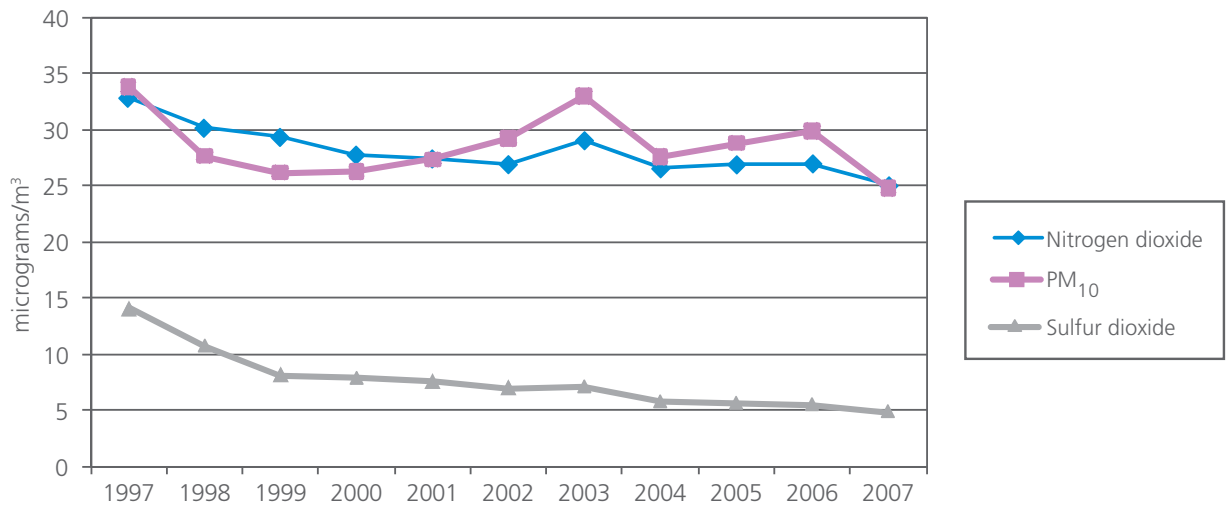
to more than 13 months in Belgium (14). The most recent estimates of impacts of PM on mortality, based on PM₁₀ and PM_{2.5} monitoring data in 40 European countries, indicate that close to 500 000 deaths per year are accelerated due to exposure to ambient PM in those countries. The distribution of these deaths is mapped in Fig. 34. It is important to note that there is no information on PM levels in many parts of the Region, mainly in the east and including the newly independent states, but approximate estimates for these countries suggest that the burden of disease related to PM exposure will be considerable.

Fig. 32. Percentage of urban population exposed to various annual average PM₁₀ levels in countries with PM₁₀ data, 2007



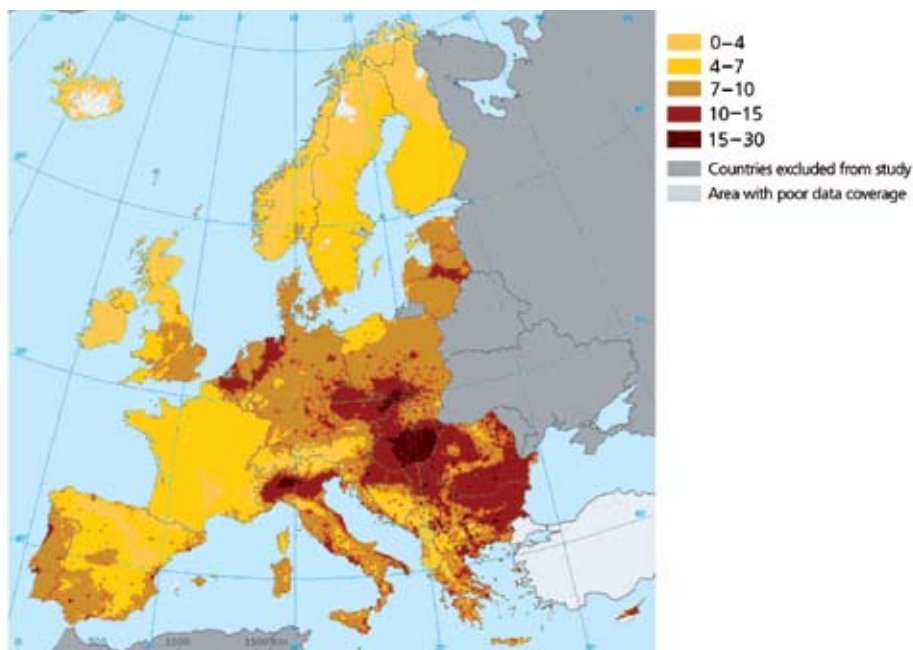
Source: AirBase (15), except for Belarus and Turkey whose national sources supplied data directly to WHO.

Fig. 33. Annual average concentrations of PM₁₀, nitrogen dioxide and sulfur dioxide monitored in urban background locations, 1997-2007



Source: AirBase (15).

Fig. 34. Premature deaths attributed to PM_{2.5}, 2005 (attributable annual mortality per 10 000 people)



Source: Barrett K et al. (16).

A significant reduction in PM to around 50% of current levels could be achieved if all currently technically feasible emission reduction measures were implemented (the maximum feasible reduction scenario) (14). Although PM₁₀ monitoring data from the 1990s are very scarce in Europe, they do indicate that in the previous decade a significant reduction in pollution has been achieved. For example, mean PM₁₀ measured in United Kingdom cities fell from approximately 36 µg/m³ at the beginning of the 1990s to 23 µg/m³ by 2000.

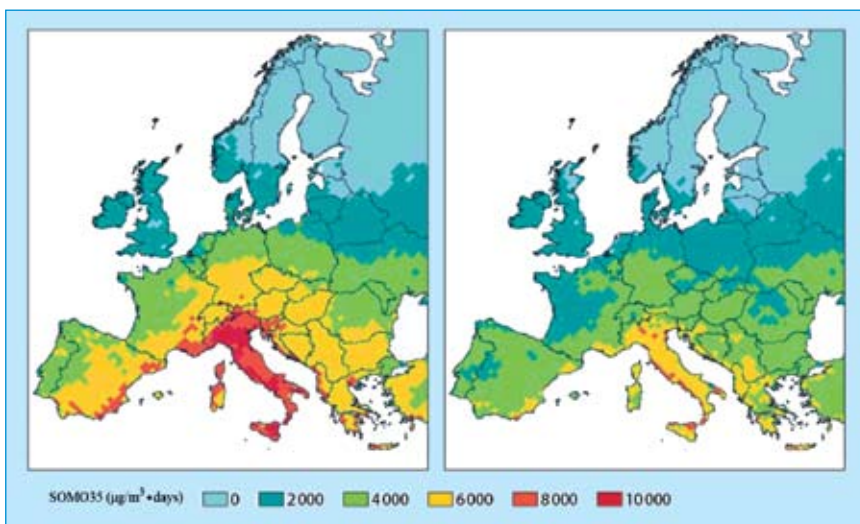
Ozone is another outdoor air pollutant that causes substantial deaths and illness in the Region. Ozone in lower levels of the atmosphere originates largely from human activity and is not only harmful to

humans but has adverse effects on materials and vegetation. It is also a greenhouse gas when in the upper troposphere. Children may be more exposed than adults because of their higher rate of physical activity, the greater amount of time they spend outside and their higher metabolic rate.

Ozone is linked to a number of health problems. Short-term exposure can increase respiratory deaths and the incidence of respiratory symptoms. The consequences of long-term exposure are less well-established but suggestive evidence points to further negative effects (17).

Despite indications of decreasing frequency of days with high ozone concentrations across much of Europe, ozone continues to contribute substantially to regional health burdens. High ozone concentrations (above 70 $\mu\text{g}/\text{m}^3$) are associated with approximately 21 000 deaths and 14 000 respiratory hospital admissions annually in the member states of the EU since 2004 (EU25) (17). The risk is proportional to the indicator which gives the value of the sum of the daily maximum eight-hour mean over 35 parts per billion (SOMO35), presented in Fig. 35 for current O_3 levels modelled for 2000 and 2020. High ozone levels aggravate respiratory conditions, with the magnitude of the impact in the range of 8–108 million person-days annually in EU countries (17).

Fig. 35. Model estimates of rural ozone concentrations expressed as SOMO35 for 2000 (left) and 2020 (right)^a



^a Risks to health are expected to be proportional to SOMO35.

Source: WHO Regional Office for Europe (17).

Current policies are only expected to reduce ozone-related mortality by about 1000 deaths or fewer (17). Reductions in illness are expected to be greater, with particular benefits in the reduction of cough and lower respiratory symptoms in children (by an estimated 40%). Implementation of all technically feasible pollution reduction measures would, however, halve the current mortality by 2020 (17).

Exposure to indoor air pollution

Second-hand tobacco smoke

Children and adolescents (as well as adults) can be exposed to tobacco smoke indirectly through second-hand tobacco smoke (SHS), which is defined as the involuntary or passive breathing of air contaminated with tobacco smoke by someone who is not smoking. SHS is the dominant form of indoor air pollution in spaces where tobacco is smoked, even where areas are properly ventilated.

Tobacco-smoking accounts for approximately 30% of all cancer deaths in the general population as well as for a substantial proportion of cardiovascular and respiratory disease (18,19). It is also well-

established that exposure to SHS creates a huge burden to health. The most recent calculations indicate that more than 72 000 people in the EU25 alone die each year due to exposure to SHS in the home (20). In addition to exposure at home, workplace exposure to SHS is also linked to an increased risk of death. In the EU in 2008, 6000 deaths were attributable to SHS in offices, bars and restaurants, 40% of which were in non-smoking staff. These estimates do not include the health burden of customers (20). The burden of illness related to exposure to SHS in public places can be greatly reduced by smoking bans. A recent study analysing acute coronary events in Italy before and after the implementation of the smoking ban in January 2005 found a statistically significant reduction in acute coronary events, amounting to as much as approximately 11% in people aged 35–64 years and approximately 8% in those aged 65–74 years (21).

In infants and young children, exposure to SHS increases the risk of sudden infant death syndrome, acute lower respiratory tract infections, chronic respiratory symptoms, middle ear disease, reduced pulmonary function and asthma (19). There is also some evidence that exposure to SHS during childhood may cause lymphoma and brain tumours (19). Studies in the Region have attributed 25% of all sudden infant death syndrome deaths to SHS and indicate that SHS increases the number of asthma episodes by 6–10%, depending on the underlying smoking prevalence (19). As a recognized human carcinogen, no level of SHS exposure is considered free of risk.

Recent estimates of children's exposure to SHS come from the Global Youth Tobacco Survey (GYTS), conducted among young people aged 13–15 years living in countries of central and eastern Europe, central Asia, the Caucasus and the Balkans (22). According to this study, the proportion of 13–15-year-olds exposed to SHS at home ranged from 37% (in the Czech Republic) to over 90% (in Armenia, the Balkan countries and Georgia), while exposure to SHS outside the home was comparatively higher, ranging from 65% to 96% (19) (Fig. 36). Even in countries with relatively low levels of exposure in the home, exposure outside the home is comparatively high. For western Europe, various studies from the late 1990s indicated that the proportion of children aged 0–4 years exposed to SHS at home lay between 20% (Netherlands) and 35% (England), with higher levels often seen in older children (19).

Unlike some other public health hazards, exposure to SHS is easily preventable. A number of countries worldwide have implemented various forms of smoke-free policies, and research shows that these policies are successful. Smoke-free policies have led to dramatic decreases in exposure to SHS (up to 90% in low-exposure settings) as well as decreases in daily cigarette consumption and in smoking by young people (23).

Exposure to products of indoor combustion

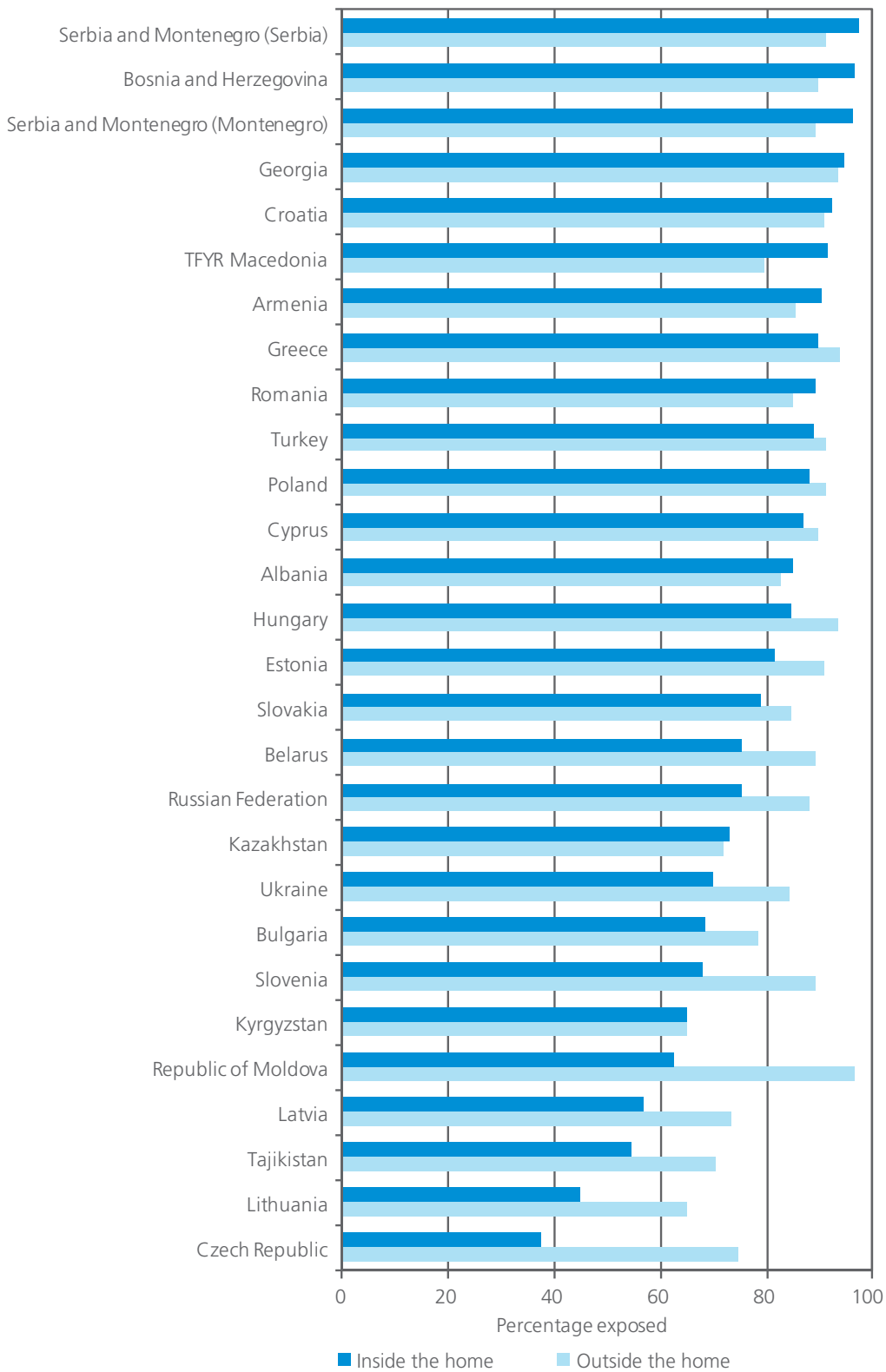
Cooking and heating with solid fuels, such as dung, wood, agricultural residues, grass, straw, charcoal and coal, is a major source of indoor air pollution. Combustion of such fuels emits a number of different pollutants, but the smallest particles, with a diameter of 2.5 µm or less, appear to have the greatest health-damaging potential. Women and young children, who spend most of their time in the home, are particularly vulnerable. Globally, 52% of the 1.6 million annual deaths related to indoor air pollution in children aged 0–4 years are from the use of solid fuels (24).

There is consistent evidence that exposure to indoor air pollution from indoor combustion increases the risk of pneumonia, chronic respiratory disease and lung cancer. There is also some evidence for associations with asthma, cataracts, tuberculosis, adverse pregnancy outcomes, ischemic heart disease and cancers of the nose and throat (24). The risks depend partly on the age of those exposed.

The use of solid fuel for cooking in homes in 25 countries of the Region in 2005 for which data were available ranged from just above 0% to almost 50% (Fig. 37) (24). Many central Asian countries, where solid fuel is quite frequently used, have recorded substantial drops compared to previous estimates.

Another characteristic of the use of solid fuel is that in virtually all countries, the proportion of children exposed in rural areas is many times higher than in cities; in some countries, nearly all the exposure is in rural populations.

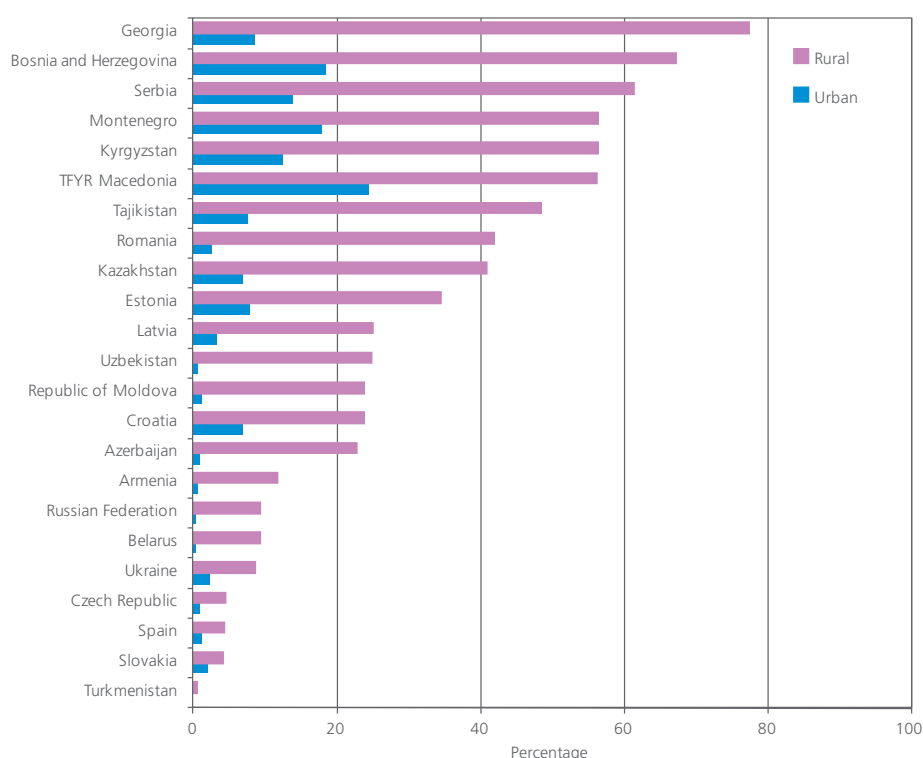
Fig. 36. Proportion of 13–15-year-olds exposed to SHS inside and outside the home, 2002–2007



TFYR Macedonia = the former Yugoslav Republic of Macedonia.
 Source: Global Youth Tobacco Survey (GYTS) [web site] (22).

Within the Region, the burden of disease attributable to risk factors related to the use of solid fuel is extremely unequally distributed. The highest burden of respiratory illness in children aged 0–4 years occurs in *EurB* countries,⁷ both in terms of mortality and illness (Table 4) (24). These estimates should, however, be interpreted with caution owing to the scarcity of household-level data on use of solid fuels in the other regions.

Fig. 37. Percentages of children aged 0–14 years living in homes using solid fuels for cooking, WHO European Region, 2005



Notes: TFYR Macedonia = the former Yugoslav Republic of Macedonia.

Data for Azerbaijan, Kazakhstan, Kyrgyzstan and Uzbekistan are for 2006; data for Croatia, the Czech Republic, Estonia, Georgia, Latvia, Slovakia, Slovenia and Spain are for 2003; data for Romania are for 2002; data for Turkey are for 1999; data for Turkmenistan are for 2000; data for Ukraine are for 2007.

Source: UNICEF (25), Measure DHS (26), WHO (27).

Table 4. Mortality and morbidity attributable to cooking with solid fuels in children aged 0–4 years, WHO European Region, 2006

WHO epidemiological subregion	Burden of disease study, 2006	
	Deaths ('000)	DALYs ('000)
<i>EurA</i>	0	0
<i>EurB</i>	11.6	319
<i>EurC</i>	<1	12.5

Moving to cleaner fuels or combustion technologies is the preferred way of preventing the health effects of exposure to the products of indoor combustion. Such a move increases energy efficiency and is often consistent with approaches to reduce greenhouse gas emissions and ambient air pollution.

7 Global Burden of Disease classification of countries. Atlas of health in Europe, 2nd ed. Copenhagen, WHO Regional Office for Europe, 2008 (<http://www.euro.who.int/document/e91713.pdf>, accessed 10 February 2010).

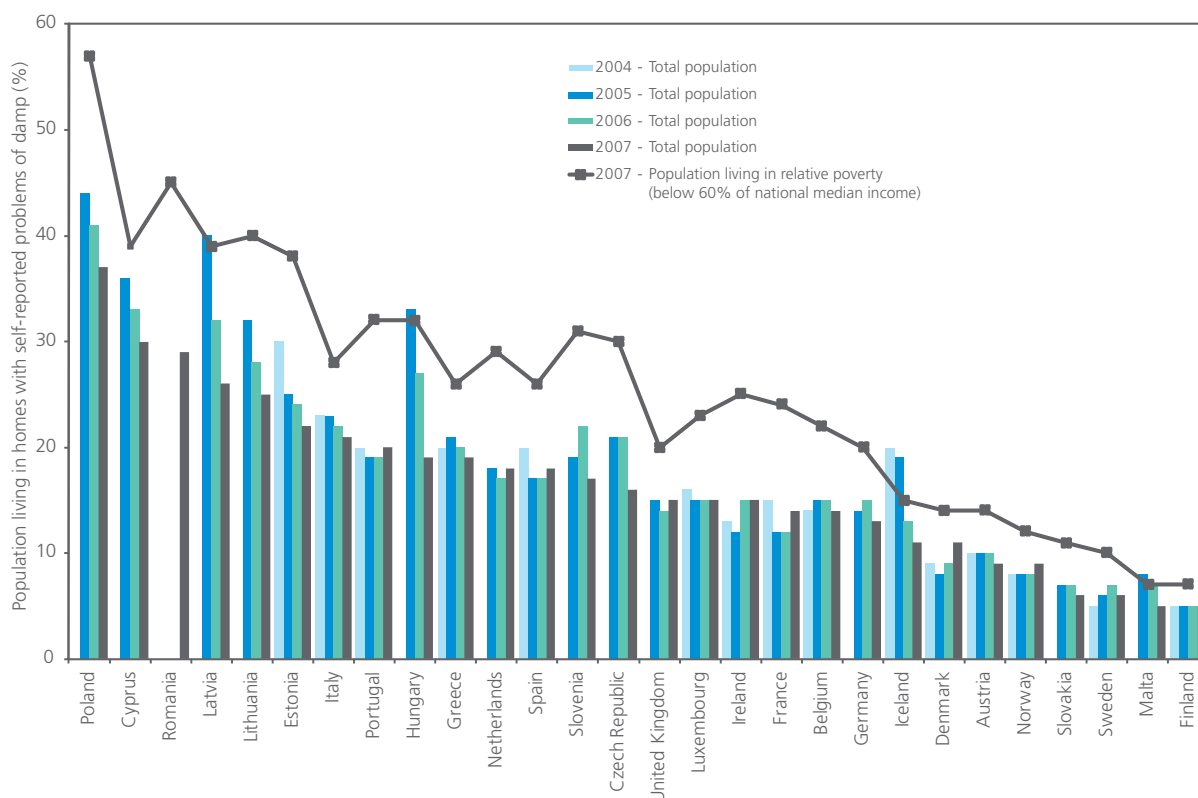
Exposure to damp

Exposure to damp in the home and to biological contaminants in indoor air arising from dampness is a strong and consistent indicator of risk for a number of respiratory illnesses, including asthma and respiratory symptoms such as cough and wheeze (28). Dampness facilitates the growth of moulds, fungi and bacteria which emit spores, cells, fragments and volatile organic compounds into the indoor air. Moreover, dampness initiates chemical and/or biological degradation of materials, which also causes indoor air pollution. Exposure to microbial contaminants is clinically associated with respiratory symptoms, allergies, asthma and immunological reactions. The risk of a range of respiratory symptoms increases by approximately 50% among the residents of homes suffering from damp. Accordingly, WHO recently released the first *Indoor air quality guidelines – dampness and mould* (4).

European survey data indicate that exposure to damp is a frequent health risk, with 18% of the EU population exposed in 2007 (vs. 19% in 2005 and 18% in 2006) (Fig. 38) (28). Exposure varies greatly among countries, however, ranging in 2007 between 5% and 37%. Damp houses are especially frequent in the new EU member states, although many of these also show a notable decrease in exposure over recent years.

International comparisons are difficult with current survey data, so analysis has to focus on national trends. The capacity for international comparisons would be enhanced if procedures for data collection were standardized.

Fig. 38. Proportion of total population living in homes with self-reported problems of damp, 2004–2007, and proportion of population in relative poverty living in homes with self-reported problems of damp, 2007



Source: WHO Regional Office for Europe (28); European Union (29).

The number of household members, activities such as cooking, laundering and bathing, the use of certain fuels for energy, indoor temperature, amount of insulation, climate, housing characteristics and especially the degree of ventilation all affect the amount of water vapour in indoor air. As is to be expected, poorer population groups are more likely to live in homes with problems of damp in every country surveyed (Fig. 38) (28).

Dampness and condensation are connected to other housing quality indicators, and the rehabilitation of housing stock would go a long way towards reducing exposure to indoor air pollution as well as improving other aspects of quality of life. A focus on damp in the homes of poorer residents may yield the greatest health gains. Case studies from around Europe have demonstrated that there are a number of fairly straightforward ways of reducing exposure to damp and mould, which can be successful in a variety of climates (30) (Box 1).

Box 1. Two examples of successful programmes to reduce exposure to indoor pollutants

Mechanical ventilation in Sweden

In Sweden, a country with a relatively cold climate, the impact of mechanical ventilation on indoor humidity, mite allergens and volatile organic compounds in 59 single-family dwellings has recently been assessed. Mechanical ventilation reduced exposure to all three indoor air health risks compared with natural ventilation. National and municipal programmes have been put in place in Sweden based on these findings.

Building standards in Israel

Israel, a country with a Mediterranean climate, passed a national thermal insulation standard in 1985 aimed at reducing the risk of surface condensation in dwellings. After implementation of the standard, the proportion of homes with condensation-related mould decreased by 25% and those with extreme mould growth by 20%. The enforcement of the standard created a change in the building market that led to improved building products and to better insulation in new buildings.

Source: WHO Regional Office for Europe (30).

Synergies between climate change mitigation and cleaning the air

There are many links between air pollution, factors affecting the climate and health. The main greenhouse gases (carbon dioxide, methane) are emitted in the same processes that produce air pollutants hazardous to health. Many air pollutants of health concern, such as fine particles or ozone, affect climate directly. On the other hand, air pollutants are often modified by climatic factors (such as temperature and precipitation). For example, temperature modifies the chemical reactions that synthesize ozone, while wind modifies the long-range dispersion of PM. Climatic conditions, such as precipitation or flooding, modify the growth of mould and bacteria and these changes affect the spatial and temporal distribution of allergenic plants. There is growing recognition of the synergies, gains in efficiency and co-benefits of integrated policies and action to mitigate climate change and to alleviate health problems. To achieve the greatest health gains, policies to mitigate climate change should include control of a wider range of combustion-related pollutants in addition to carbon dioxide emissions. A substantial proportion of the major causes of global warming also directly damage health, and it is important to be aware that control of some combustion-related pollutants may lead to quick reductions in global warming.

There is also a potential risk of either the creation, or an increased risk, of health effects from air pollution if climate change mitigation policies do not address health directly. Examples of such potential threat include the proliferation of diesel cars not equipped with appropriate exhaust control systems. While such cars emit less carbon dioxide than petrol-powered cars, they create more fine PM. Similarly, reducing air circulation through buildings to conserve energy could increase the risk of mould.

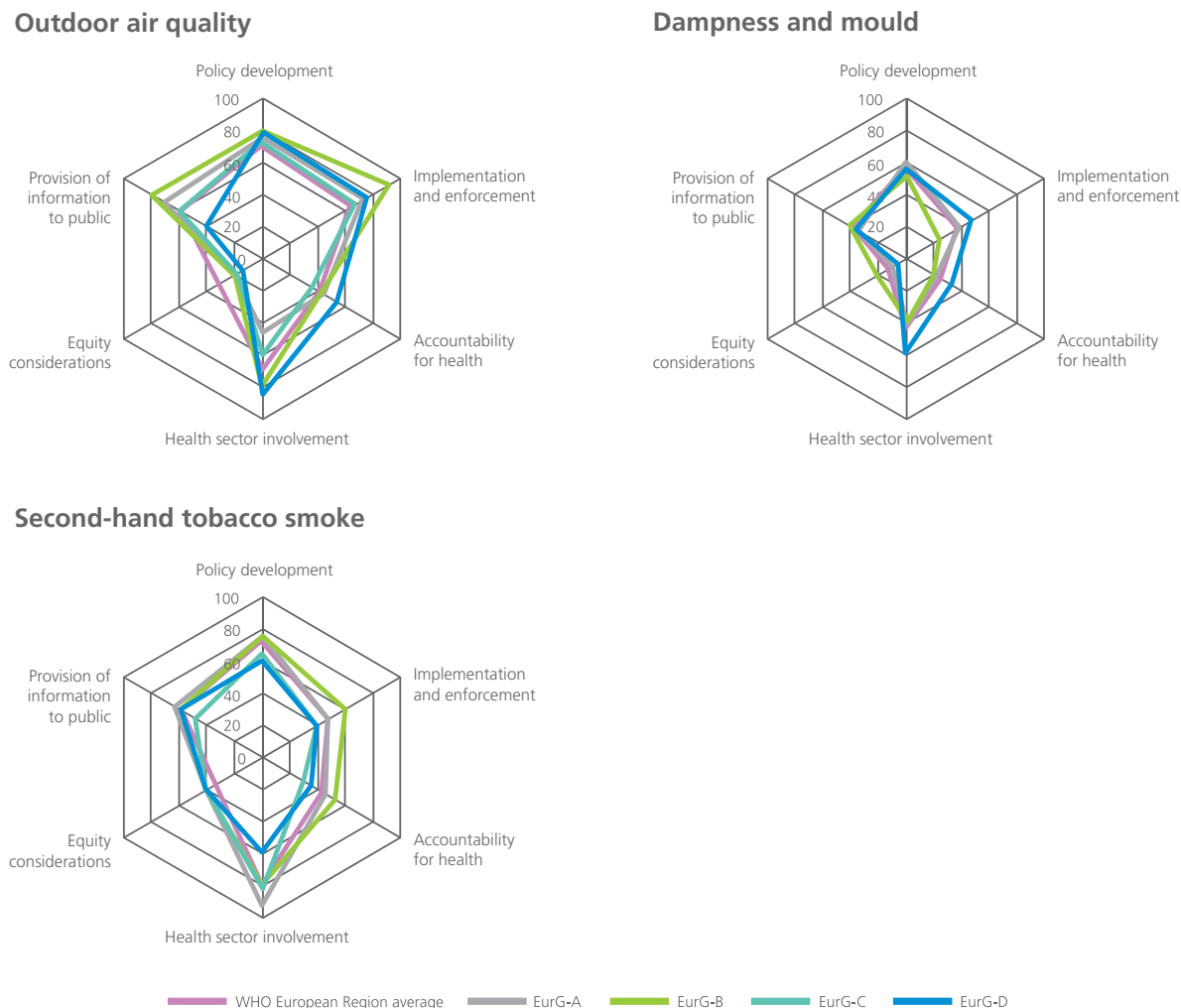
The consequences of climate change on respiratory disease are difficult to predict but will depend, in part, on the specific region concerned and population-level characteristics. Diseases expected to be affected include asthma, rhinosinusitis, chronic obstructive pulmonary disease and respiratory tract infections (31). Policies intended to mitigate climate change in various sectors would generally appear to result in net benefits for respiratory health, mainly by reducing population exposure to hazardous air pollutants (32–34).

Air quality and health: policy analysis

This policy assessment of outdoor air quality, dampness and mould and SHS is based on responses to the WHO survey on EH policies received from 38 Member States. As with other topics, not all countries submitted information for all policies. The majority completed questionnaires concerning outdoor air quality and SHS, but only 23 countries did so for the dampness and mould questionnaires. No EurG-C countries provided information on this topic.

The policy profiles for these three topics are shown in Fig. 39. All country groups reported having outdoor air quality policies and a significant number had SHS policies. To some extent, this may reflect the existence of strong EU legislation, the WHO Framework Convention on Tobacco Control and WHO's air quality guidelines. Implementation of policies addressing dampness and mould generally showed the lowest score – which is of concern, given the importance of this health issue.

Fig. 39. Policy profiles for outdoor air quality, dampness and mould and SHS



Public governance

Objectives, scope and type of policy measures

Most policy measures covering outdoor air quality aim to ensure compliance with national air quality standards and thresholds for pollutants emission at the source. For all EU member states and two thirds of the countries of south-eastern Europe, these policies follow EU regulations and other international commitments. The link with international regulations is less common in EurG-D countries. On the other hand, direct reference to the health objectives of the policies is more often reported from the latter group of countries than from the others. In 90% of responding countries, national ambient air quality policies cover pollutants which fall within the scope of EU legislation – PM, ozone, nitrogen dioxide and sulfur dioxide. Policies in more than one third of countries cover additional pollutants: heavy metals, black smoke, total suspended PM, volatile organic compounds, fluorides, chlorinated substances and dioxins. Only a few countries in EurG-D group have introduced standards for the inhalable, health-relevant proportion of PM (PM₁₀ or PM_{2.5}).

For dampness and mould, EU member states tend to have comprehensive measures in place, in particularly within the EurG-A grouping (Fig. 40). In the EurG-D countries, building codes and regulations for the construction and maintenance of new buildings seem to be the most widespread policies. Policies directly addressing damp and mould in existing buildings are common in EurG-A but rare in the other countries.

Fig. 40. Scope of policy measures on damp and mould, by country grouping

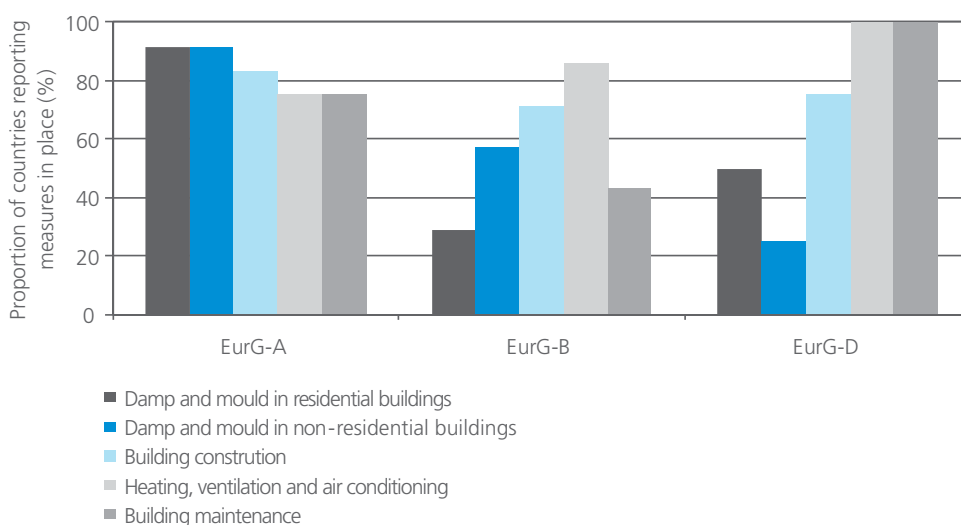
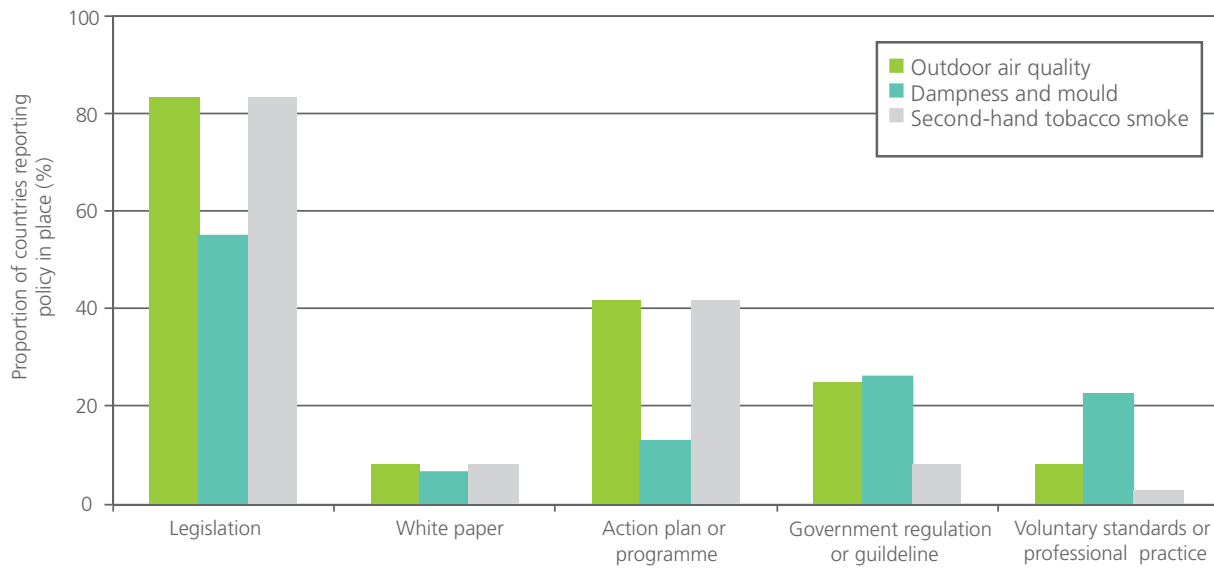


Fig. 41 shows the distribution of policy instruments on outdoor and indoor air quality. Outdoor air quality is subject to almost twice as many policy instruments as indoor air, and legislation is the predominant tool. Several countries have action plans or programmes for outdoor air and SHS; this is less common for damp and mould, where policy is often based on softer measures such as government regulations or guidelines and voluntary standards. Government regulations or guidelines are particularly infrequent relating to SHS.

Differences in the spread of instruments relating to outdoor air quality, dampness and mould and SHS largely reflect the impact of EU policies and legislation on the entire WHO European Region in those areas where EU legislation is strong. Air quality directives are the most important driving forces for the improvement of outdoor air quality policies, even outside the EU. Several of the EurG-C countries, such as Croatia and Turkey, as well as the Republic of Moldova (EurG-D), are working to harmonize their air quality legislation with that of the EU.

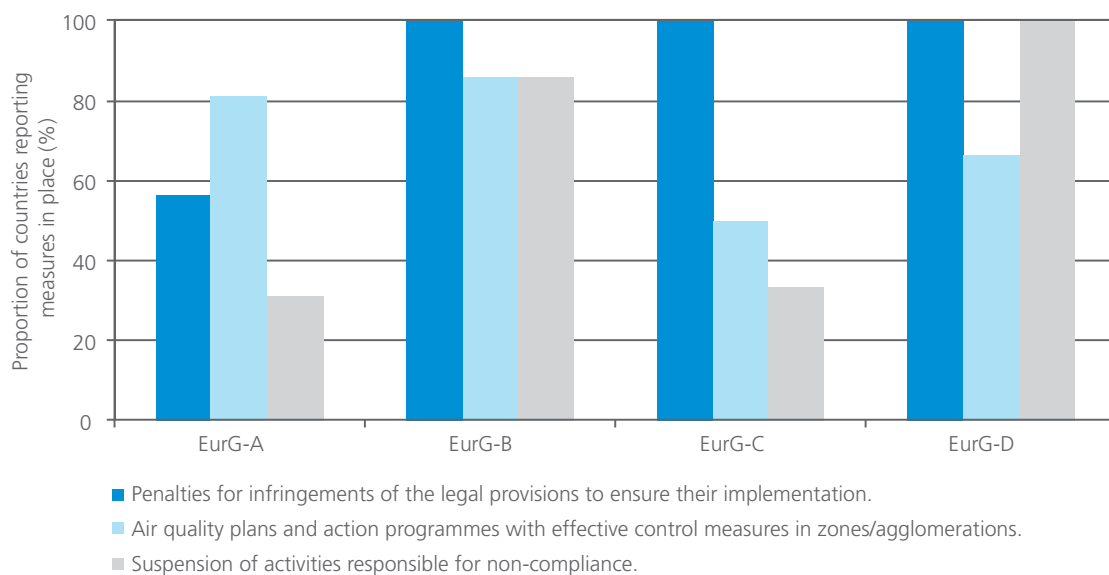
Fig. 41. Types of policy instrument for outdoor air quality, dampness and mould and SHS



Measures to assure compliance with policies

Penalties for infringements of regulations concerning outdoor air quality are the commonest measures, used by half of the EurG-A and all other countries (Fig. 42). A proactive approach, aiming at setting remedial measures (such as action plans) to eliminate non-compliance is more often used in EU countries than in the other parts of the Region.

Fig. 42. Measures to ensure policy compliance for outdoor air quality, by country grouping

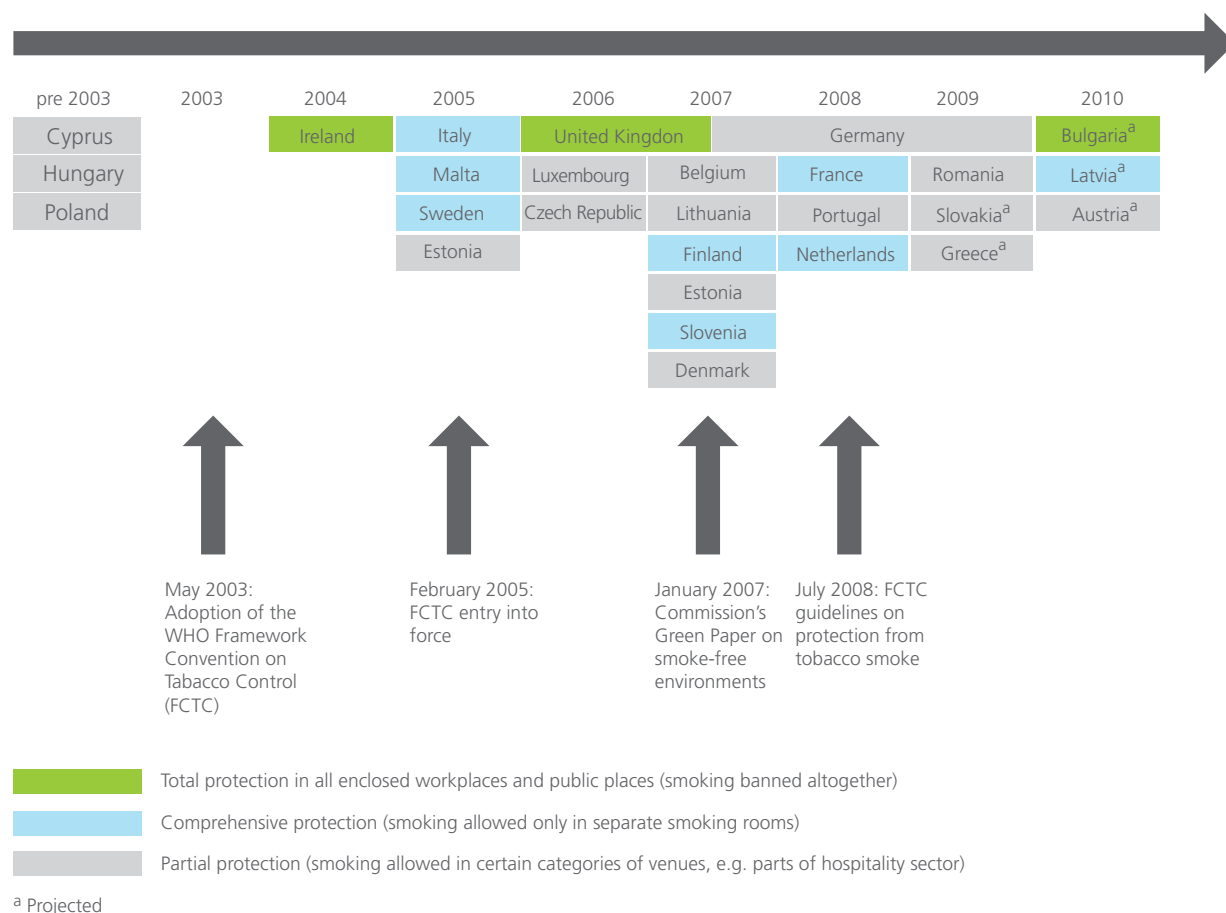


Measures to ensure compliance with regulations related to dampness and mould are relatively consistent across the EU, with the majority of countries usually turning to remedial measures and action to reduce the risk of non-compliance. Such action is less common in EurG-D countries, which all use penalties for infringements of legal provisions.

Penalties for non-compliance with regulations related to SHS are the commonest measures across all countries. Typically, these measures involve the use of prosecutions, fines and other legal penalties. In

addition, more than half of the countries across the Region may prohibit the use of buildings where there is reason to believe that regulations will not be followed. Legislation for smoke-free environments is relatively new and is still being implemented across Europe (Fig. 43) (35). Some examples of the effectiveness of smoke-free laws are given in Box 2. In many countries, lobby groups, notably those representing bar and restaurant owners, have argued that smoking bans would affect their profits, which should be given greater priority than the health of their workers and customers. As a result, in more than half of the Member States, citizens and workers are still not fully protected from exposure to tobacco smoke in indoor workplaces and public places. Despite arguments and claims from the hospitality industry, experience in countries which have already implemented smoke-free laws shows that such legislation has not had a negative impact on business: indeed, restaurants are becoming more popular (36). A Eurobarometer survey of March 2009 found 84% of EU citizens in favour of smoke-free offices and other indoor workplaces, 77% in favour of smoke-free restaurants, and 61% supporting smoke-free bars and pubs (37).

Fig. 43. Implementation of smoke-free laws in the EU, June 2009



Source: adapted from European Union (38).

Box 2. Examples of the impact on health of laws restricting smoking

Recent studies (36) have shown that the significant reduction in SHS resulting from regulations restricting smoking has also led to major improvements in respiratory health. For example, bar workers in Scotland reported a reduction in respiratory symptoms of 26% only one month after the introduction of such legislation. Furthermore, asthmatic bar workers reported a decrease in airway inflammation after three months.

While few data exist in Europe, a study in California showed that bartenders experienced a reduction in respiratory symptoms of 59% and a 78% decrease in sensory irritation symptoms just eight weeks after the implementation of such regulations in bars.

Laws restricting smoking have also been shown to reduce the prevalence of active smoking (36). In Ireland, 46% of smokers claimed they were more likely to stop after the implementation of such legislation, and 80% of them later reported that they had stopped. In addition, 60% of smokers in Ireland stated that the new regulations had caused them to cut back on smoking by about four cigarettes a day. Similar results were also seen in Scotland, where 44% of former smokers claimed that the regulations had helped them to stop.

Impact of international policy processes on national standards

The EU Directive on ambient air quality and cleaner air for Europe (39) was adopted in May 2008. Despite the WHO air quality guidelines, the permitted pollution levels from PM are significantly higher than WHO guideline levels. Nevertheless, if the targets and objectives of the Directive are achieved, significant reductions in risks for acute and chronic health effects from air pollution can be expected. Further efforts will be needed to achieve the WHO air quality guideline levels and the health protection they offer.

The use of international standards for outdoor air quality creates the obligation on each EU country to comply and adapt their national laws accordingly. The influence of the EU Directive and of WHO's guidelines has extended beyond the EU: more than two thirds of countries in the Region reported that they had adopted new or updated policies on outdoor air quality since 2004. For example, both Belarus and Turkey have recently begun monitoring PM₁₀ levels.

Article 8 of the Framework Convention on Tobacco Control (FCTC) (40), the world's first public health treaty, has become a strong driver for the reduction of smoking and exposure to SHS in Europe. Ratification of the FCTC in 2004 has been followed by adoption of the Convention across the majority of WHO European Member States (48 out of 53). The goal of the FCTC is a complete smoking ban in all countries worldwide; actual implementation is, however, poor. Some countries in the EU are only in the first stages towards total smoking bans which, for many of them, mean a transitional period before stricter policies are enforced. Outside the EU, few countries have made significant progress towards creating smoke-free environments.

Until now, indoor air standards have been voluntary. The recent launch of WHO's first indoor air quality guidelines on dampness and mould can, however, be expected to have a significant impact on future regional policies (41).

Healthy public policy

Overall, all countries scored poorly for all the three air quality issues evaluated in this report for the most important dimensions of healthy public policy.

Policy evaluation and health accountability

Countries reported using various methods and tools for monitoring and evaluating outdoor air quality policy. Monitoring networks for ambient air quality are in place in many countries – an essential prerequisite to support the implementation and enforcement of air quality regulations. Monitoring in more than 30 countries across Europe encompasses a set of air pollutants at a representative selection of stations. Countries annually report data following the EU Directive on the exchange of information on ambient air quality (42). Belarus and Turkey have launched systematic countrywide monitoring of health-relevant pollutants such as PM, and the Russian Federation has recently put in place the necessary legal framework. Towards the east of the Region and in the EurG-D countries, the monitoring of air pollution

and (as important) reporting of information to public databases are less transparent. This poses significant challenges for the preparation of information and its effective use in policy.

Advances in monitoring and in air quality databases allow regular assessments to be made of the effectiveness of policy implementation. Overall, around half of all European countries, but only one in six of the reporting countries in the EurG-D group, use specific indicators coupled with targets to measure progress towards policy objectives. In western Europe, indicators of air quality are now regularly assessed. The adoption of Directive 2008/50/EC on ambient air quality shifted the focus of regulation from assessing the state of the environment to health-relevant integrated management (39). This will enhance the health accountability of air quality policy.

Measures to ensure policy accountability for health in SHS policies are often limited. While more monitoring and periodic reports appear to be available in EU countries than in EurG-C and EurG-D countries, the overall monitoring, reporting and systematic evaluation of policy measures remain weak across the Region.

The monitoring of policies on dampness and mould and evaluation of the health impacts of these policies remain in their infancy throughout the Region. More generally, the use of health impact assessments as a standard tool in air quality and health policy, coupled with follow-up programmes focusing on health consequences, is urgently needed across the Region. When implemented, these will increase the integration and accountability of health policy in air quality regulations.

Health sector involvement in intersectoral policy action

Countries in the EurG-D grouping reported a higher level of health sector involvement in outdoor air quality policy formulation than other parts of the Region, especially EurG-A countries, where only half report any health sector involvement at that stage of the policy process. To some extent, this could be an effect of the traditional division of responsibilities and the role of the sanitary-epidemiological system in the east of the Region, and the assignment of responsibilities related to outdoor air quality to the environment sector in EU countries. EurG-D countries also report a much greater involvement of the health system in outdoor air quality monitoring, evaluation and enforcement than in other parts of the Region (Fig. 44). While, potentially, this should assure the health relevance of the policies and action, their restricted scope and the obsolete methods of air quality monitoring limit the effectiveness of action by the health sector.

EurG-D countries also reported the highest health sector involvement in relation to the implementation, evaluation and enforcement of policies related to dampness and mould. However, the scores are about 30% lower overall, indicating that not enough attention is being paid to this problem.

Fig. 45 shows that between-country patterns of health sector involvement in SHS policies – a core mandate of health authorities – differ significantly from the patterns related to outdoor air quality. Health sector involvement is quite high throughout EurG-A, EurG-B and EurG-C countries. In EurG-D countries, however, the level of health sector involvement in SHS policy evaluation, control and enforcement is low. Since, in contrast to outdoor air quality, SHS is predominantly a health issue, this low level involvement of the health sector may indicate a low priority being given to SHS in EurG-D countries.

Equity considerations

Perhaps with the slight exception of policies related to SHS, there is little evidence that the needs of vulnerable groups are considered in the European policies reported on air quality and health. With a few exceptions (Box 3), consideration of vulnerable groups remains particularly low in relation to policies addressing damp. This contrasts with the recognition that residents of poor housing experience a higher frequency of problems with damp.

Fig. 44. Involvement of the health sector in the policy cycle for outdoor air quality

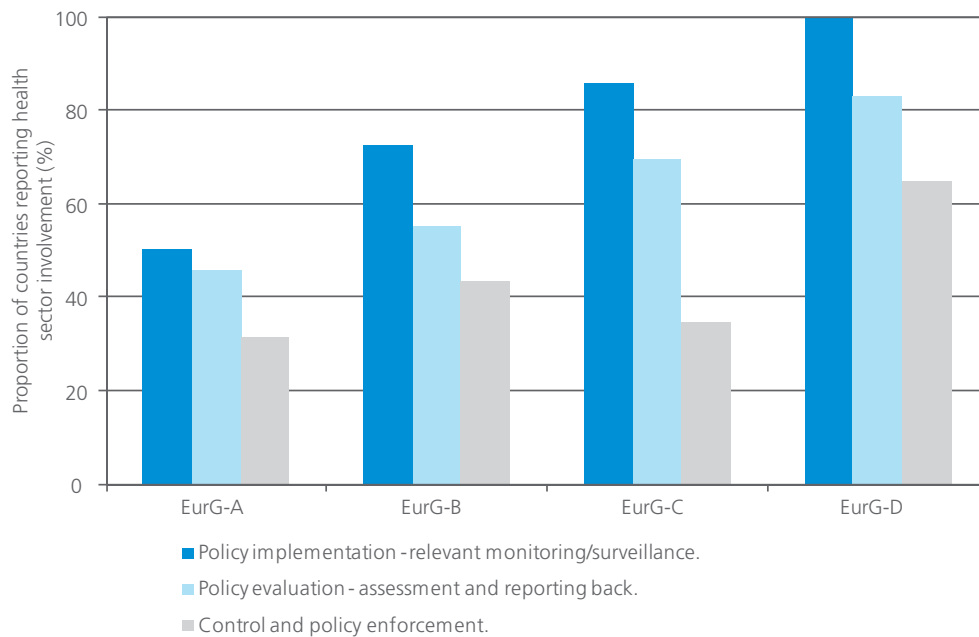
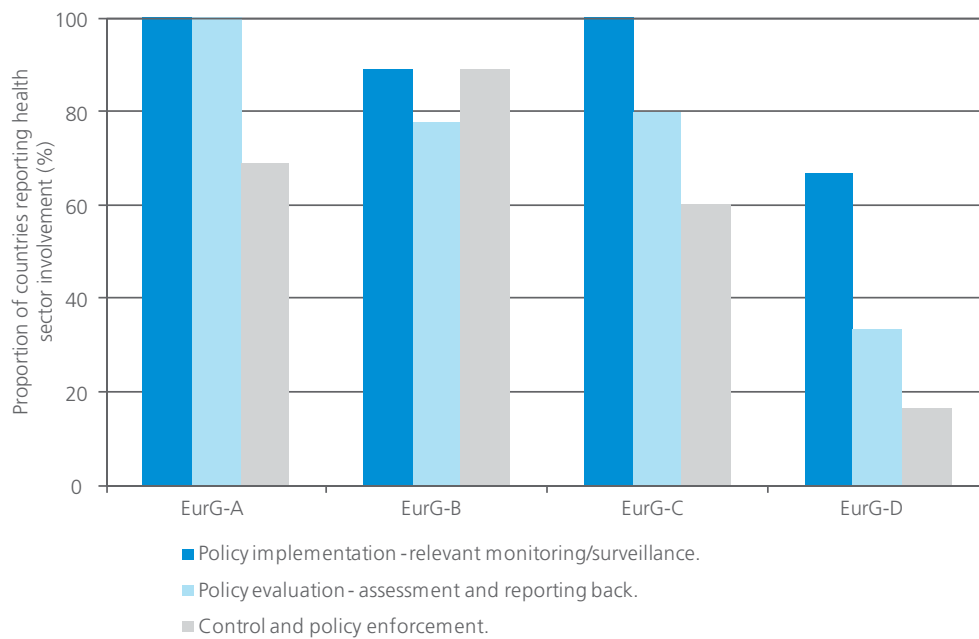


Fig. 45. Involvement of the health sector in the policy cycle for SHS



It might be argued that the lack of equity considerations in outdoor air quality policy may be because good outdoor air quality is treated as a universal good, with measures to improve air quality benefitting everybody. Nevertheless, for the EurG-C and EurG-D countries, given the need for huge investments in outdoor air quality monitoring and, in particular, in remedial measures where resources are limited, it is possible that staged action targeting specific population subgroups, such as poorer neighbourhoods within big cities, might offer the greatest health and environment benefits in the shortest time.

Smoke-free environments are becoming a greater focus of policy and society in many European countries, and vulnerable groups should become a priority of those policies. Such groups are, however, still not considered often enough (although more commonly than in the other aspects of policies on clean air) (Fig. 46). The lack of focus on children, pregnant women and workers in measures to prevent exposure to SHS, reported by many countries, emphasizes the need for urgent action.

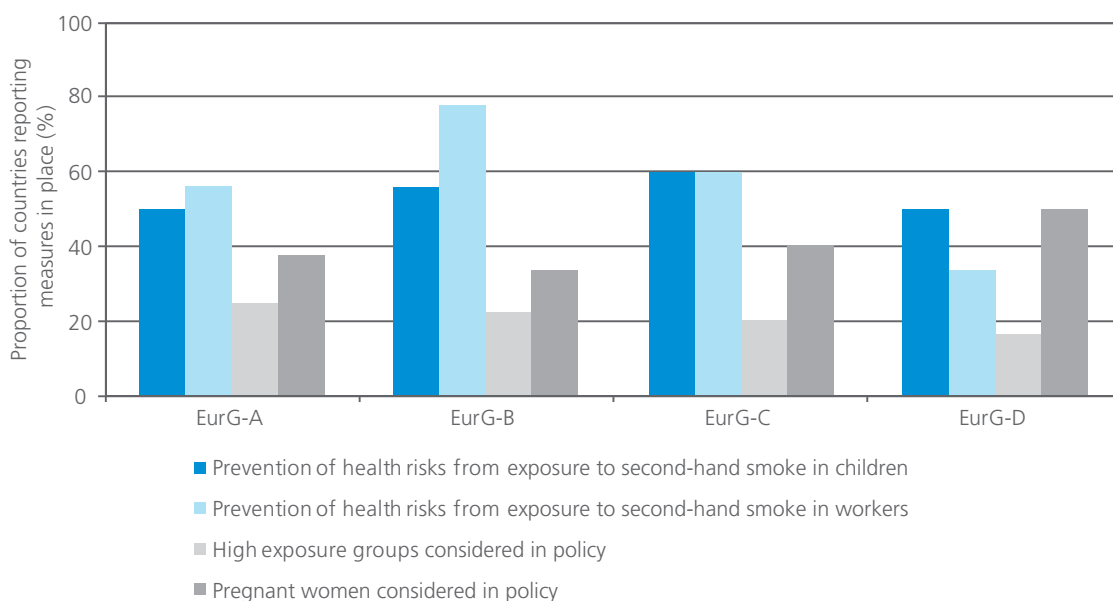
Box 3. Reducing the health effects of dampness and mould in indoor air

A WHO Working Group reviewing interventions to reduce the impacts on health of damp and mould (43) has identified a few projects addressing vulnerable groups. It appears that consideration of the particular needs of vulnerable and underprivileged groups is a part of intervention programmes in some of the Nordic countries and the United Kingdom. Equity is also a key pillar of the newly launched Norwegian strategy for prevention and treatment of asthma and allergic diseases (44).

A specific case from the United Kingdom is the Warm Front initiative (45), which aims to improve the health of low-income households in cold dwellings by increasing the indoor temperature through the installation of draught-stripping, insulation and gas central heating. Warm Front was beneficial in increasing the indoor temperature and thermal comfort, with the householders feeling most comfortable at 19 °C, and in decreasing relative humidity and mould.

Universal measures that mitigate the equity aspects of damp and mould were also explored by the WHO Working Group. Israel provides a good example (46). A new thermal insulation standard for buildings was introduced in 1985, when there was high public awareness of the problem of damp and mould in many Israeli dwellings whose inhabitants mainly belonged to low-to-medium income groups. A universal law was introduced requiring more insulation in newly constructed buildings. The policy resulted in a drop in damp and mould problems in new dwellings. However, no requirements for improving thermal insulation were imposed on existing buildings.

Fig. 46. Considerations of specific population groups in SHS policies



Transparency and communication

Country groups differ in the measures they take to inform people about the hazards of air pollution and the steps that can be taken to avoid exposure and health risks. EurG-D countries score significantly worse at providing information to their populations for all three issues, and especially so in relation to outdoor air quality. This may partly be due to cultural and historical reasons, and the relative importance governments give to informing the public. Information on the health effects of, and mitigating measures for, SHS exposure is becoming available throughout Europe, although unacceptably slowly. The provision of information to people about the health risks of exposure to mould and damp and remedial action is also very poor across the entire Region.

Overall progress

Although infant mortality from respiratory disease has declined throughout the Region, it still contributes substantially to the overall burden of disease, especially in the eastern part of the Region. Chronic respiratory diseases, in the form of asthma and allergies, are now the most common childhood diseases and are on the increase.

Both outdoor and indoor air pollution, much of which is anthropogenic, contributes markedly to the incidence and/or prevalence of different respiratory diseases in children in all populations. Lives are substantially shortened by this pollution throughout the Region. Exposure is often linked to socioeconomic status, both at individual level (e.g. damp housing) and at population level (e.g. industrial processes and the intensity and quality of transport in residential areas). Although reductions in pollution have occurred in previous decades in many countries in the Region, further improvement in air quality and reduction of the burden of disease due to air pollution have stalled in the last decade. Such environmental exposure must be reduced through coordinated policy efforts.

In many countries in the Region, especially EU countries, reliable and up-to-date information on air quality and health is available. Towards the east of the Region, and in the newly independent states in particular, information is generally poor and not easily accessible. Highly important information relevant to health, especially regarding the population's exposure to the inhalable proportions of PM (PM₁₀ and PM_{2.5}), is lacking. This restricts the possibility for proper assessment of the risk from air pollution, the development of effective air pollution reduction strategies, and monitoring of the effects of policy implementation. There has been a shift in the development of outdoor air quality policy from regulation of emissions or compliance with threshold concentrations towards a reduction in exposure of the population. This is mainly the result of WHO's guidelines followed by international legislation, but requires better monitoring and impact assessments.

Both EU legislation and WHO's air quality guidelines are important instruments promoting national policy development. The FCTC has become a strong driver for SHS reduction in EU countries and calls for similar action in the rest of the Region. The lack of international legislation or guidelines for damp and mould may be a reason for this field to have been largely "below the radar" for the last decade in EH policies across the Region. The recent launch by WHO of the first indoor air quality guidelines on dampness and mould should, if implemented, have a clear impact on the development of EH policy in Member States.

References

1. Brauer M et al. Air pollution and development of asthma, allergy and infections in a birth cohort. *European Respiratory Journal*, 2007, 29:879–888.
2. Pope AC, Ezzati M, Dockery DW. Fine-particulate air pollution and life expectancy in the United States. *The New England Journal of Medicine*, 2009, 360:376–389.
3. *Air quality guidelines, global update 2005*. Copenhagen, WHO Regional Office for Europe, 2006 (<http://www.euro.who.int/Document/E90038.pdf> accessed 9 February 2010).
4. *WHO guidelines for indoor air quality – dampness and mould*. Copenhagen, WHO Regional Office for Europe, 2009.
5. *Infant mortality from respiratory disease*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 3.2).
6. WHO mortality database [web site]. Geneva, World Health Organization, 2009 (<http://www.who.int/healthinfo/morttables/en/>, accessed 9 February 2010).
7. European health for all database [online database]. Copenhagen, WHO Regional Office for Europe, 2009 (<http://www.euro.who.int/hfadb>, accessed 8 February 2010).
8. "Effects of air pollution on children's health and development". Copenhagen, WHO Regional Office for Europe, 2005.
9. *Global surveillance, prevention and control of chronic respiratory diseases: a comprehensive approach*. Geneva, World Health Organization, 2007 (<http://www.who.int/gard/publications/GARD%20Book%202007.pdf>, accessed 9 February 2010).
10. *Asthma and allergies in children*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 3.1).
11. *The European health report 2009. Health and health systems*. Copenhagen, WHO Regional Office for Europe, 2009 (<http://www.euro.who.int/Document/E93103.pdf>, accessed 9 February 2010).
12. *Chronic obstructive pulmonary disease (COPD)*. Geneva, World Health Organization, 2009 (Fact Sheet).

13. *Annual European Community LRTAP Convention emission inventory report 1990–2006*. Copenhagen, European Environment Agency, 2008 (EEA Technical report No. 7/2008, http://www.eea.europa.eu/publications/technical_report_2008_7, accessed 9 February 2010).
14. *Exposure of children to air pollution (particulate matter) in outdoor air*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 3.3).
15. AirBase – the European Air quality dataBase (online database). Copenhagen, European Environment Agency, 2009 (<http://air-climate.eionet.europa.eu/databases/airbase/>, accessed 10 February 2010).
16. Barrett K et al. *Health impacts and air pollution – an exploration of factors influencing estimates of air pollution impact upon the health of European citizens*. Bilthoven, European Topic Centre on Air and Climate Change, 2008 (ETC/ACC Technical Paper 2008/13, http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2008_13_HealthImpact_AirPoll.pdf, accessed 10 February 2010).
17. *Health risks of ozone from long-range transboundary air pollution*. Copenhagen, WHO Regional Office for Europe, 2008.
18. Fontham E et al. American Cancer Society perspectives on environmental factors and cancer. *CA: A Cancer Journal for Clinicians*, 2009, 59:343–351.
19. *Exposure of children to second-hand tobacco smoke*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 3.4).
20. *Summary of the impact assessment: accompanying document to the proposal for a Council Recommendation on smoke-free environments*. Brussels, Commission of the European Communities, 2009.
21. Cesaroni G. et al. Effect of the Italian smoking ban on population rates of acute coronary events. *Circulation*, 2008, 117:1121–1123.
22. Global Youth Tobacco Survey (GYTS) [web site]. Geneva, World Health Organization, 2009 (<http://www.who.int/tobacco/surveillance/gyts/en/index.html>, accessed 10 February 2010).
23. Pierce J, León M. Effectiveness of smoke-free policies. *Lancet Oncology*, 2008, 9(7):614–615.
24. *Proportion of children living in homes with solid fuels*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 3.6).
25. Multiple indicator cluster survey [web site]. New York, United Nations Children’s Fund, 2009 (http://www.unicef.org/statistics/index_24302.html, accessed 10 February 2010).
26. Demographic and health surveys [web site]. Calverton, MD, Measure DHS, 2009 (<http://www.measuredhs.com>, accessed 10 February 2010).
27. World health survey [web site]. Geneva, World Health Organization, 2009 (<http://www.who.int/healthinfo/survey/whsresults/en/index.html>, accessed 10 February 2010).
28. *Children living in homes with problems of damp*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 3.5).
29. European Union statistics on income and living conditions (EU-SILC) [online database]. Brussels, Eurostat, 2009 (http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc, accessed 10 February 2010).
30. *Interventions and actions against damp and mould: a review of case studies*. Copenhagen, WHO Regional Office for Europe, 2008.
31. Ayres J et al. Climate change and respiratory disease: European Respiratory Society position statement. *European Respiratory Journal*, 2009, 34(2):295.
32. Markandya A et al. Health effects of strategies to reduce greenhouse gas emissions: low carbon electricity generation. *Lancet*, 2009, 374:2006–2015.
33. Wilkinson P et al. Public health effects of strategies to reduce greenhouse gas emissions: household energy. *Lancet*, 2009, 374:1917–1929.
34. Woodcock J et al. Public health effects of strategies to reduce greenhouse gas emissions: urban land transport. *Lancet*, 2009, 374:1930–1943.
35. Smokefree Partnership [web site]. Brussels, Smoke Free Partnership, 2009 (<http://www.smokefreepartnership.eu/Smoke-free-legislation-in-the-EU>, accessed 9 February 2010).
36. *WHO report on the global tobacco epidemic: Implementing smoke-free environments*. Geneva, World Health Organization, 2009 (<http://www.who.int/tobacco/mpower/en/>, accessed 9 February 2010).
37. *Survey on tobacco. Analytical report*. Eurobarometer, 2009 (Flash Eurobarometer No. 253 (http://ec.europa.eu/health/ph_determinants/life_style/Tobacco/Documents/eb_253_en.pdf, accessed 9 February 2010).
38. Directorate-General of Health and Consumer Protection, key documents [web site]. Brussels, European Union, 2009 (http://ec.europa.eu/health/ph_determinants/life_style/Tobacco/keydo_tobacco_en.htm, map on http://ec.europa.eu/health/ph_determinants/life_style/Tobacco/Documents/tobacco_map.pdf, accessed 10 February 2010).
39. Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. *Official Journal of the European Union*, 2008 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:152:0001:0044:en:pdf>, accessed 9 February 2010).
40. *WHO Framework Convention on Tobacco Control*. Geneva, World Health Organization, 2003 (<http://whqlibdoc.who.int/publications/2003/9241591013.pdf>, accessed 9 February 2010).
41. WHO publishes first indoor air quality guidelines on dampness and mould [web site]. Copenhagen, WHO Regional Office for Europe, 2009 (http://www.euro.who.int/eprise/main/WHO/MediaCentre/PR/2009/20090715_1?language, accessed 9 February 2010).
42. Exchange of information and data on ambient air quality [web site]. Brussels, European Union, 1997 (http://europa.eu/legislation_summaries/environment/air_pollution/128031b_en.htm, accessed 9 February 2010).

43. Case studies on interventions to reduce health effects from damp and mould [web site]. Copenhagen, World Health Organization, 2008 (http://www.euro.who.int/Housing/support/20080917_1, accessed 9 February 2010).
44. *Nasjonal strategi for forebygging og behandling av astma- og allergi- skydommer 2008 – 2012 [National strategy for prevention and treatment of asthma and allergic diseases – 2008]*. Oslo, Helse- Og Omsorgsdepartementet [Ministry of Health and Care Services], 2008 (<http://www.regjeringen.no/upload/HOD/Dokumenter%20FHA/astmastrategi.pdf>, accessed 9 February 2010).
45. *Interventions and actions against damp and mould: a review of case studies – Case study 15*. Copenhagen, World Health Organization, 2008 (http://www.euro.who.int/document/HOH/15_warmfrontthermalhousingimprovement_uk.pdf, accessed 9 February 2010).
46. *Interventions and actions against damp and mould: a review of case studies – Case study 13*. Copenhagen, World Health Organization, 2008 (http://www.euro.who.int/document/HOH/13_thermalinsulationstandardchange_israel.pdf, accessed 25 January 2010).

Eliminating environmental health hazards

Regional priority goal IV: *We commit ourselves to reducing the risk of disease and disability arising from exposure to hazardous chemicals (such as heavy metals), physical agents (e.g. excessive noise), and biological agents and to hazardous working environments during pregnancy, childhood and adolescence.*

Key messages

- Policies and action to limit exposure to persistent organic pollutants (POPs) and heavy metals in food, and to eliminate exposure to lead from leaded petrol have all achieved considerable success within the Region. Constant awareness is, however, needed. Moreover, there are still challenges in many countries, with a need for improved monitoring and enforcement.
- International cooperation on food safety has proved efficient, as countries develop coherent standards and regulations aiming to ensure the same level of health protection for as many citizens as possible.
- There is a lack of appropriate publicly available environmental health data, especially regarding exposure to heavy metals but also regarding contamination of the food chain and the burden of foodborne disease.
- Consideration of health aspects in environmental policies for heavy metals is low in most countries and is not proportional to the risks to health which heavy metals may create.
- Environmental noise is perceived as the most common stressor: a quarter of the population in EU countries is exposed to noise levels leading to a wide range of health effects. Noise abatement policies in many Member States need to be strengthened to address health problems effectively.
- Safety in the occupational environment improved significantly in the 1990s, but in the last decade the improvement has levelled off in the eastern part of the Region.

Regional priority goal IV addresses a wider range of environmental health issues than goals I–III and is associated with diverse environmental health risks such as toxic chemicals, physical agents (e.g. harmful noise, and ionizing and ultraviolet radiation) and hazardous working environments. It focuses on policy action to reduce and prevent hazardous exposure with an emphasis on children and other age-specific sensitivity windows. Furthermore, this goal pays particular attention to child labour and advocates the elimination of its worst forms.

This chapter focuses on three areas, giving an assessment of the situation, progress and policy action regarding:

1. issues related to (i) food safety, including exposure to hazardous chemicals in food; (ii) general exposure to lead; and (iii) chemical safety aspects of other heavy metals;
2. environmental noise;
3. occupational health, in particular work-related health problems.

Consideration is paid to the health burdens, public concerns, availability of data and evidence, and potential to take targeted action to benefit health. Despite their differences they are all of special concern for children's health for similar reasons: the particular sensitivities of children in the pre- and postnatal periods due to their rapid development; their different metabolisms and behaviour compared to adults; and their longer life expectancy, which render them more vulnerable than adults to many environment hazards.

Chemical hazards

Exposure to chemical hazards

People are exposed to huge numbers of industrial and household chemicals, pesticides and metals in air, water, food and consumer products. Many of these chemicals can be hazardous to health, especially if they are used inappropriately. Children are particularly vulnerable to chemical hazards for various reasons including naïve behaviour and because their organ systems are rapidly developing. Symptoms arising from prolonged low-level chemical exposure may only appear later in life and may be chronic and irreversible. Global industrialization, urbanization and intensive agriculture, together with growing patterns of unsustainable consumption and environmental degradation, contribute to exposure to hazardous chemicals.

New chemicals are constantly synthesized for various purposes and the capacity rigorously to test the safety of all of them prior to use is very limited. The EU Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) regulation (1), introduced in June 2007, makes industry responsible for assessing and managing the risks posed by chemicals and providing appropriate safety information to their users. Adverse health outcomes are a result of many factors including the compound's toxicity, and the exposure levels and characteristics of the exposed population. It is, however, assumed that many new chemicals will not take on public health importance.

Food safety is one of the most important factors for good health. Several serious accidental poisonings have arisen due to food contaminated by POPs or heavy metals, and long-term low-level exposure can cause chronic health effects. Furthermore, the microbiological safety of food is crucially important for public health. The surveillance of foodborne diseases and the monitoring of contamination in the food chain are, however, inadequate. Reporting of foodborne disease only represents the tip of the iceberg. A risk-based approach is needed in the management of exposure to chemical hazards. Priority should be given to assessing those chemicals with the greatest risks for public health, those that accumulate in the body and those to which chronic exposure at low levels cause adverse health outcomes.

Groups of chemicals that should be considered when assessing the safety of food are pesticide residues, veterinary drug residues, heavy metals, POPs and other organic contaminants, microbial toxins, food additives, compounds formed unintentionally during the processing of food, contaminants from packaging and storage and, last but not least, the major constituents of food itself, such as excess salt, sugar and fat (2). The inherent toxicity of a substance does not necessarily indicate high public health concern, as population exposure and vulnerability are also important determinants.

Persistent organic pollutants

POPs have been recognized as a serious concern since the 1960s and 1970s, when dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs) were banned or phased out in many industrialized countries. Over time, it became clear that this was not sufficient. Besides staying in the environment for long periods, POPs are prone to accumulate in higher organisms and to magnify in the food chain: levels increase by several orders of magnitude from sea plankton up the food chain to people (3). Owing to their semi-volatility and persistence, some are transported through air and water to locations where they have never been used, such as the Arctic. At high concentrations, POPs cause reproductive and developmental effects in wild and laboratory animals (4,5). There is more

uncertainty about health effects in humans at typical levels of exposure, which can be lower than in some other species.

Among the POPs, polychlorinated dioxins (PCDDs) and dioxin-like chemicals (including polychlorinated dibenzofurans (PCDFs) and dioxin-like PCBs) appear to have the lowest safety margin and to be the most likely group to cause adverse effects in humans. During the 1970s, at concentrations 5–10 times higher than at present, they were possibly the cause of subtle effects such as effects on tooth development (4,6). The sources of these compounds were the incineration of municipal waste, chlorine gas bleaching of wood pulp and the metal industries, together with a number of minor sources. Until the 1980s, there were also important impurities in the production of certain chemicals (PCBs, chlorophenols and their derivatives). Advances in abatement have been greatest in areas such as waste incineration and the pulp and paper industry, resulting in the reduction of POP concentrations in environmental samples, including lake- and seabed sediment layers, fish, fish-eating birds and seals (7). The largest remaining sources are the metal and cement industries, landfill fires and small-scale wood and biomass burning. There may still be considerable variations among countries.

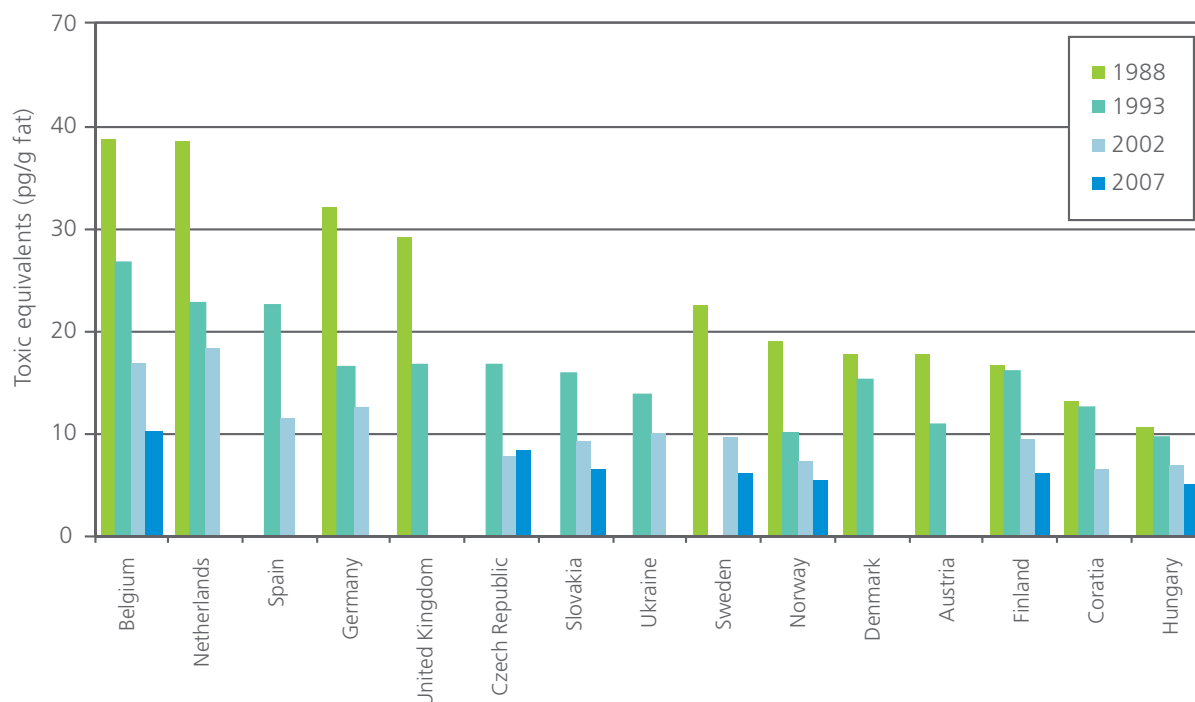
There is evidence that developmental effects occur even at the lowest measured POP concentrations (4,6). Dioxin levels in human milk provide a long-term average of the body burden because these persistent compounds accumulate in breast tissue. They are relevant both as an indicator of risk during pregnancy and for measuring the chemical intake by the breastfed baby. Both of these steps are believed to be crucial for assessing the risk of developmental effects for the whole population. The most systematic information on POPs in humans is based on four rounds of human milk analysis studies of dioxins and PCBs coordinated by WHO (7). Dioxin levels in human milk have decreased in all countries monitored since 1988 (Fig. 47) (7). Several European countries with higher initial levels have made particularly dramatic and important reductions. In spite of the decrease, the margin between currently prevalent and known toxic levels is still narrow enough to be of concern (8).

WHO recognizes this concern. Nevertheless, the net beneficial effect of breastfeeding as the optimal food source for newborn babies should always be emphasized, especially when sharing information with the general public (9).

The body burden is clearly age-dependent and is lowest in younger age groups. For older populations with higher body burdens, the relative risk of cancer, while real, is not very high even at the highest industrial exposures (10,11). Recent results of studies on families of fishermen indicated that, despite much higher dioxin and PCB body burdens, mortality (including cancer mortality) was lower than in the general population, possibly due to the other, beneficial effects of consuming fish (12). In Seveso, Italy, after a very high level of accidental exposure, there were reports of developmental effects on teeth, altered sex ratios and a possible increase in some rare types of cancer (13–15).

It is more difficult to assess the health risks of compounds other than dioxins, as the data on both exposures and effects are less systematic. Organochlorine pesticides or their metabolites can still be found in human samples in Europe, but the concentrations are low and their health relevance has clearly decreased (7). Some compounds have more recently come into focus. Polybrominated diphenyl ethers (PBDEs – flame retardants used in plastics and textiles) were found in human milk at the end of 1990s (7). Certain brominated diphenylethers, such as tetra- to octa-congeners, are absorbed by different animal species and bioaccumulate to some extent. They were therefore banned by the European Commission in 2004 and their concentrations in Europe are now decreasing. Even so, continued monitoring is warranted because there is uncertainty about the metabolic fate of decabromodiphenyl ether (BDE-209), which is still in production. It is itself very poorly absorbed by biota and fairly rapidly eliminated in humans (16), but it may be broken down into more toxic forms.

Fig. 47. Dioxin levels in human milk in selected countries, 1988-2007



Source: WHO Regional Office for Europe (7).

Another new group of halogenated compounds is perfluorinated alkyl compounds (PFAs), such as perfluorooctane sulfonate, which were introduced as water repellents and for many other uses. They are also highly persistent and have been shown to accumulate in animals. Some of these compounds have, therefore, been voluntarily phased out by industry but are worth monitoring because of their persistence.

Heavy metals

Heavy metals remain of particular concern, despite being a priority for regulatory measures for decades. This section focuses on lead, mercury, cadmium and arsenic, for which the evidence on hazardous properties and population exposures is the most reliable. These four metals differ in their sources and the potential outcomes of exposure (Table 5) (17).

Table 5. Main sources, potential health problems from exposure and provisional tolerable weekly intake for arsenic, lead, methylmercury and cadmium

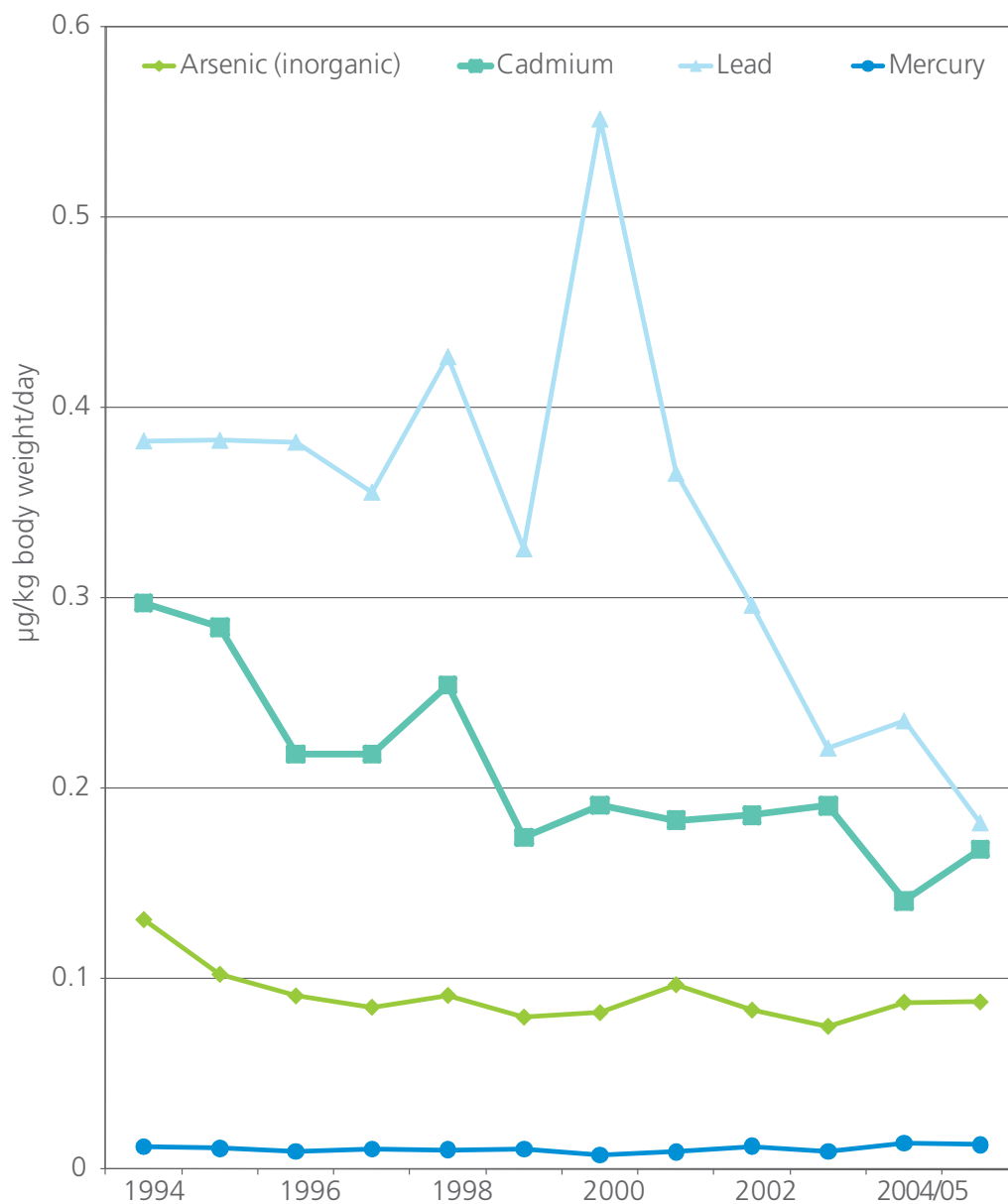
	Main sources	Primary health concerns	Provisional tolerable weekly intake (mg/kg body weight)
Arsenic	Contaminated food/water, some paints	Neurological and developmental disorders	0.015
Lead	Air, water, fuels, marine life	Neurodevelopmental and neurological disorders; organ damage	0.025
Methyl mercury	Fish/seafood	Neurological and developmental disorders	0.0016
Cadmium	Contaminated food	Kidney damage, low birth weight, spontaneous abortion	0.007

Source: WHO Regional Office for Europe (17).

Average intake levels of lead, mercury, cadmium and arsenic in the adult diet in 13 European countries in the early 2000s are available from the EU scientific cooperation assessment of dietary exposure (18). In most countries, adult intake levels were typically 10–30% of provisional tolerable weekly intake (PTWI), but sometimes higher. Data on intake by children are patchy: total intake seems to be lower than in adults, but intake per unit of body weight is higher (18).

Monitoring of chemical contaminants in food through total diet studies is an established practice in the Czech Republic. The observed amount of all metals in the total diet of the general population between 1994 and 2007 was far below the PTWI values (Fig. 48) (17). However, young children tend to eat different types of food, and different amounts per unit of body weight, so these results are not directly applicable to children under three years of age who are particularly vulnerable to the neurotoxic effects of chemicals.

Fig. 48. Mean level of selected hazardous metals in the total diet of the general population, Czech Republic, 1994–2007



Source: WHO Regional Office for Europe (17).

The organic form of mercury, methylmercury, appears to be of greatest concern for children notwithstanding the significant limitations of information on children's exposure to heavy metals in food. Methylmercury is highly toxic, particularly to the nervous system; the developing brain is known to be particularly sensitive. Owing to the transport of mercury through the environment and its bioaccumulation, the main source of exposure to methylmercury in the general population is diet, in particular through the consumption of fish, particularly via certain species. It is assumed that all of the mercury in fish is present as methylmercury (18). Toxicity has been demonstrated at low exposure levels, but fish can also be an important component of a healthy diet. It is, therefore, essential that clear guidelines for optimal fish consumption levels are widely publicized (19). Food sources other than fish and seafood products may contain inorganic mercury, which is considerably less toxic than methylmercury.

The estimated intakes of methylmercury in Europe vary by country and region, depending on the contamination level and the amount and type of fish consumed. Some population groups may frequently consume large predatory fish (such as swordfish, tuna and pike), which are at the top of the food chain and often have a higher concentration of methylmercury. A recent EU assessment (20) suggested that as many as 1 in 20 people may be affected. The study estimated that 1–5% of the general population in Europe (3 to 15 million people) are over the limit that the EU uses. Even more worrying is the fact that a proportion of this population, notably Mediterranean fishing communities, have levels ten times as high as the recommended norm.

The potential negative effects on health from consuming contaminated food can be greatly reduced by improving the production, processing and handling of food, educating people to limit the intake of high-risk foods and, as a priority for a longer time span, reducing environmental pollution.

Lead is one of the most dangerous chemicals to children. The most important effect of long-term exposure is neurotoxicity, particularly during the first two to three years of life when early development of the central nervous system occurs. Exposure to lead during this time increases the risk of mild mental retardation, attention deficit hyperactivity disorder and other developmental disabilities (21). An elevated blood lead level (10 µg/dl or above) has been associated with toxicity in the developing brain and nervous system of young children, leading to a lower intelligence quotient. More recent evidence indicates that similar effects may occur below 10 µg/dl and that preventive activities should therefore aim to bring down the amount of lead in the blood to the lowest possible levels (22). Lead in the environment has multiple sources, including the combustion of leaded petrol, industrial processes, paint, solder in canned foods and water pipes. Exposure to lead occurs through a number of pathways (such as air, household dust, road dirt, soil, water and food). Evaluation of the relative contribution of the different sources is complex and is likely to differ between areas and population groups.

Exposure to lead in Europe has clearly decreased in the last 20 years following the elimination of tetraethyl lead as an anti-knock additive in petrol in many countries. Generally, lead in blood levels began to decline earlier in western European and Scandinavian countries than in eastern Europe, largely due to the earlier introduction of unleaded petrol. Emission trends from 24 European countries have shown that total emissions of lead dropped by 90% from 1990 to 2003 (22). In the mid-1980s, a collaborative study between WHO and the European Commission found levels of lead in children's blood of 18.2–18.9 µg/dl in Bulgaria, Hungary and Romania compared to 11.0 µg/dl in Italy and 7.4 µg/dl in Germany (21). This difference was still evident in the 1990s, with considerably lower levels in France, Germany, Israel and Sweden compared to Hungary and the Russian Federation (21).

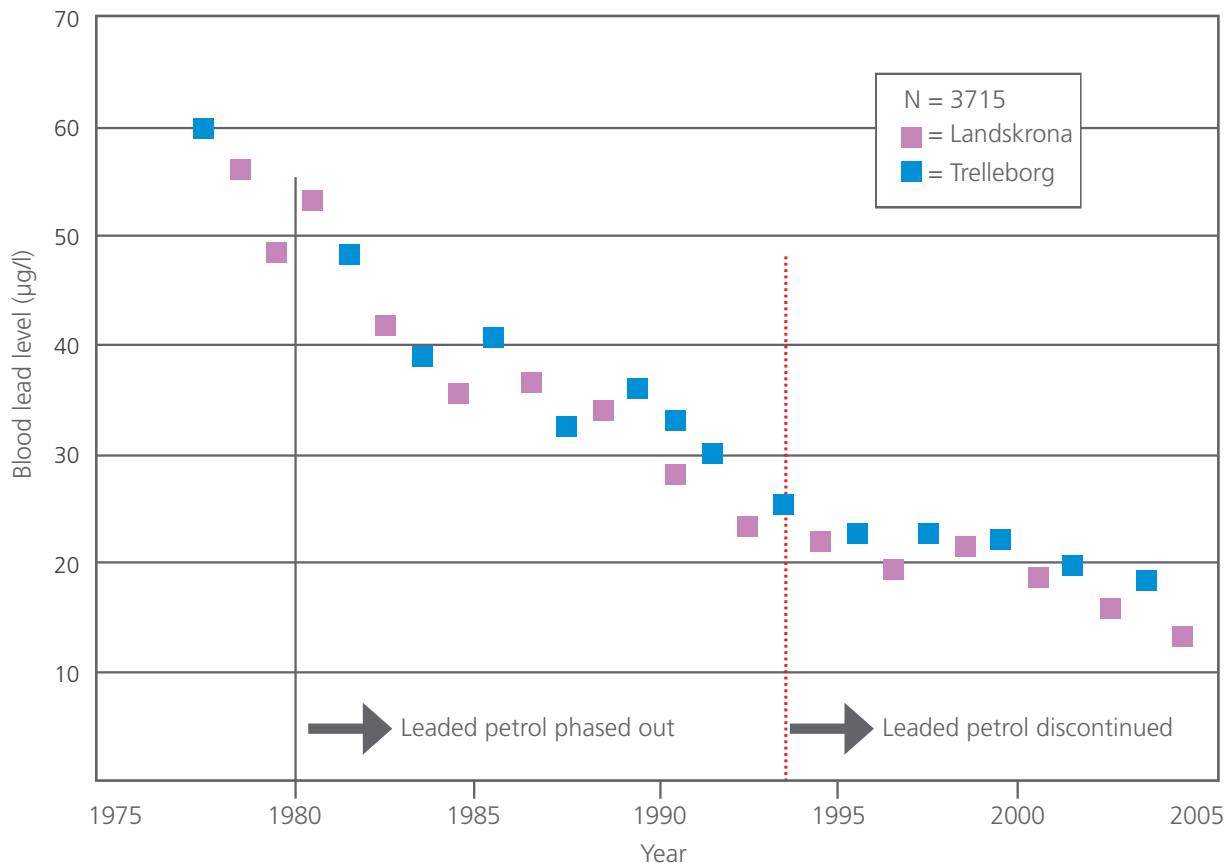
The benefits of switching completely to unleaded petrol are further illustrated by a series of blood lead measurements in 3700 children living in urban Sweden (Fig. 49) (22). A dramatic decline was observed between 1978 and 2005, with the first decrease in the early 1980s when unleaded fuel was introduced.

Residual exposure to re-suspended lead disappeared only after the complete elimination of leaded petrol from the market in 1994.

Although many countries have applied systematic interventions to phase out industrial sources of lead emissions, leaded petrol still exists in some countries in the east of the Region. For example, it will not be completely phased out in Montenegro and Serbia until 2015. Furthermore, measurements of blood lead levels in children living near hot-spots show that plumbing and local industries continue to be important sources of concern in some countries (e.g. Bulgaria, Poland, Russian Federation, The former Yugoslav Republic of Macedonia, Ukraine) (21). Although lead levels in people show a decrease in all these countries, it is difficult to assess progress owing to a lack of systematic human bio-monitoring.

Regular population-based surveys of lead in blood, and monitoring of other chemicals of concern, using uniform protocols specific to various age groups, would greatly enhance the ability to assess exposure and trends as well as the potential health impacts and effectiveness of policy measures.

Fig. 49. Blood lead levels in Swedish children, 1978–2005^a



^a Leaded petrol was phased out from the beginning of the 1980s.

Source: WHO Regional Office for Europe (22).

Microbial contamination of food

Although a strong theme in this chapter is chemical contamination of food, it is essential that exposure to hazardous microbiological agents in food should not be overlooked. Foodborne disease caused by microbes, both sporadic cases and outbreaks, is very common throughout the Region, even in countries with high hygiene standards. The most common clinical presentation of microbiological foodborne diseases takes the form of gastrointestinal symptoms, but such diseases can also lead to chronic symptoms

including arthritis, neurological or immunological disorders and cancer as well as septicaemia, multi-organ failure and death. Foodborne outbreaks are about an order of magnitude commoner than waterborne episodes, although fewer people are typically involved in each foodborne outbreak.

The global burden of foodborne diseases and its impact on development and trade are currently unknown. Data are sparse and only cover people who have sought medical care and who have received an accurate diagnosis, provided the reporting system is operational and efficient. Reliable epidemiological data are, however, urgently needed to enable policy-makers as well as other stakeholders to develop, monitor and evaluate food safety measures intended to prevent and control foodborne disease. In response to this need, the WHO Department of Food Safety and Zoonoses has, in collaboration with multiple partners, launched a new Initiative to Estimate the Global Burden of Foodborne Disease (Box 4) (23).

Box 4. Microbiological contamination and foodborne illness

The aims of the Initiative to Estimate the Global Burden of Foodborne Diseases are to:

- (i) obtain reliable epidemiological estimates on current, projected and averted morbidity, disability and mortality of foodborne diseases;
- (ii) provide countries with simple, user-friendly tools to conduct their own foodborne disease burden studies and examine the effectiveness of their prevention and intervention efforts.

Source: World Health Organization (23).

Food safety and chemical safety aspects of heavy metals: policy analysis

The policy survey covers the following four topics from regional priority goal IV: food safety, chemical safety of pesticides, chemical safety of heavy metals (especially lead and mercury) and environmental noise. Two additional policy topics were also covered: ultraviolet radiation and radon in dwellings. The WHO working group agreed to consider them optional and hence beyond of the scope of this assessment (24).

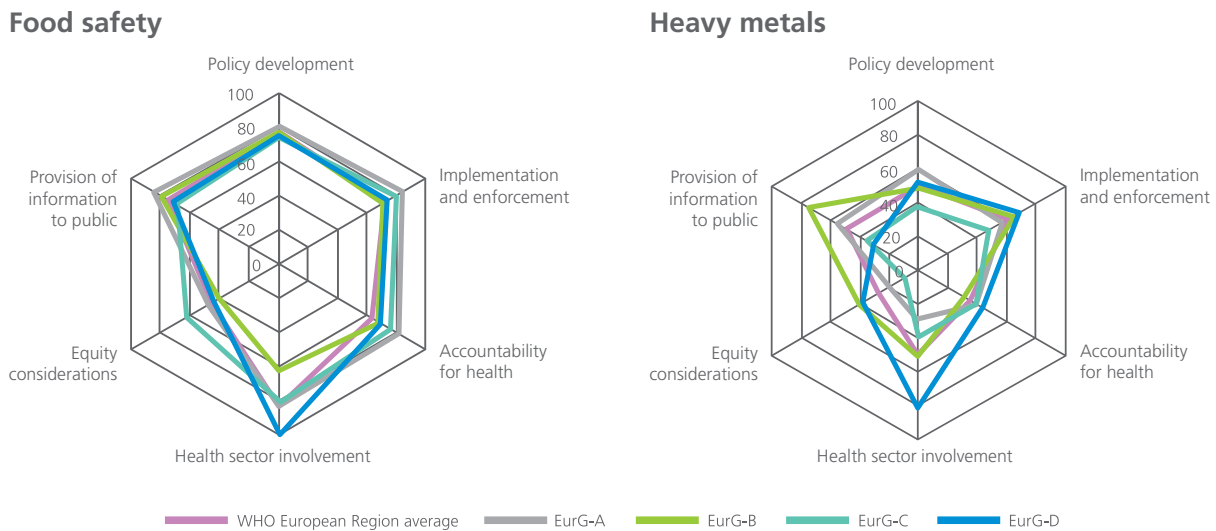
Thirty-seven Member States responded to the four core policy topics, although not necessarily to all of them (for more information see Annex 1). The focus here is on food safety, the chemical safety of heavy metals and environmental noise and countries' policy profiles are analysed along the six key aspects (for the methods, see Annex 2).

The policy profiles for food safety and chemical safety of heavy metals (lead and mercury) revealed rather distinct patterns (Fig. 50). Food safety, with its symmetrical profile and high scores on all aspects except equity considerations, shows that this topic has been the focus of public policy throughout the Region. Overall, this was the topic with the highest scores of all EH policy topics screened using the WHO survey. For heavy metals, the scores are lower and the patterns differ substantially among the country groupings, reflecting the lack of a comprehensive approach to this topic as an environmental public health issue.

Public governance

The high scores on policy development in all country groupings indicate the importance of food safety for many decades in the Member States. A closer look at national policy measures shows that compliance with food safety standards, regulations and international commitments both at EU and Region-wide level (the Codex Alimentarius (25)) is the most frequently reported objective (85–100%). The same holds true for policy on modern approaches to risk management through the implementation of Hazard Analysis and Critical Control Point system in food industries (26), although the rates in the newly independent states are lower.

Fig. 50. Profiles for food safety and chemical safety of heavy metals policy along the six aspects, by country grouping



Policy objectives related to the control, reduction and abatement of contaminants in primary production were reported to a less extent (75–90%) and so were those on food safety education for industry. Food safety education for primary producers was also of limited policy focus (45–70%). These lower rates are troubling as both the WHO/Food and Agriculture Organization’s (FAO) food safety guidelines (27) and European Community legislation (28,29) emphasize the benefits of integrated risk prevention throughout the entire food chain up to the consumer. Preparedness and response to emergencies, to ensure the protection of health, was subject to greater policy focus in EurG-A and EurG-B countries than in the other Member States.

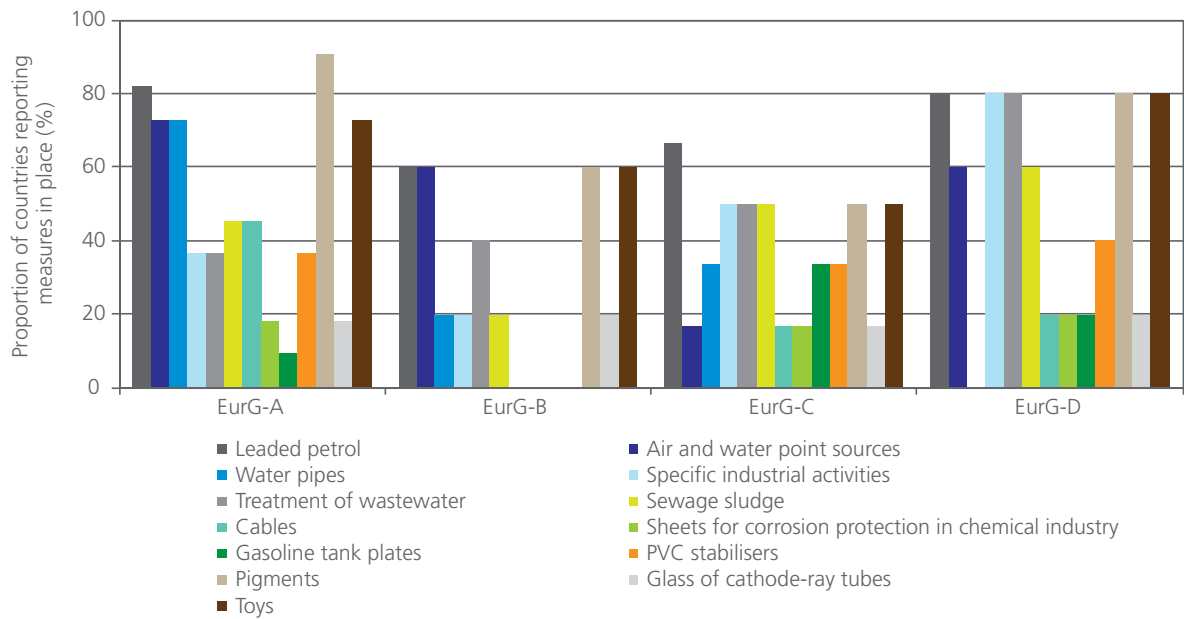
Where the scope of food safety policies is concerned, the key health issues covered reflect historical trends. Most countries have policies for traditional infectious diseases such as salmonellosis and clostridium botulism as well as for chemical contaminants such as heavy metals and pesticides. Specific policies for listeriosis and brucellosis have also generally been adopted, with the exception of the EurG-D grouping where they were less often reported. EU countries reported policies for campylobacteriosis and POPs to a greater extent than the other two groupings. Policies covering emerging issues, such as antimicrobial resistance, are only evident in the EurG-A grouping.

With respect to policy objectives regarding heavy metals, as with most other topics compliance with international commitments such as the *Convention on Long-Range Transboundary Air Pollution* (30) and EU legislation is at the top of the policy agenda across the Region, with rates of 80–85%. There was less prevention and reduction of health risks (60–80%), with the highest rates in the newly independent states. There were many fewer reports of policy measures relating to education in personal protection and in healthy behaviour, notably in the EurG-B and EurG-C groupings (20% and 15%, respectively). National laws and regulations regarding chemicals in the newly independent states have generally been inherited from the Soviet era and are in need of further modernization and harmonization to meet present international requirements (31).

Only EurG-A countries focus on regulations to control products containing heavy metals throughout their entire life-cycles (classification, labelling, packaging, marketing, storage, use, distribution, trade and disposal) (85%). EurG-C countries lack important objectives for their policy measures, especially the control and disposal of stocks of outdated products and preparedness and response to emergencies.

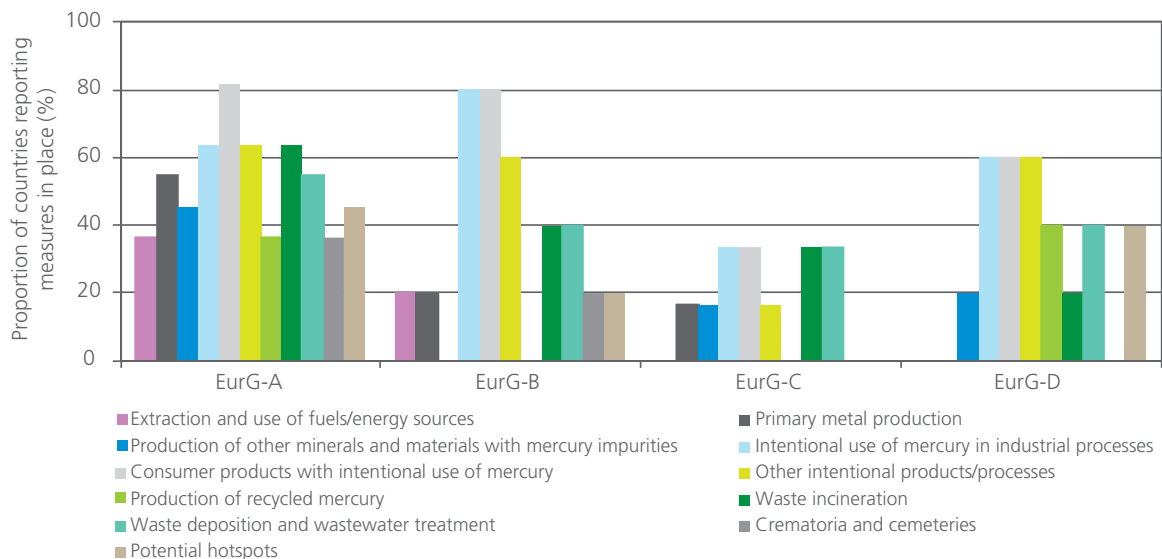
The scope of chemical safety measures (i.e. key health-environment issues covered in the policies) differ for lead and mercury and between country groupings. All countries have reported lead in petrol as a key policy issue, yet it is still used in many countries (Fig. 51). Only the EurG-A countries have effectively phased out leaded petrol, and the consequences are apparent from the trends in population exposure to lead. The use of lead in industry and in consumer products has a very long tradition, and the difficulties in phasing it out are most probably the reason for differences in country rates.

Fig. 51. Scope of policy measures on chemical safety aspects of lead, by country grouping



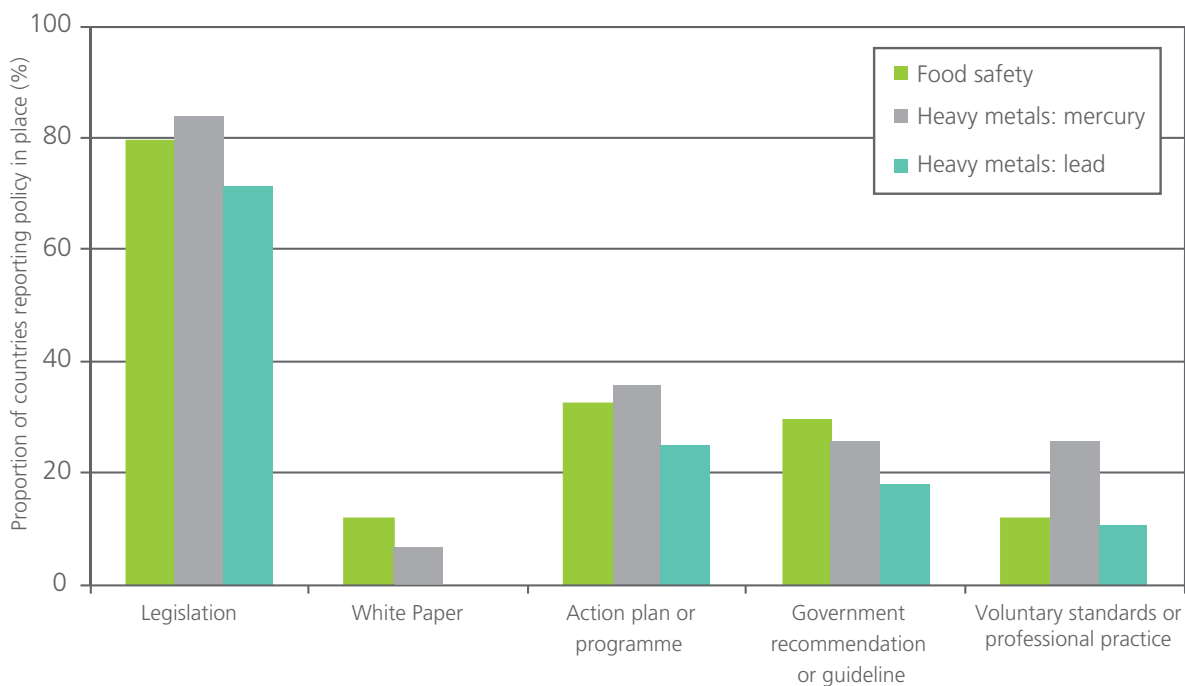
So far as mercury is concerned, EurG-A and EurG-B countries have harmonized their legislation, notably as regards the intentional use of mercury in industrial processes and in consumer products (Fig. 52). In response to continuing concern over mercury exposure, the European Commission has proposed a regulation to ban the export of mercury in the EU and to ensure the safe storage of surplus mercury. This has been confirmed by the European Parliament and will take effect in March 2011 (32). Significant gaps remain regarding key health issues in national policies, in particular in EurG-C countries, including the intentional use of mercury in industry and consumer products, as well as pollution hotspots.

Fig. 52. Scope of policy measures on chemical safety aspects of mercury, by country grouping



On average, 70% of the countries reported that they had legislation in place concerning food safety and the chemical safety aspects of lead and mercury (Fig. 53). Few other policies were reported for heavy metals. The number of action plans or guidelines is somewhat higher for food safety. Legislation on heavy metals is generally somewhat older than food safety legislation, reflecting rapid recent developments within food safety policy. As the environmental health situation varies widely in Europe, a further analysis of the reported types of legislation shows that regulations covering mercury are more widespread in EurG-A and EurG-B countries than in the EurG-C or EurG-D groupings, while the differences are less marked for lead.

Fig. 53. Types of policy instrument for food safety, mercury and lead



Food safety was among the first environmental health issues to be globalized. Since the food trade is extensive and requires common ground for quality and safety issues, FAO established the following three global standards on food safety:

- the Codex Alimentarius for food (25);
- the International Plant Protection Convention for plants; and
- the World Organisation for Animal Health for animals.

The Codex Alimentarius Commission sets hundreds of food standards, guidelines and codes of practice covering all parts of the global food chain from the producer to the consumer. It has also set more than 1000 maximum limits for food additives and more than 3000 maximum residue limits for pesticides and veterinary drugs.

The three bodies together help countries to comply with the World Trade Organization's Agreement on the Application of Sanitary and Phyto-sanitary Measures. This recognizes a country's right to restrict trade in order to protect human, plant and animal health, but any regulations must be based on sound science and international agreements and not used simply to restrict trade. As stated above, global standards drive the compliance policies of the Member States. They are also the basis for the EU integrated approach to food safety, which aims to assure a high level of food safety, animal health, animal welfare and plant health through coherent farm-to-table measures and adequate monitoring, while also ensuring the effective functioning of the internal market.

The WHO Regional Office for Europe has developed the European Action Plan for Food and Nutrition Policy (33), establishing nutrition, food safety and food security goals. It provides a coherent set of integrated action spanning different government sectors and involving public and private actors. Member States take these into account when setting their own national policies for health system governance, as do international organizations at the regional and global levels.

The 1998 Aarhus Protocol on Heavy Metals (34), adopted within the framework of the Convention on Long-Range Transboundary Air Pollution (30), aimed at limiting emissions of mercury, lead and cadmium in Europe and North America. The Protocol lays down stringent limit values for emissions from stationary sources and indicates the best available techniques for these sources, such as special filters or scrubbers for combustion sources or mercury-free processes. The Protocol also requires Parties to phase out leaded petrol. This Protocol is yet to be signed and ratified by many EurG-C and EurG-D countries.

The Strategic Approach to International Chemicals Management (35) is an international mechanism of growing importance for improvements to health. It focuses on safe and environmentally sound waste management, the sound management of obsolete pesticides and other obsolete chemicals, and the development of the global legal instrument on mercury (36).

European Community Directives 2002/95/EC (37) and 2002/96/EC (38) are also important tools in helping to limit exposure to heavy metals, especially mercury and lead, through restricting the use of hazardous substances in electrical and electronic equipment and promoting the collection and recycling of such equipment.

Measures in cases of non-compliance with existing policies are quite similar across the Region, both as regards food safety and the chemical safety aspects of lead and mercury. The food safety measures score much higher than those on lead and mercury.

Penalties for infringement of the legal provisions regarding food safety are highest in the EurG-D countries. EurG-A countries tend to rely more on this approach than EurG-B and EurG-C countries. The EurG-A and EurG-D groupings reported a lower rate than the other two groupings for remedial measures to reduce or eliminate the risk of non-compliance, instead placing greater policy priority on the rectification of problems at source.

There are considerable shortcomings with the enforcement of and compliance with safety policies covering lead and mercury; the EurG-C countries in particular reported these as being under-provided. As with other policy topics, the penalties for infringement were highest in the EurG-D countries. The prohibition or restricted use of food, water and products contaminated with heavy metals which endanger health are the most common measures in EurG-A countries. EurG-B and EurG-D countries reported an 80% rate of remedial measures to reduce or eliminate the risk of non-compliance.

For heavy metals, it is notable that, to a greater extent than the other groupings, the newly independent states tended to report that (i) immediate investigations were carried out to identify the cause of the environmental contamination, (ii) mandatory reporting was required, and (iii) a competent authority existed. However, as concluded by the WHO meeting on chemical safety in newly independent states, although most countries have laws regarding the safe production, transport and trade of chemicals, their enforcement falls under the authority of different ministries (e.g. of the interior, transport, trade, health, environment, labour, customs and agriculture) and communication among them is often inadequate for the effective management of chemical risks (31).

Furthermore, with the primary reliance of law enforcement authorities on existing skills for inspection (e.g.

sanitary, veterinarian, environmental and ecological), there is wide variability in the levels of inspection, law enforcement and compliance. Some sub-laws and other legal acts contain varying standards for pollutants in various media. Evidently, however, there are often no standards for monitoring and evaluating newly emerging pollutants.

Healthy public policy

All country groupings scored much higher on policy accountability for health and the involvement of the health sector in food safety, thus indicating a great degree of health policy integration in the countries (Fig. 50). In contrast, the heavy metal policy scores are rather low, reflecting very fragmented consideration of health issues in national policies on this topic, particularly in EurG-C countries. All country groupings except the newly independent states gave low scores with respect to involvement of the health sector.

The most common evaluation methods in all country groupings are those based on foodborne disease surveillance and monitoring systems for microbiological and chemical food contamination, with all their deficiencies. However, actually using this information to identify and assess food-related health risks and the effectiveness of policy action is the most infrequent measure reported. As already noted, more effort is needed to use food monitoring data effectively to assess exposure to food contaminants in different population groups. Furthermore, national foodborne disease surveillance and food contamination systems need to be strengthened, notably regarding better integration of laboratory-based surveillance and better collaboration among health, veterinary and food-related disciplines.

The monitoring of progress under the policy, using specific food safety indicators and periodic reviews of policy obligations and targets, was reported as a common practice in EurG-A and EurG-B countries, who also reported greater use of systems for monitoring antimicrobial resistance in food bacteria.

The health accountability of policies on chemical safety of lead and mercury is weak throughout the Region. This is the result of poor monitoring systems, both of heavy metals in the physical environment and even more so regarding exposure and bio-monitoring (Fig. 54). EurG-A and EurG-B groupings have put more emphasis on heavy metals monitoring, the use of health-relevant indicators, and periodic reports to review policy targets. EurG-C countries reported the most infrequent use of several health accountability measures. The only exception was for the surveillance of heavy metals poisonings. A similar pattern appears within the EurG-D grouping.

The health sector's involvement throughout the food safety policy cycle is very high across the Region (Fig. 55A). This likely reflects the focus on independent governmental food safety control in society, both with the aim of maintaining health, and also to fulfil safety and quality standards of food- and feed-stuffs as traded goods. The lower extent of health sector involvement reported by new EU member states might be explained by some challenges in communication between the health sector and the relatively new national food safety authorities. Newly independent states reported a very high health sector involvement.

The involvement of the health sector in policies related to heavy metals is low for all groupings except the newly independent states (Fig. 55B), suggesting that other sectors are generally responsible for monitoring and enforcing these policies in the Region.

For food safety policies, equity issues are higher on the agenda in the EurG-C grouping than elsewhere: several EurG-C countries reported policies targeted directly at children, including education about food safety in schools. As regards heavy metal policies, EurG-B and EurG-D countries reported a focus on pollution hotspots and on children, most probably because of country-specific environmental health issues and priorities.

Fig. 54. Measures for health accountability for policies covering heavy metals, by country grouping

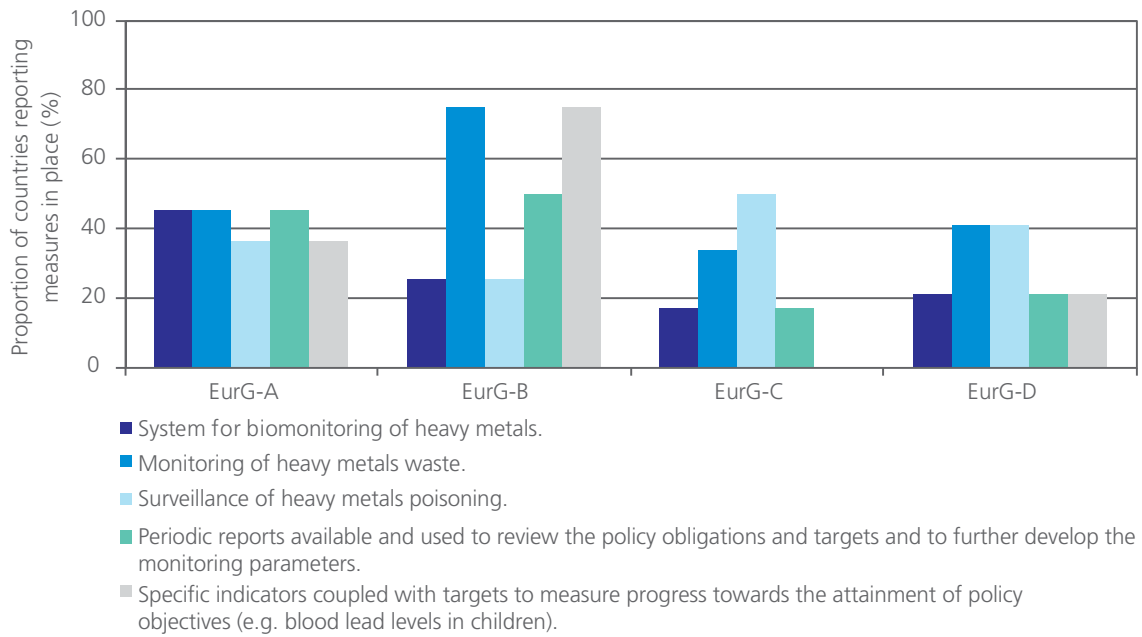
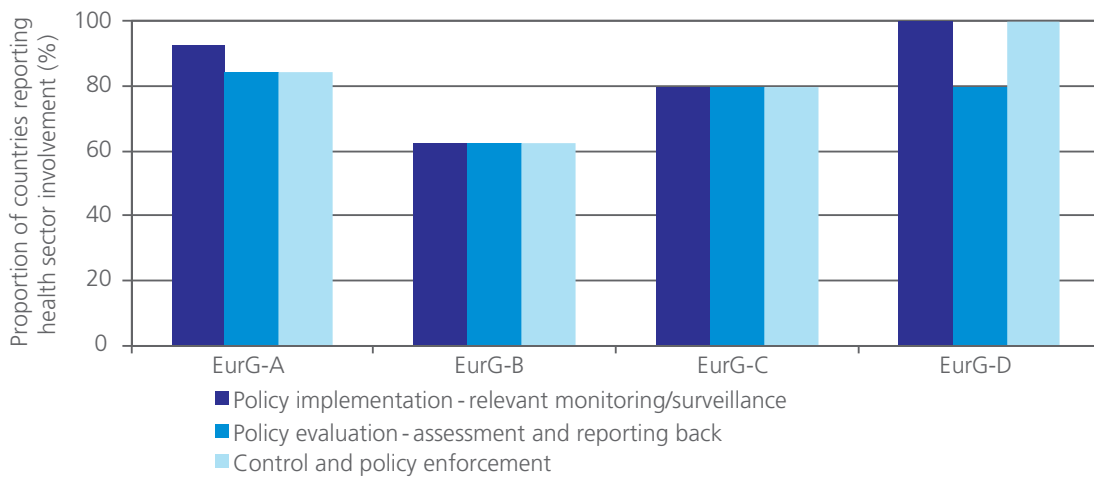
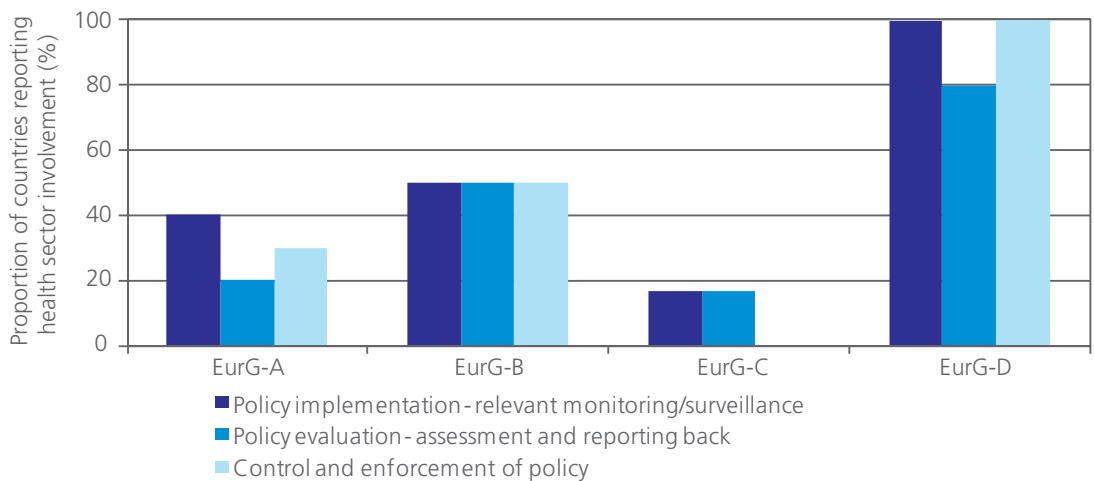


Fig. 55. Reported involvement of the health sector in policies covering A) food safety and B) the chemical safety aspects of lead and mercury, by country grouping

A. Food safety



B. Chemical safety of lead and mercury



Transparency and communication

Information to the public has a high priority in food safety policies. The slightly lower overall scores for EurG-C and EurG-D countries are mainly due to a lower focus on consumer information and food safety campaigns.

The EurG-A and EurG-B countries reached significantly higher scores than the other countries on information to the public about heavy metals. Most of these countries have reported information on action programmes and plans to reduce heavy metals, publish regular public reports on heavy metals in food, water and the air and promote action on the protection of public health and prevention of contamination from heavy metals. Only a few countries in the EurG-C and EurG-D groupings take action in this field. Another important issue could be that EurG-C and EurG-D countries have no monitoring results to communicate.

The European Pollutant Emission Register (39) is becoming increasingly important. This Europe-wide register provides easily accessible key environmental data from industrial facilities in EU member states and in Iceland, Liechtenstein and Norway, and contributes to transparency and public participation in environmental decision-making. For the European Community it implements the Pollutant Release and Transfer Registries Protocol (40) to the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (41). The Protocol became international law, binding its Parties on 8 October 2009.

An assessment of exposure to mercury and the environmental and health effects has never been carried out at European level. Moreover, the status of the implementation of the Aarhus Protocol on Heavy Metals (34) is quite weak in parts of Europe, so it cannot be expected that such an assessment will be completed within the next few years.

Overall progress

Several environmental hazards, including POPs, some chemicals found in food and lead, have been monitored fairly systematically in the Region for some time. The data indicate that exposures have generally declined since the implementation of remedial programmes and policies. This provides evidence for the feasibility and effectiveness of risk prevention policies and for the importance of expanding monitoring – both for exposure to environmental hazards and for health outcomes.

While food safety issues are high on the environmental health agenda throughout the Region, health-related aspects of heavy metals are less intensively addressed. The lack of political priority given to these issues is not consistent with the available data on existing exposures or their potential health effects.

References

1. REACH. What is REACH? [web site]. Brussels, European Commission, 2010 (http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm, accessed 13 February 2010).
2. Dalbokova D, Krzyzanowski M, Lloyd S, eds. *Children's health and the environment in Europe: a baseline assessment*. Copenhagen, WHO Office for Europe, 2007.
3. Technical Working Group on Integrated Monitoring. *Final report on actions and recommendations for "Integrated monitoring of dioxins and PCBs in the Baltic Region" in the framework of the European Environment and Health Strategy (COM(2003)338 Final)*. Brussels, European Commission, 2004 (http://ec.europa.eu/environment/health/pdf/dioxin_final.pdf, accessed 13 February 2010).
4. Miettinen, H. *The effects of TCDD on the development of teeth and cortical bones in rats: implications for risk assessment* [dissertation]. Kuopio, National Public Health Institute, 2006 (http://www.ktl.fi/attachments/suomi/julkaisut/julkaisusarja_a/2006/2006a10.pdf, accessed 13 February 2010).
5. Vos JG et al. Health effects of endocrine-disrupting chemicals on wildlife, with special reference to the European situation. *Critical Reviews in Toxicology*, 2000, 30:71–133.
6. Alaluusua S et al. Polychlorinated dibenzo-p-dioxins and dibenzofurans via mother's milk may cause developmental defects in the child's teeth. *Environmental Toxicology and Pharmacology*, 1996, 1:193–197.

7. *Persistent organic pollutants in human milk*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 4.3).
8. Dioxin exposure and health [web site]. Brussels, European Commission, 2008 (<http://ec.europa.eu/environment/dioxin/index.htm>, accessed on 13 February 2010).
9. Mead MN. Contaminants in human milk. Weighing the risks against the benefits of breastfeeding. *Environmental Health Perspectives*, 2008, 116(10):A427–434.
10. Kiviranta H. *Exposure and human PCDD/F and PCB body burden in Finland* [dissertation]. Kuopio, National Public Health Institute, 2005 (http://www.ktl.fi/attachments/suomi/julkaisut/julkaisusarja_a/2005/2005a14.pdf, accessed 13 February 2010).
11. Tuomisto JT et al. Soft tissue sarcoma and dioxins – a case control study. *International Journal of Cancer*, 2004, 108:893–900.
12. Turunen AW et al. Mortality in a cohort with high fish consumption. *International Journal of Epidemiology*, 2008, 37:1008–1017.
13. Alaluusua S et al. Developmental dental aberrations after the dioxin accident in Seveso. *Environmental Health Perspectives*, 2004, 112:1313–1318.
14. Mocarelli P et al. Paternal concentrations of dioxin and sex ratio of offspring. *Lancet*, 2000, 355:1858–1863.
15. Steenland K et al. Dioxin revisited: developments since the 1997 IARC classification of dioxin as a human carcinogen. *Environmental Health Perspectives*, 2004, 112:1265–1268.
16. Thuresson K et al. Apparent half-lives of hepta- to decabrominated diphenyl ethers in human serum as determined in occupationally exposed workers. *Environmental Health Perspectives*, 2006, 114:176–181.
17. *Exposure of children to chemical hazards in food*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 4.4).
18. *Assessment of the dietary exposure to arsenic, cadmium, lead and mercury of the population of the EU member states*. Brussels, Commission of the European Communities, Directorate-General Health and Consumer Protection, 2004 (http://ec.europa.eu/food/food/chemicalsafety/contaminants/scoop_3-2-11_heavy_metals_report_en.pdf, accessed 13 February 2010).
19. Castoldi A et al. Human developmental neurotoxicity of methylmercury: impact of variables and risk modifiers. *Regulatory Toxicology and Pharmacology*, 2008, 51:201–214.
20. *Communication from the Commission to the Council and the European Parliament on Community strategy concerning mercury. Extended impact assessment*. Brussels, Commission of the European Communities, 2005 (Commission Staff Working Paper SEC(2005)101, http://ec.europa.eu/environment/chemicals/mercury/pdf/extended_impact_assessment.pdf#search=%22EU%20Extended%20Impact%20Assessment%20%20Mercury%22, accessed 13 February 2010).
21. *Levels of lead in children's blood*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS fact sheet 4.5).
22. *Health risks of heavy metals from long-range transboundary air pollution*. Copenhagen, WHO Regional Office for Europe, 2007.
23. Initiative to estimate the Global Burden of Foodborne Diseases [web site]. Geneva, World Health Organization, 2010 (http://www.who.int/foodsafety/foodborne_disease/ferg/en/index.html, accessed 12 February 2010).
24. *Harmonization of methods for assessment of EH policies in the Member States: report on a WHO working group*, Bonn, 22–23 May 2008. Copenhagen, WHO Regional Office for Europe, 2008 (<http://www.euro.who.int/Document/E92205.pdf>, accessed 12 February 2010).
25. FAO/WHO Food Standards. Codex Alimentarius [web site]. Geneva, World Health Organization and Rome, Food and Agriculture Organization, 2010 (http://www.codexalimentarius.net/web/index_en.jsp, accessed 13 February 2010).
26. *Assuring food safety and quality: Guidelines for strengthening national food control systems*. Geneva, World Health Organization and Rome, Food and Agriculture Organization, 2003 (http://www.who.int/foodsafety/publications/capacity/en/Englsh_Guidelines_Food_control.pdf, accessed 13 February 2010).
27. Food safety [web site]. Geneva, World Health Organization, 2010 (<http://www.who.int/foodsafety>, accessed 12 February 2010).
28. Food safety – from the farm to the fork [web site]. Brussels, European Commission, 2010 (http://ec.europa.eu/food/food/index_en.htm, accessed 13 February 2010).
29. Europa. Summaries of European legislation. Food hygiene [web site]. Brussels, European Union, 2007 (http://europa.eu/legislation_summaries/food_safety/veterinary_checks_and_food_hygiene/f84001_en.htm, accessed 13 February 2010).
30. Convention on Long-Range Transboundary Air Pollution [web site]. Geneva, United Nations Economic Commission for Europe, 2010 (<http://www.unece.org/env/lrtap/>, accessed 14 February 2010).
31. The role of health systems in chemical safety for eastern European, Caucasus and central Asian (EECCA) countries [web site]. Copenhagen, WHO Regional Office for Europe, 2009 (http://www.euro.who.int/chemsafety/News/20080401_1, accessed 13 February 2010).
32. *EU leading the way towards world mercury export ban*, press release. EEB/Zeromercury/Health & Environment alliance/Health care without harm, 2006 (<http://www.env-health.org/IMG/pdf/061025ExportBanRegAdoptionPR.pdf>, accessed 13 February 2010).
33. WHO European Action Plan for Food and Nutrition Policy [web site]. Copenhagen, WHO Regional Office for Europe, 2009 (http://www.euro.who.int/eprise/main/WHO/Progs/fos/Assistance/20070115_1?language=, accessed 13 February 2010).
34. Convention on Long-Range Transboundary Air Pollution. The 1998 Aarhus Protocol on Heavy Metals [web site]. Geneva, United Nations Economic Commission for Europe, 2010 (http://www.unece.org/env/lrtap/hm_h1.htm, accessed 13 February 2010).
35. UNEP Strategic Approach to International Chemicals Management [web site]. Geneva, SAICM Secretariat, 2010 (<http://www.saicm.org/index.php?ql=h&content=home>, accessed 13 February 2010).

36. *Strategic approach to international chemicals management*: report by the Secretariat. Geneva, World Health Organization, 2010 (WHO Executive Board 126th Session, Geneva, 18–23 January 2010) (http://apps.who.int/gb/ebwha/pdf_files/EB126/B126_20-en.pdf, accessed 12 February 2010).
37. Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. *Official Journal*, 13/02/2003, L 037: 0019–0023 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0095:EN:HTML>, accessed 13 February 2010).
38. Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE). *Official Journal*, 13/02/2003, L 37: 24–38 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:037:0024:0038:EN:PDF>, accessed 13 February 2010).
39. EPER. The European Pollutant Emission Register [web site]. Copenhagen, European Environment Agency, 2010 (<http://www.eper.ec.europa.eu/eper/>, accessed 13 February 2010).
40. Kiev Protocol on Pollutant Release and Transfer Registers [web site]. Geneva, United Nations Economic Commission for Europe, 2010 (<http://www.unece.org/env/pp/prtr.htm>, accessed 13 February 2010).
41. Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. Geneva, United Nations Economic Commission for Europe, 2010 (<http://www.unece.org/env/pp/documents/cep43e.pdf>, accessed 13 February 2010).

Environmental noise

Noise has emerged as the leading environmental nuisance in Europe, and excessive noise is an increasingly common public complaint.

Exposure to environmental noise and its health effects

Environmental noise is one of the most frequently complained about environmental hazards in Europe. In the EU member states, Iceland, Norway, Switzerland and Turkey, one in four households reports being annoyed by noise from neighbours or from the street (1), with the percentage of the population complaining about noise ranging from 12% (in Hungary, Iceland, Ireland and Norway) to 31% (in Cyprus and Romania). People so exposed are at risk of adverse health impacts such as annoyance, sleep disturbance, learning impairment, cardiovascular disorders, hearing impairment and tinnitus. No notable decrease in the percentage of the population at risk was apparent in the countries surveyed during the period 2004-2008.

A good night's sleep is essential for health and well-being. Night-time noise disturbs normal sleep patterns and diminishes the quality of sleep. According to the strategic noise mapping database (2), one in five persons living in relatively large cities (>250 000 inhabitants) is exposed to a night noise level higher than 55dB L_{night} – the noise indicator for night time as defined by the EU directive on environmental noise of 2002 (3) and the interim target of WHO's *Night noise guidelines for Europe* (4) (Fig. 56). Exposure to noise levels higher than the interim target level is dangerous for public health: adverse health effects occur frequently, and a sizeable proportion of the population is highly annoyed and suffers sleep disturbance. There is epidemiological evidence that the risk of cardiovascular disease increases at this high level of exposure.

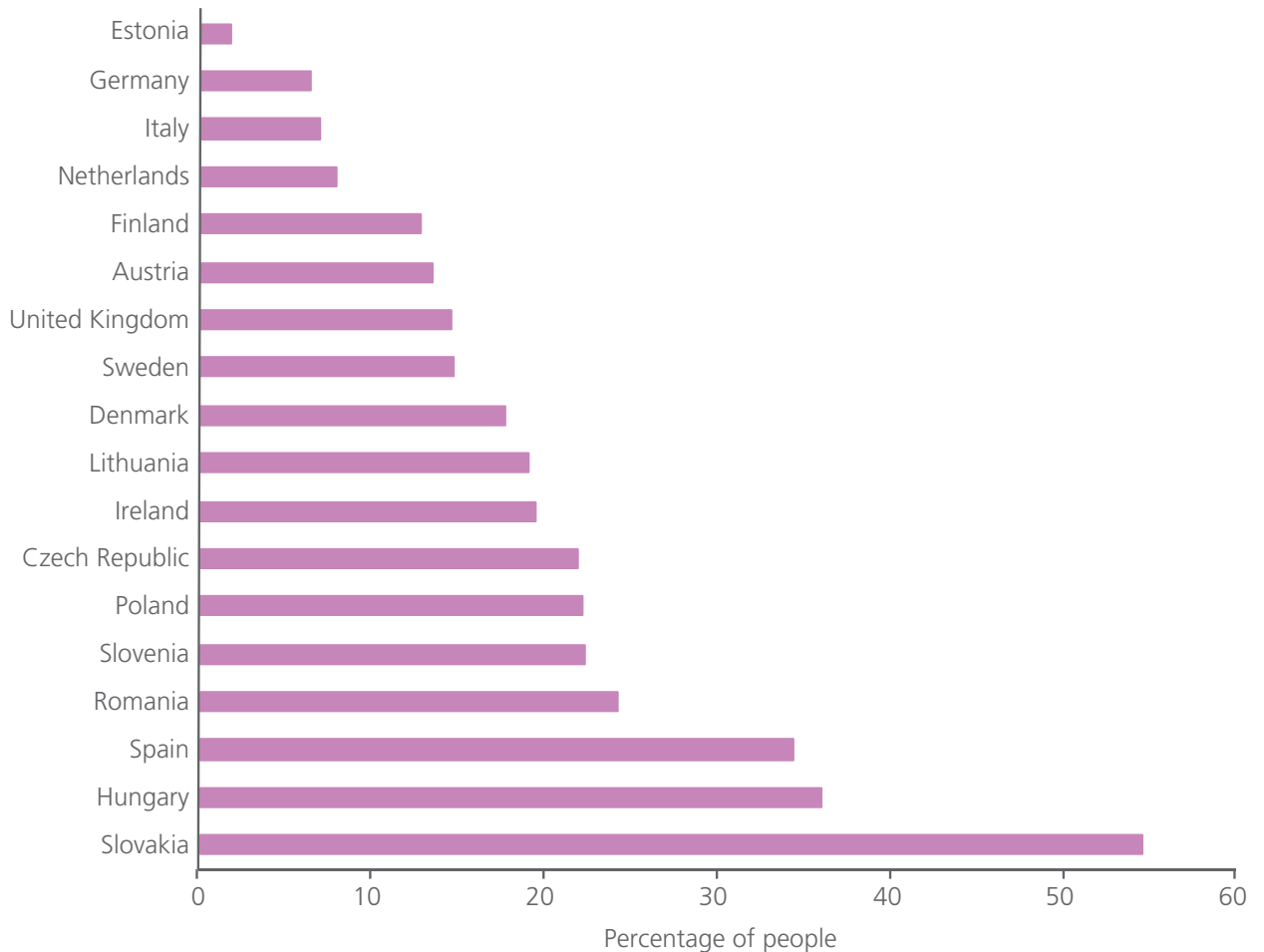
According to the preliminary results of the multinational Environmental Burden of Disease in Europe pilot project, environmental noise is the third largest environmental burden of disease (after ambient air pollution and exposure to SHS in six European countries), as expressed in DALYs (5).

Strategic noise mapping data show remarkable variations in the percentages of populations exposed to high levels of noise, both between cities and between countries. Specific data concerning population exposure to noise from airports also show large differences resulting from location and type of aircraft. These variations indicate that substantial improvements can come from appropriate remediation action by local and central governments.

Member States are encouraged to develop and implement action plans to reduce the proportion of

their populations exposed to levels over the interim target ($L_{night}=55\text{dB}$) in the context of meeting wider sustainable development objectives. It is highly recommended that risk assessment and management activities should be carried out at local and national levels. These should target the exposed population, and aim to reduce night noise to the levels recommended by WHO in its night noise guidelines.

Fig. 56. Percentage of people exposed to a night noise level of $L_{night} >55\text{dB}$ from roads in European agglomerations with populations of $\geq 250\,000$



Note. L_{night} is the noise indicator for night time as defined by the EU directive on environmental noise (3).

Source: European Environment Agency (2).

Policies on environmental noise

Noise policies differ widely among different European country groups (Fig. 57). While the number of policies covering noise might be substantial, their implementation and enforcement, involvement of the health sector and health accountability are weak in EurG-C countries, and not particularly good in other country groups.

Public governance

It is not unexpected that EurG-A and EurG-B countries generally have noise pollution policies covering a wider range of key issues than EurG-C and EurG-D countries (Fig. 58). However, fewer than half of the European countries have policies dealing directly with the reduction of health risks or the prevention of noise.

Fig. 57. Policy profile for environmental noise, by country grouping

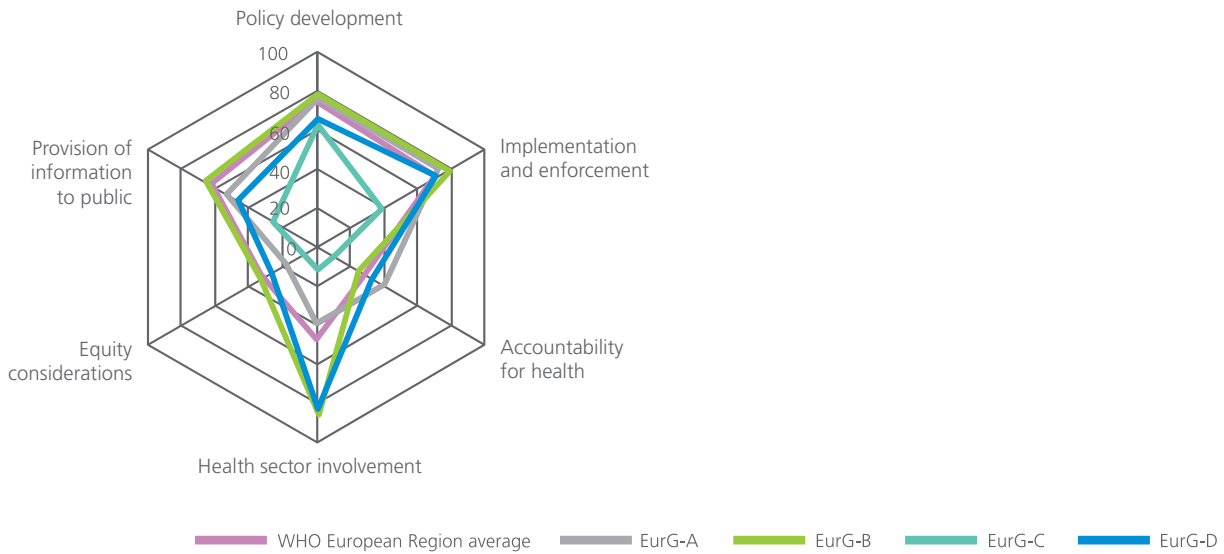
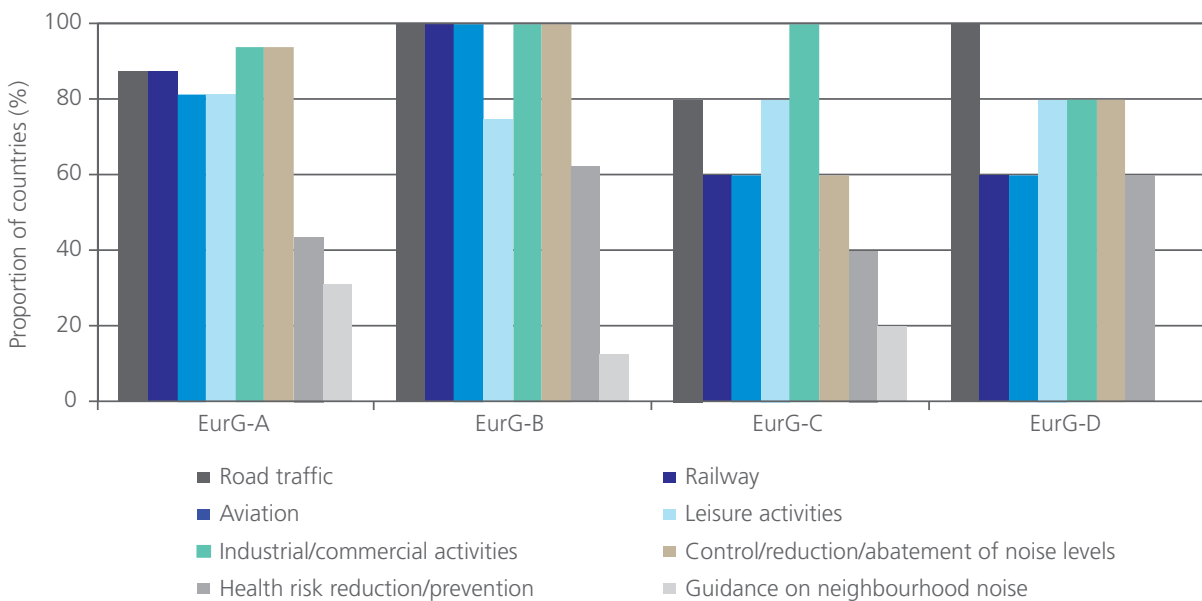


Fig. 58. Scope of policy measures on noise, by country grouping



Most EurG-A and EurG-B countries reported that their environmental noise regulations were enforced, mainly because of recent EU legislation in the field. It is striking that enforcement was rarely reported from any EurG-C country, perhaps reflecting a lack of policy attention given to noise in these countries. Remarkably, no EurG-C country has yet published a report describing the health risks of environmental noise.

Legislation is the most common policy instrument for dealing with noise throughout Europe. Other instruments, such as action plans, only exist in a limited number of countries (Fig. 59).

Non-compliance measures differ among country groups (Fig. 60). In the EU, more emphasis is put on control activities. The questionnaire did not list the development of action plans as an option in the case of non-compliance. EU legislation does, however, give member states an opportunity to address local

noise issues by drawing up action plans to reduce noise where necessary and maintain environmental noise quality where it is good (3).

Fig. 59. Policy instruments deployed to combat noise

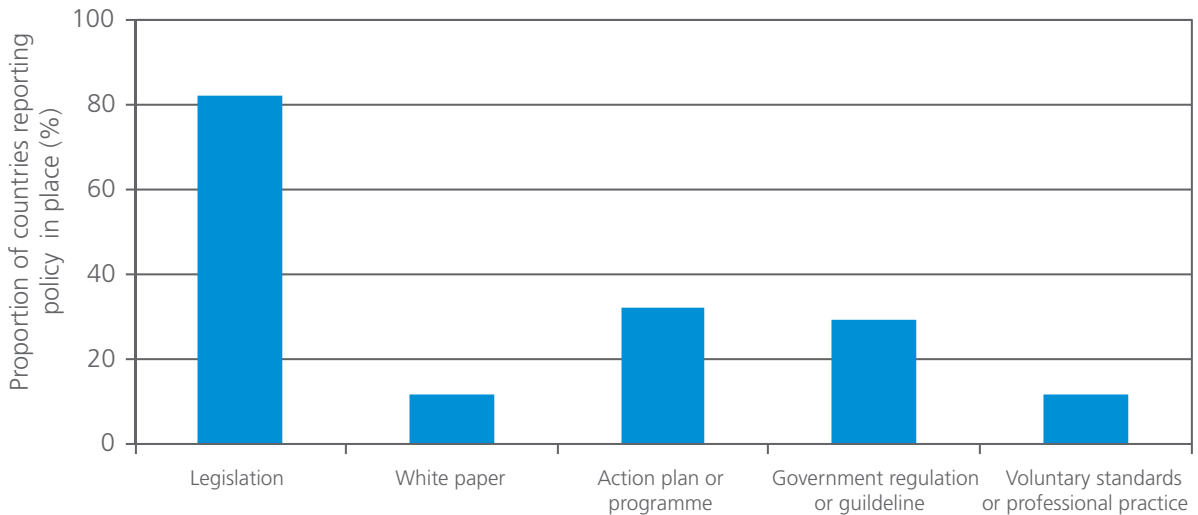
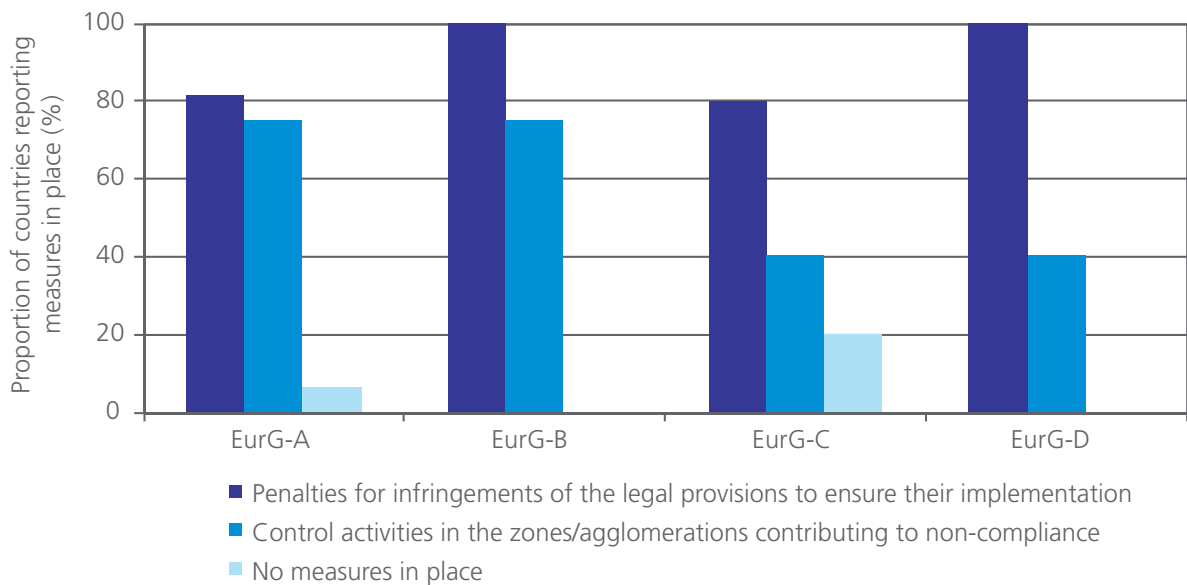


Fig. 60. Measures to ensure policy compliance for noise, by country group



The first EU directive on environmental noise was a relatively modern policy instrument, requiring the competent authorities in member states to produce strategic noise maps on the basis of harmonized indicators, to inform the public about exposure to noise and its effects, and to draw up action plans to address issues related to noise. This directive, together with the establishment of European expert networks and a renewed focus on engine and tyre technology in relation to noise, have put noise higher on the European environmental health agenda.

After several years of effort, the Regional Office has also developed guidelines for night noise to help countries recognize and address issues related to noise and health. The guidelines present groundbreaking evidence of the damage that exposure to night noise can have on people's health. They

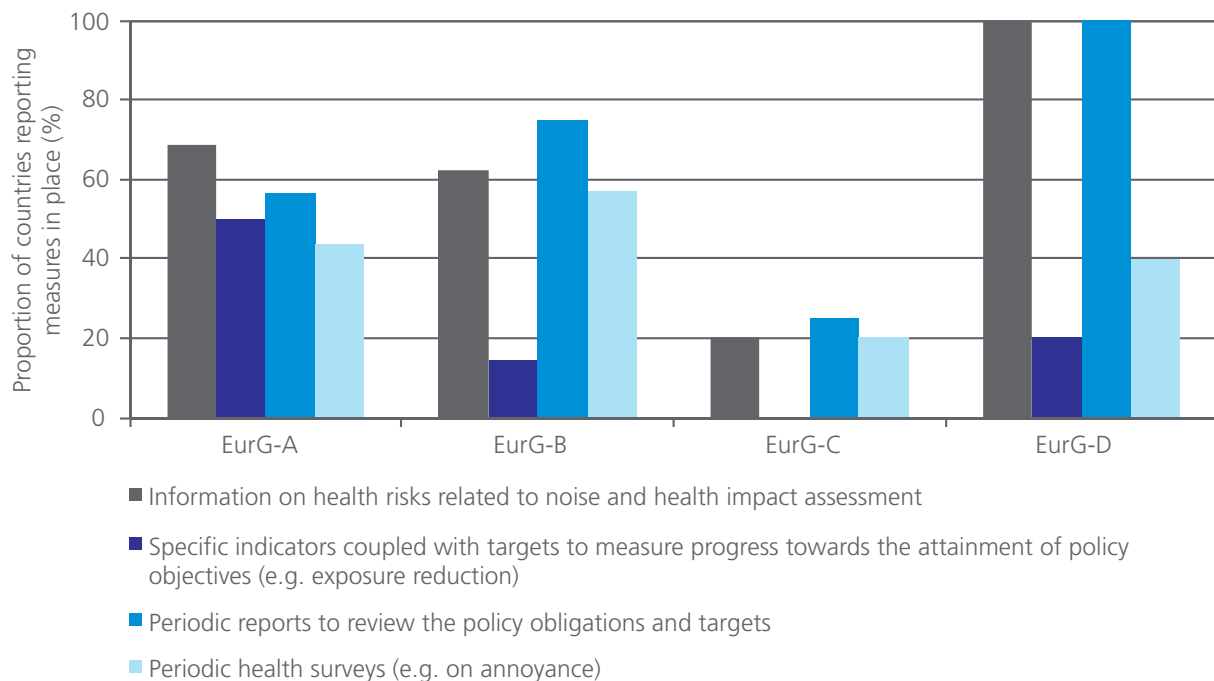
also provide recommendations to countries for introducing night noise limits, thus supporting the implementation of the EU Directive which requires countries to map hotspots of noise and reduce exposure but does not set any limit values.

Healthy public policy

Noise has not traditionally been high on the healthy public policy agenda. This is evident in the answers from different country groups, even if some of the results from EU member states could be considered the results of the integration of noise policies into other sectors. The score in EurG-C countries is particularly low.

There are differences in various national approaches to health accountability (Fig. 61). Some EurG-A and EurG-B countries have chosen a variety of measures to monitor progress towards policy targets. EurG-D countries, on the other hand, place greater emphasis on disseminating information about the health risks and publishing periodic reports on noise as an environmental health problem. Notably, the survey results from EurG-D countries do not correspond with European noise data published so far, nor with other data reported in the same survey. Periodic reports on noise issues, published in EurG-D countries, are quite rare.

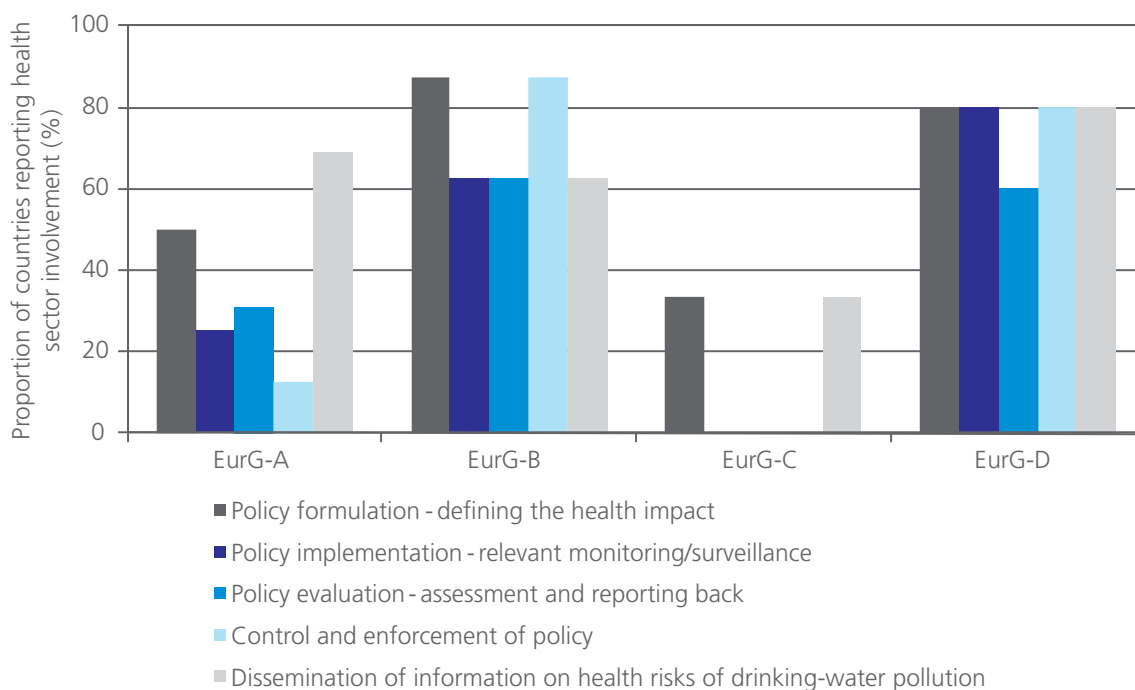
Fig. 61. Health accountability measures for noise policies, by country grouping



The involvement of the health sector in noise-related policies is seen particularly in EurG-B and EurG-D countries, where the health sector has wide responsibilities from policy formulation and implementation to control, evaluation and dissemination of information. For EurG-A countries, this responsibility lies, to a larger extent, with other sectors. For EurG-C countries, it is unclear whether any responsibility for noise exists in any country (Fig. 62).

EurG-B countries have put more emphasis on equity in their noise policies than the other country groups. In these countries, policies focus more on groups at serious risk from high noise levels and children. Noise may to a certain extent be considered a universal issue, involving the promotion of noise-free environments for all. On the other hand, in order to start work on reducing the risks of noise to health, it will be necessary to give priority to certain areas or groups at risk.

Fig. 62. Reported health sector involvement in noise policy, by country grouping



Transparency and communication

The lack of publicly available noise maps and of other information on noise explains the low score of the EurG-C and EurG-D countries. For EurG-A and EurG-B countries, the Noise Observation and Information Service for Europe (NOISE) (2) database provides, through the European Environment Agency, a picture of the number of people exposed to noise generated by air, rail and road traffic across Europe and in 102 large urban agglomerations. Compiling information from 19 of the 32 European Environment Agency member countries, the NOISE database represents a major step towards a comprehensive pan-European service.

Information on noise and health in the eastern part of the Region is generally unacceptably poor. There is a lack of relevant published information regarding current exposure and effects, the distribution of effects and mitigation measures. Noise policies are under development. The most promising tool so far is the EU directive on environmental noise with its noise maps. The international regulations on noise sources have succeeded in limiting transport-related emissions such as noise from lorries, outdoor machinery, aeroplanes and trains. Some progress on tyre noise has been made as well as on motorcycles.

References

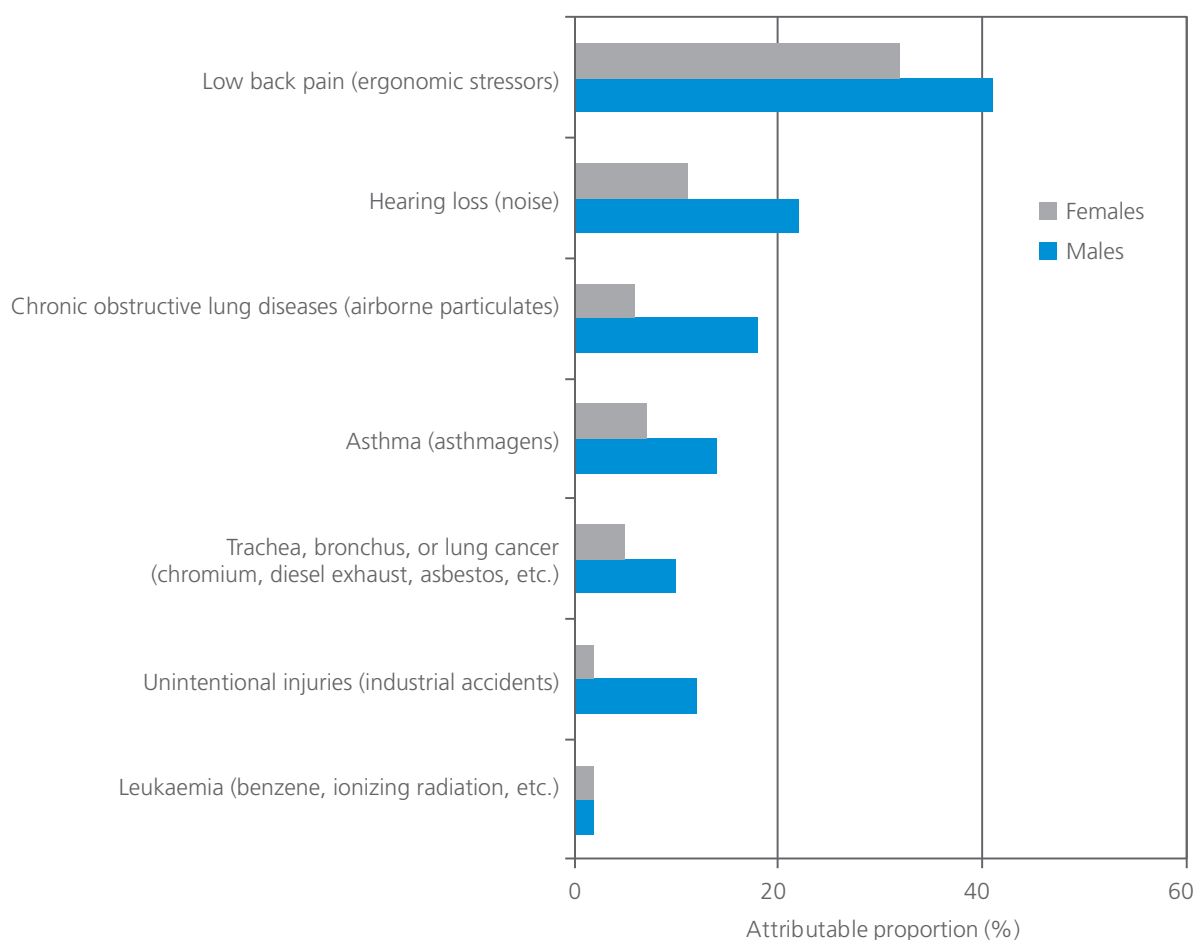
1. Noise from neighbours or from the street [online database]. Brussels, Eurostat, 2010 (http://nui.epp.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_mddw01&lang=en, accessed 13 February 2010).
2. Noise Observation and Information Service for Europe – NOISE [web site]. Copenhagen, European Environment Agency, 2010 (<http://noise.eionet.europa.eu>, accessed 13 February 2010).
3. The directive on environmental noise [web site]. European Brussels, European Commission, 2008 (2002/49/EC, <http://ec.europa.eu/environment/noise/directive.htm>, accessed 13 February 2010).
4. *Night noise guidelines for Europe*. Copenhagen, WHO Regional Office for Europe, 2009 (http://www.euro.who.int/InformationSources/Publications/Catalogue/20090904_12, accessed 13 February 2010).
5. Ranking of environmental stressors by health impact in Europe (EBoDE pilot) [web site]. Opasnet, 2010 (<http://en.opasnet.org/w/EBoDE>, accessed 13 February 2010).

Occupational health

Work-related health problems

The health and safety of European populations are significantly affected by their working environments. According to the Labour Force Survey (1), 8.6% of workers in the EU member states have experienced a work-related health problem and 3.2% have had one or more accidents resulting in injury in the 12 months preceding the survey. Musculoskeletal disorders and mental disorders are the most common self-reported work-related health problems in the United Kingdom (2). According to the WHO analysis, between 3% and 30–40% of some widespread diseases can be attributed to occupational health hazards (Fig. 63) (3).

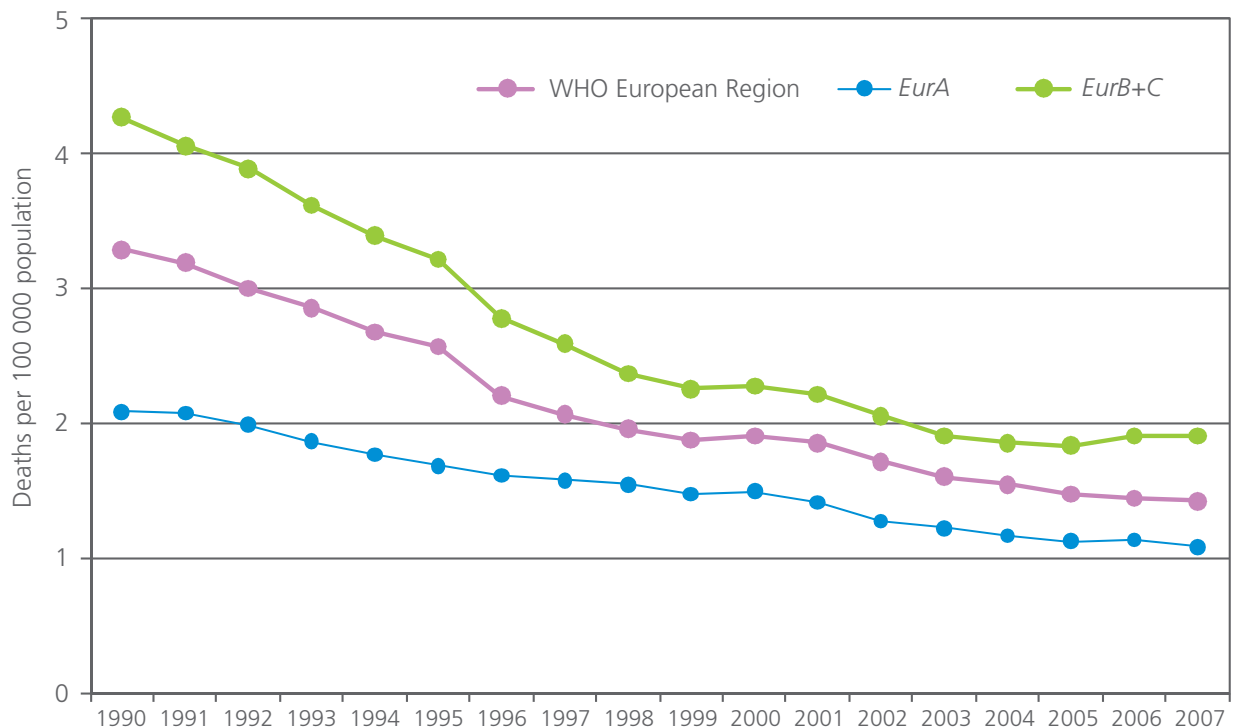
Fig. 63. Percentage of selected diseases and injuries attributable to occupational causes (listed in brackets)



Source: World Health Organization (3).

Differences in the classification of occupational morbidity make intercountry comparisons of most occupational diseases difficult. Relatively reliable data on mortality due to work-related accidents do, however, show a 50% decrease in the average death rate in the Region between 1990 and 2007 (Fig. 64) (4). These data also show a substantial gap between mortality in the *EurA* and *EurB+C* regions. The gap narrowed from over 100% in 1990 to 75% in 2008 (5). This positive trend in the health indicators has to a large extent been the result of better health and safety conditions at work (6). Such improvements were perceived by 57% of adults in the EU who were interviewed in June 2009 (7), although the perception of improvements ranged widely between countries, from 15% in Bulgaria to 83% in Ireland.

Fig. 64. Death rates due to work-related accidents in the WHO European Region, 1990–2007



Source: WHO Regional Office for Europe (4).

Young workers run a 50% higher risk of a non-fatal workplace accident or injury than older workers (8). This arises from lack of experience, immaturity or a limited awareness of existing or potential risks. Moreover, working methods, tools and equipment are normally designed for adults, exposing young people to a greater risk of fatigue, injury and accidents.

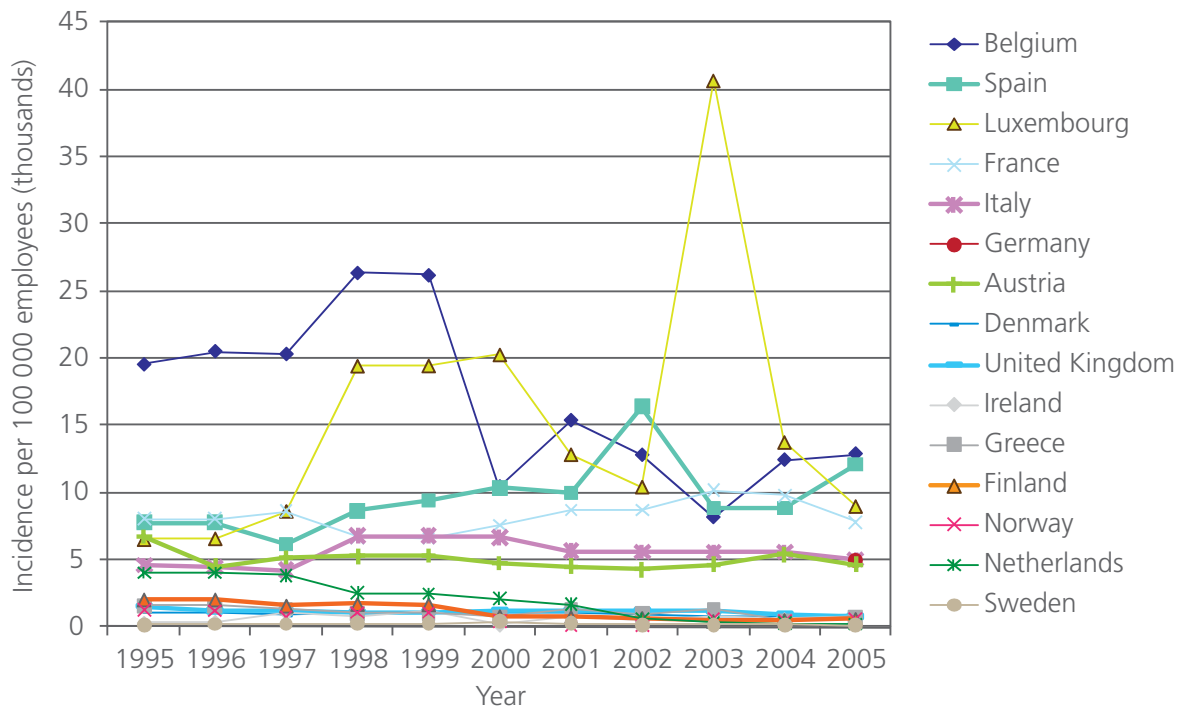
From the population health point of view, young workers constitute a small but important part of the total workforce. There are some 20 million workers aged 15–24 years in the EU (8). Accidents were most frequent among the group aged 15–24 years, while other work-related health problems were least frequent in this group. This section considers their health and working conditions in Europe, and in doing so draws on data for non-fatal work injuries. Using these data, an overview is given of the health implications of a broader range of work-related hazards.

Adverse health effects are generally more persistent and severe when exposure occurs during childhood, owing to the higher sensitivity of children’s developing organs to toxic agents and other workplace hazards. Various diseases, including chronic musculoskeletal disorders, have serious implications for work-related diseases during later life. These long-term consequences of workplace hazards on the future health of young workers are not captured by the data on the incidence of work-related injuries among young people.

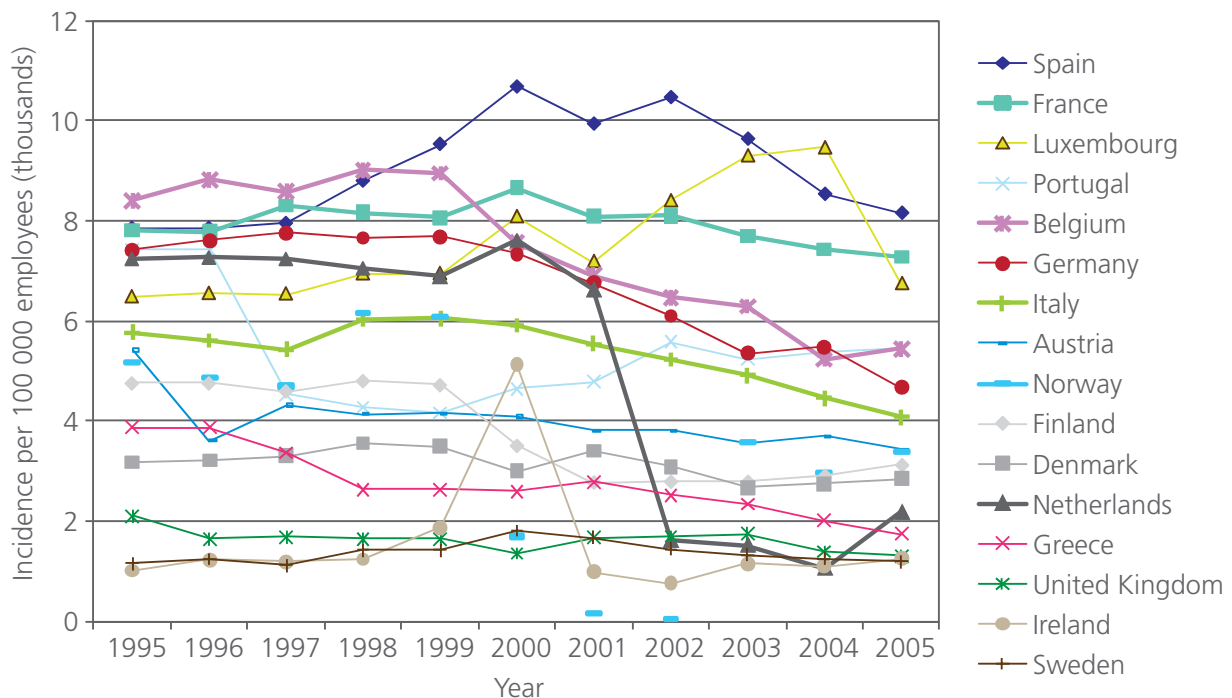
Between 1995 and 2005, there were no, or only slightly declining, trends in the standardized incidence of work injuries in employees aged under 18 years and 18–24 years (Fig. 65) (8). In most countries, this trend was more noticeable in the group aged 18–24 years. In both age groups, the rates of injury varied substantially between countries. Reporting systems are not, however, fully standardized, which should be borne in mind when interpreting the data.

Fig. 65. Incidence of work injuries among employees aged under 18 years and 18–24 years, 1995–2005 (standardized incidence rates)

A. Employees aged under 18 years



B. Employees aged 18-24 years



Source: WHO Regional Office for Europe (8).

Child labour is relatively underreported owing to the lack of reliable information about the number of child workers, especially in WHO Member States in eastern Europe, the Caucasus and central Asia. Reports from UNICEF and the International Labour Organization (ILO) indicate that the magnitude and seriousness of child labour is of significant concern in certain part of the Region. The worst forms of

child labour should be considered a serious public health problem, according to ILO Convention 182 (9), because they can result in injuries and premature death as well as in loss of opportunities for education and social development.

Policy considerations

Member States are urged to establish specific programmes for occupational health and safety, giving particular attention to young workers. CEHAPE's regional priority goal IV aims to reduce the risk of disease and disability arising from, among other things, hazardous working environments during pregnancy, childhood and adolescence. The Plan also emphasizes the elimination of the worst forms of child labour (10). Both the WHO Global Strategy on Occupational Health for All (11) and the WHO Global Plan of Action on Workers' Health recognize child workers and young employees as high-risk groups and recommend the elimination of hazardous forms of labour (12).

According to the EC Directive on the Protection of Young People (94/33/EC), employers in EU member states are obliged to guarantee that work is not harmful to the safety, health or development of young people as a consequence of their lack of experience or awareness of existing or potential risks, or the fact that their body systems are not yet fully mature. Vocational guidance or training programmes should be available (13).

Almost all WHO European Member States have ratified ILO Convention No. 182 on the Worst Forms of Child Labour Convention (1999) (9) and ILO Convention No. 138 on the Minimum Age (1974) (14), and major progress has been made towards the elimination of the worst forms of child labour. There are, however, still problems, including hazardous work, prostitution and other "worst forms" of child labour within the Region. The seven million adolescents aged 15–17 years who are legally employed in the Region require special protection to ensure that their health, safety, morals and schooling are not jeopardized.

The protection of children and young people at work requires health and safety promotion campaigns to raise the awareness of employers, young employees and their parents about occupational health hazards. These campaigns should be complemented by health education and training for young people at work. Moreover, there is a need to monitor the effectiveness of campaigns, legislation and enforcement action.

References

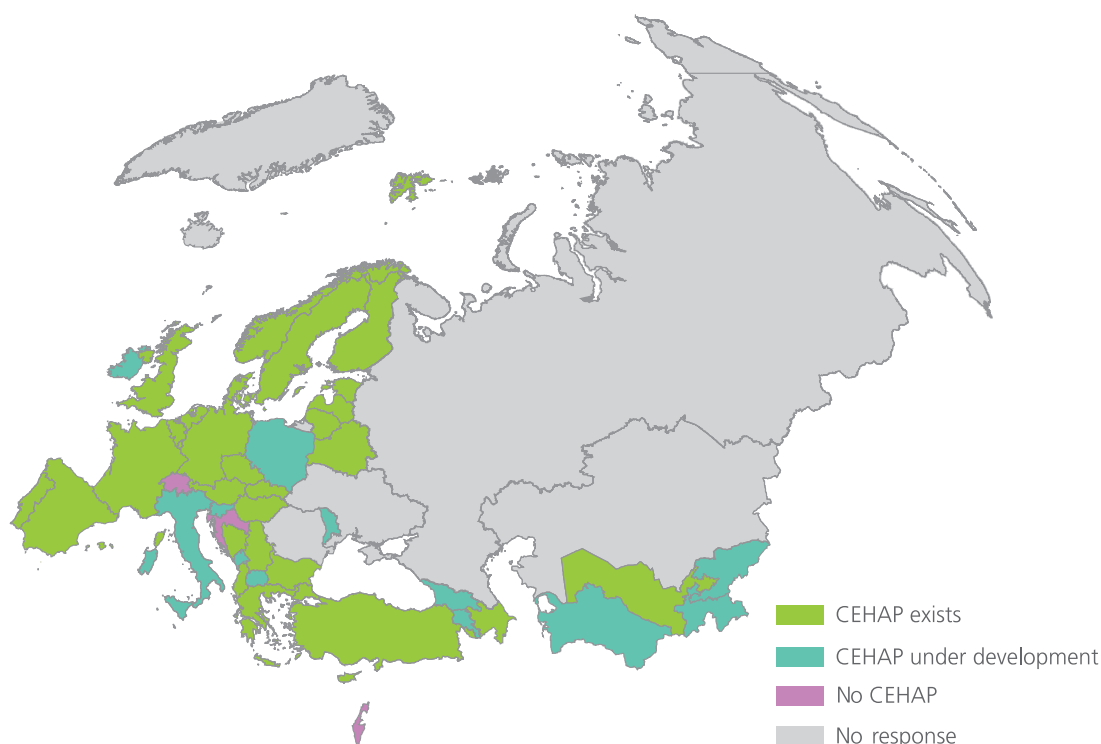
1. 8.6% of workers in the EU experienced work-related health problems: Results from the Labour Force Survey of 2007 ad hoc module on accidents at work and work-related health problems. *Eurostat Statistics in Focus*, 2009, 63 (http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-063/EN/KS-SF-09-063-EN.PDF, accessed 10 February 2010).
2. *Self-reported work-related illness and workplace injuries in 2007/2008: Results from Labour Force Survey*. London, Health and Safety Executive, 2009 (<http://www.hse.gov.uk/STATISTICS/lfs/lfs0708.pdf>, accessed 10 February 2010).
3. *Comparative quantification of health risks*. Geneva, World Health Organization, 2004 (http://www.who.int/healthinfo/global_burden_disease/cra/en/, accessed 10 February 2010).
4. Health for all database [online database]. Copenhagen, WHO Regional Office for Europe, 2010 (<http://www.euro.who.int/HFADB>, accessed 11 February 2010).
5. Hämmäläinen P, Takala J, Saarela KL. Global trend according to estimated number of occupational accidents and fatal work-related diseases at region and country level. *Journal of Safety Research*, 2009, 40:125–139.
6. Takala J et al. The global and European work environment – numbers, trends, and strategies. *Scandinavian Journal of Work Environment and Health*, 2009, Suppl.7:15–23.
7. Takala J. *Economic crisis and safety and health at work – global and European trends*. Düsseldorf, A+A, 2009 (<http://www.ilosafetyconference2009.org/resources/Presentations/Conference/Session4/Takala.ppt> accessed 10 February 2010).
8. *Work injuries in children and young people*. Copenhagen, WHO Regional Office for Europe, 2009 (ENHIS Fact Sheet 4.7).
9. *Convention No. 182 Concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour*. Geneva, International Labour Organization, 1999 (<http://www.ilo.org/public/english/standards/relm/ilc/ilc87/com-chic.htm>, accessed 11 February 2010).
10. *Children's Environment and Health Action Plan for Europe. Fourth Ministerial Conference on Environment and Health*,

- Budapest, 23–25 June 2004* (EUR/04/5046267/7) (<http://www.euro.who.int/document/e83338.pdf> accessed 11 February 2010).
11. *Global strategy on occupational health for all*. Geneva, World Health Organization, 1995 (http://www.who.int/occupational_health/en/oehstrategy.pdf, accessed 10 February 2010).
 12. *Workers' health: global plan of action*. Geneva, World Health Organization, 2007 (http://www.who.int/occupational_health/WHO_health_assembly_en_web.pdf, accessed 11 February 2010).
 13. EC Council Directive 94/33/EC of 22 June 1994 on the protection of young people at work. *Official Journal*, 20.8.1994, L216:12–20 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31994L0033:en:html> accessed 10 February 2010).
 14. *Minimum Age Convention*. Geneva, International Labour Organization, 1973 (Convention No. 138, <http://www.ilo.org/ilolex/cgi-lex/convde.pl?C138>, accessed 11 February 2010).

Implementing the Children's Environment and Health Action Plan for Europe: the role of intersectoral collaboration

As part of the follow-up to the Budapest Conference commitments, many Member States prepared national children's environment and health action plans. To assess the status of and challenges in the integrated policy action on children's health and environment, the Regional Office conducted a survey in the Member States in the autumn of 2009. A total of 42 Member States¹ responded to the CEHAPE survey (Annex 1); four further countries responded after the deadline (marked on the map in Fig. 66 but not included in the analysis).

Fig. 66. National CEHAP programmes across the WHO European Region



Note. Based on responses from 46 countries; data from 4 countries arrived too late to be used in the analysis.

1 Respondent countries by EurG grouping:

- EurG-A: Andorra, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Switzerland and the United Kingdom;
- EurG-B: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia;
- EurG-C: Albania, Bosnia and Herzegovina, Croatia, Israel, Serbia, The former Yugoslav Republic of Macedonia and Turkey;
- EurG-D: Armenia, Azerbaijan, Kyrgyzstan, Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan.

National CEHAP programmes

Overall, 38 out of 42 Member States have either developed (n=28) or are currently developing (n=10) national children's environment and health action plans (Fig. 66). However, while EurG-A, B and C countries mostly have their national CEHAPs ready, many countries in EurG-D are still developing them.

Across the Region, national CEHAPs are predominantly (74%) a part of existing national environment and health action plans (NEHAP) or other national policies and action plans, rather than stand-alone action plans. The vast majority of existing and developing CEHAPs are national in scope while also including strong sub-national components.

Only half of the participating countries are involving young people in developing their national CEHAP programmes for action to safeguard children's health and environment. Young people have been involved in the development of CEHAPs in at least half of the EurG-C and EurG-D countries, but much less frequently in EurG-A and EurG-B countries.

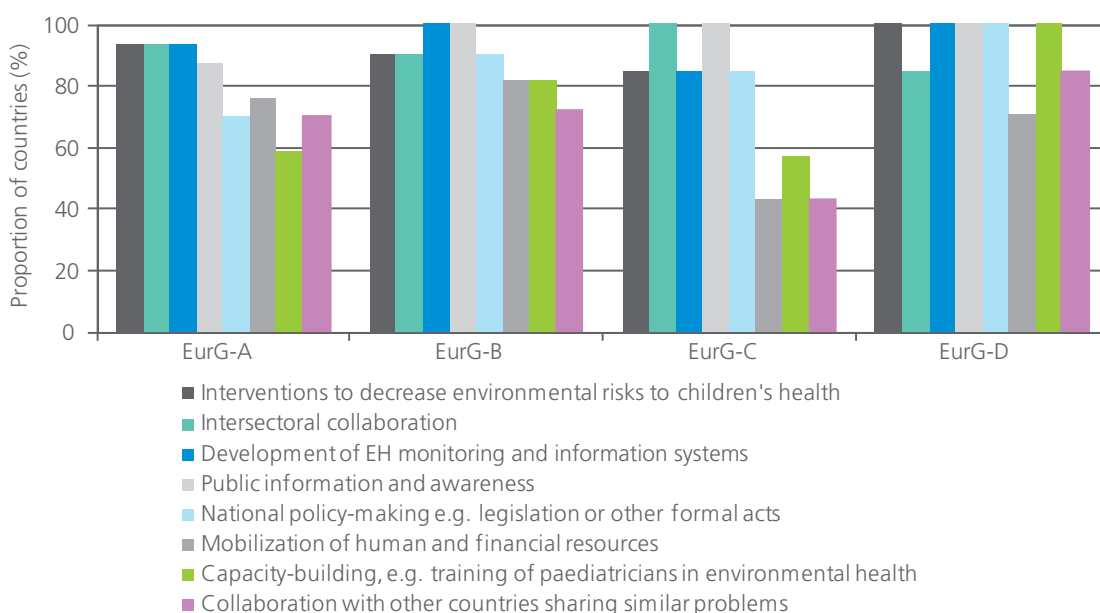
The level of implementation of existing CEHAPs varies across the Region, with about 70% of respondents reporting medium or high levels. EurG-A and EurG-B countries reported mainly medium to high implementation rates, while countries in EurG-C and EurG-D assessed implementation as either medium or low.

Since the adoption of the CEHAPE in 2004, Member States have reported a wealth of national developments in the field of environment and health as a contribution to achieving the four regional priority goals. Most countries (60%) addressed all four goals, while some focused their efforts on a few national priorities. Policy measures range from legislation (including, for example, harmonization with EU legislation), action plans and strategies to research initiatives, awareness-raising campaigns, monitoring of exposure, health surveillance, health promotion programmes, etc.

Impact of CEHAPE

According to an assessment made by the environment and health focal points in Europe, the CEHAPE as a European policy platform has had a broad range of impacts at national and sub-national levels across the Region. It has stimulated coordinated action on children's health that cuts across departmental and sectoral boundaries and involves different levels of government in countries (Fig. 67).

Fig. 67. Policy action areas positively influenced by the CEHAPE, by country grouping



CEHAPE has positively influenced interventions to decrease environmental risks to children’s health (90%), development of EH information and monitoring systems (95%), public information and awareness (95%), national policy-making (80%) and intersectoral collaboration (90%). Improvements in intersectoral collaboration have mainly occurred between the health and environment sectors, followed by transport and education. Interestingly, CEHAPE seems to have strongly influenced countries in the EU and western Europe to develop national CEHAPs. CEHAPE has also prompted action on the regional and local scale in 60% of countries.

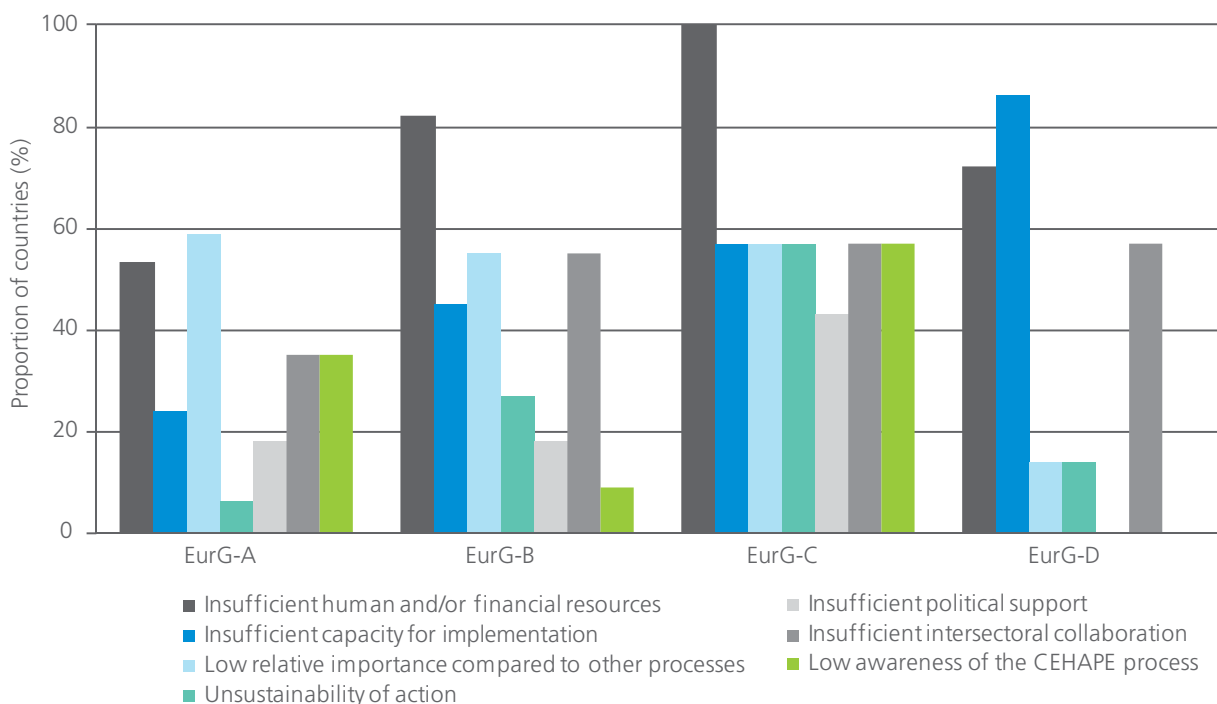
Across the Region, the policy areas least influenced by CEHAPE were (i) collaboration with other countries sharing similar problems and (ii) the mobilization of human and/or financial resources: one quarter of the responding countries failed to mobilize such resources for EH issues.

Challenges in implementing CEHAPE

While the challenges in implementing the CEHAPE nationally vary from country to country (Fig. 68), they are found in all the groups of countries and include the following.

- Insufficient human and/or financial resources are the most commonly reported challenge (70%) which, together with insufficient capacity to implement the plans, underlines that the continued commitment of all partners is urgently required for successful CEHAPE implementation in the countries.
- Low relative importance compared to other policy processes makes it difficult to focus on implementation in half of the countries (although this is not the case in EurG-D countries).
- Despite the positive influence of CEHAPE in bringing together diverse sectors and stakeholders, inadequate intersectoral collaboration continues to be a challenge to EH action in as many as half of the countries in the Region.
- Low awareness about the CEHAPE process is reported by a quarter of the countries.
- Unsustainable action within the time-frame of specific activities prevents long-term improvements in environment and health in 20% of countries.
- Insufficient political support in 20% of countries is an obstacle for putting in place integrated action.

Fig. 68. Main challenges in taking action under the CEHAPE, by country grouping



There is a steep east-west gradient, with the lowest capacity available for implementation in the newly independent states. Furthermore, insufficient intersectoral collaboration also hinders CEHAPE implementation across the Region, although this is much less of a problem in EurG-A than in the other groupings.

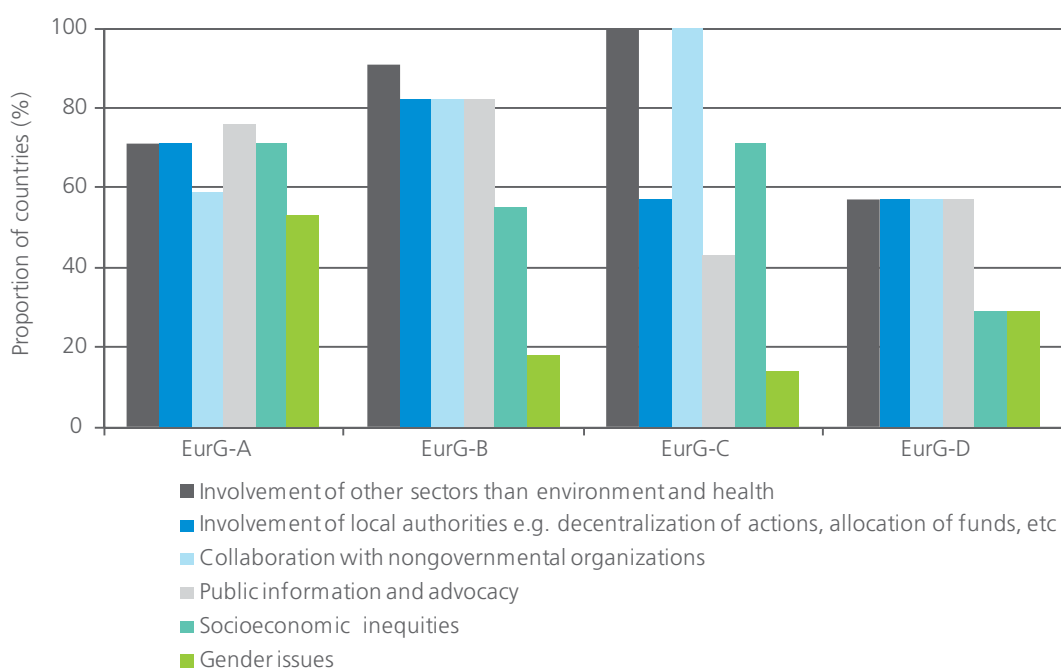
WHO support to CEHAPE implementation

As a consequence of the above-mentioned gradient across countries in their capacity to deal with EH issues, requests for WHO support for activities in this field were particularly frequent from EurG-B, EurG-C and EurG-D countries. This was, however, mainly in regard to the planning of action.

Addressing cross-cutting issues

In anticipation of the Fifth Ministerial Conference on Environment and Health in 2010, many countries have already begun addressing cross-cutting issues in their national policy-making processes on environment and health (Fig. 69). These include collaboration with other stakeholders, socioeconomic inequalities, public information and advocacy, involvement of sectors other than environment and health, gender issues and involvement of local authorities (for example, through the decentralization of action, allocation of funds and enabling of local decision-making). There is a general trend across the Region towards involving sectors other than environment and health, such as local authorities, and collaboration with new stakeholders such as nongovernmental organizations. Gender issues remain, however, rather low on the policy agenda (only one third of the countries considered them) and not enough attention is paid to socioeconomic inequities, particularly in the newly independent states. Public information and advocacy issues were mostly considered in the western part of the Region and the EU12 countries.

Fig. 69. Cross-cutting issues of relevance to children’s environment and health already being addressed in national policy processes, by country grouping



Member States made the following main recommendations for strengthening CEHAPE and its impact in the countries:

- the regional priority goals should be revised to reflect emerging and cross-cutting issues as well as sub-national priorities;

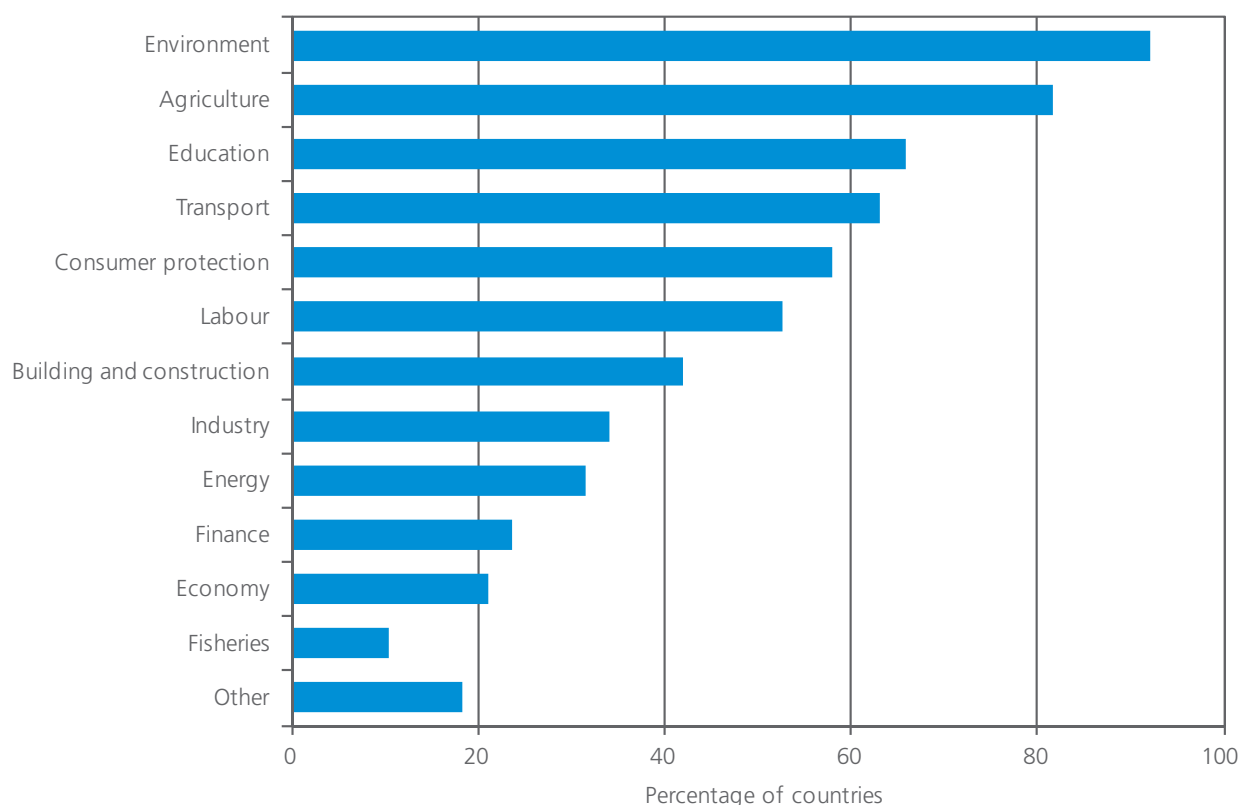
- tools should be prepared for evidence-based action as part of CEHAPE;
- exchange of experience should be fostered on initiatives to improve children’s environment and health;
- the integration of CEHAPE in other international processes should be improved; and stronger leadership and technical support should be provided by WHO (especially in EurG-B, C and D).

As already noted, implementing CEHAPE involves a wide range of economic and governmental sectors, so that intersectoral collaboration is of paramount importance. The following section provides insight into existing country structures and mechanisms for intersectoral collaboration, based on the WHO EH policy survey.

Intersectoral collaboration on health

All Member States reported the involvement of different economic and governmental sectors in health-related policy programmes. The majority of integrated country policy programmes connect environmental topics to relevant health issues such as the NEHAP, CEHAP and environmental action plans, thus bringing together the environment and health sectors. Agriculture, education and transport are other sectors commonly involved in health-related integrated policy programmes (Fig. 70). EurG-C countries reported a high rate of programmes involving the labour sector, and EurG-D countries reported the highest rate of involvement of the industrial sector.

Fig.70. Sectors involved in health-related intersectoral programmes in the countries



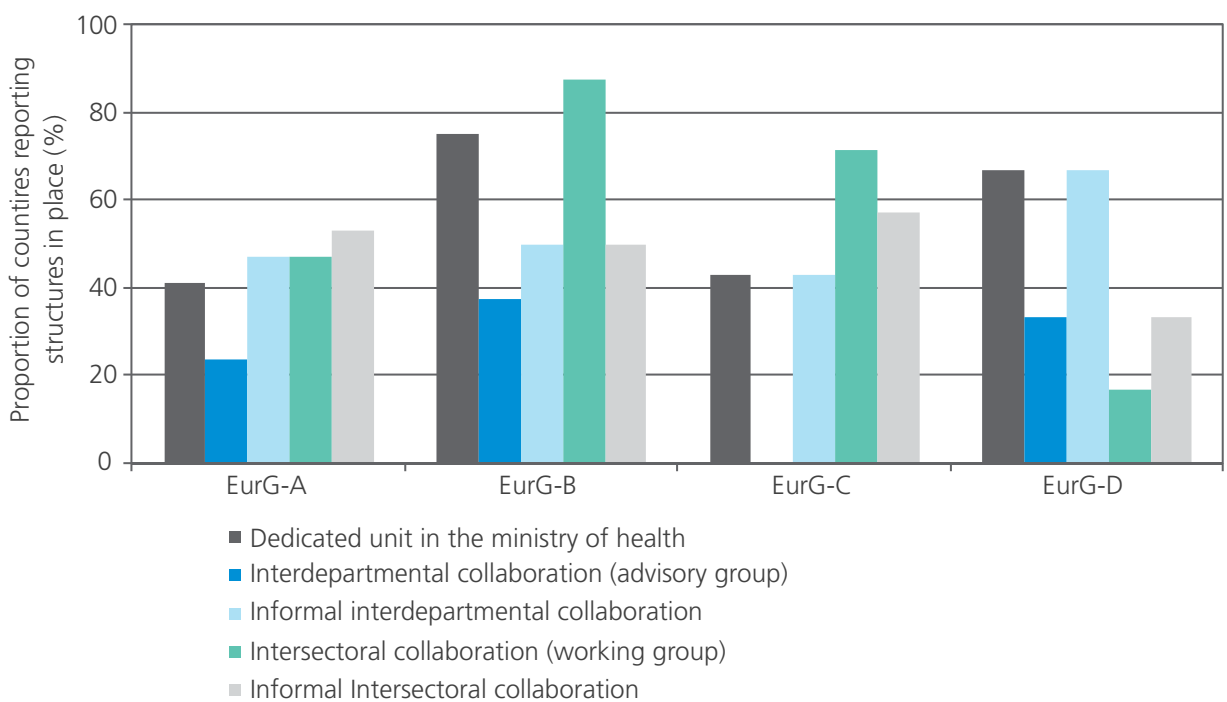
Note: Other includes interior, justice, youth, family and elderly, nongovernmental organizations, local authorities, etc.

Almost all countries have organizational arrangements in place to facilitate the working relationships between government bodies and stakeholders. Structures for intersectoral collaboration can be involved in institutional infrastructures to a greater or lower extent and be based on more or less formal

arrangements. The following options were considered: (i) advisory groups with a clear (presumably greater) mandate involving dedicated departments from relevant administrations; (ii) structures involving the departments and working on an informal basis; (iii) working groups with a clear, although limited, mandate involving representatives of different sectors; and (iv) structures involving representatives of various sectors working on an informal basis. For the health sector, the existence of a dedicated unit in the ministry of health dealing with health integration in other sectors and policies was also considered.

While structures were used in various ways across the Region (Fig. 71), the most common were multisectoral working groups with a clear mandate (60%). Interdepartmental advisory groups were the least common collaborative structure (25%). More than half of the countries reported the existence of a dedicated unit in the ministry of health.

Fig.71. Structures for intersectoral collaboration on environment and health, by country grouping

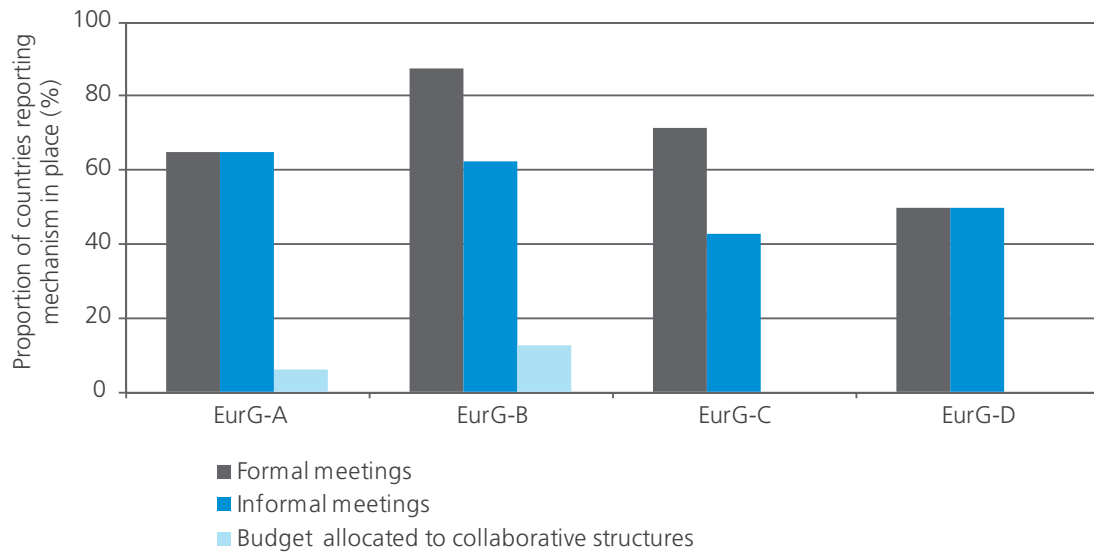


The range of collaborative structures in the EurG-A grouping could be explained by the less centralized national political systems under the EU supranational framework. Furthermore, with the adoption of the polluter pays principle in many European countries, the responsibility for control of pollution levels has shifted away from the health sector to the relevant jurisdictions (for example, transport in the case of air pollution).

Both intersectoral collaborative structures with clear mandates (such as multisectoral working groups) and informal structures are rare in EurG-D countries. Interdepartmental collaboration is common, although it is mainly without a clearly formulated mandate.

Meetings were the main mechanisms for collaboration on environment and health (Fig. 72). Both formal and informal meetings were reported, with formal ones being most common (70%). Only two countries (Denmark and Slovakia) claimed to allocate funds in support of collaborative structures. While all countries show commitment to intersectoral collaboration, sustainable and effective cooperation on environment and health cannot be achieved without adequate financial support.

Fig. 72. Mechanisms of intersectoral collaborative structures by country grouping



Conclusions of the assessment

Analysis of the information accumulated in the ENHIS system and of the responses to the WHO survey on environment and health policies and the WHO CEHAPE survey allows the following conclusions to be drawn about the status of and trends in the situation regarding environment and health and on the main features in relevant policies.

- The improvement in the EH situation over the last two decades can be seen in many relevant issues, including better accessibility to improved water, reduced incidence of injuries, improved air quality and reduced exposure to lead and persistent organic pollutants. In most cases, these improvements are a result of effective action related to improved environmental infrastructure and regulations as well as to safer public behaviour.
- Despite the overall progress, significant disparities in EH risks remain in the Region in relation to all priority issues listed in CEHAPE. These disparities are seen both between and within the countries. Several old issues remain unresolved, posing a significant public health problem in parts of the Region. Examples include:
 - more than 50% of the rural population in 10 countries have no access to improved water;
 - the incidence of unintentional injuries differs by an order of magnitude between countries;
 - mortality from traffic-related injuries in the newly independent states has increased in the last decade, in contrast to the trend in earlier years and to the trends in the rest of the Region;
 - population exposure to inhalable PM, causing a loss of more than one year of life expectancy in the more polluted areas and accounting for more than half million premature deaths in Europe, remains stable after a substantial fall in the 1990s;
 - in many countries over 80% of children are regularly exposed to SHS at home, and more than 20% of households live in houses subject to damp and mould;
 - many countries in the Region continue to use leaded petrol.
- The availability of and accessibility to relevant data and information have increased significantly over the last decade, largely owing to the new requirements for improved monitoring and data exchange between the Member States (either as a consequence of EU legislation or of international conventions) and the activities coordinated by the European Environment Agency and WHO. The establishment of ENHIS provided an important and efficient tool for situation analysis. Nevertheless, data availability is far from complete. The lack of relevant monitoring in large parts of the Region restricts the possibility of making a comprehensive assessment of the situation.
- In the case of several old problems, such as outdoor air pollution, many countries have exhausted the simple measures to control hazardous emissions and need to turn to more complicated, systemic approaches to reduce population exposure levels. Local measures are not sufficient, and regional and international action is needed to achieve further progress in reducing pollution. In the eastern part of the Region, air quality management systems have not been adapted to the changing evidence and knowledge base and to the identification of inhalable particles as a prominent and widespread health risk.

- The scope of public policies varies significantly between environmental health issues. While traditional hazards, such as those related to drinking- and bathing water, attract a broad range of action and include substantial involvement by health systems, policies are more poorly developed for issues related to indoor air quality, the prevention of unintentional injuries or the promotion of physical activity.
- The regulatory basis for action has improved significantly in recent years. International regulations, such as new directives on air quality or on management of chemicals, have been introduced in EU countries and are also followed in many non-EU countries in the Region. In non-EU countries, more than half of the regulatory acts related to environment and health have been developed, revised or updated in the last five years. For example, the UNECE/WHO *Protocol on water and health* supports Region-wide health regulation in the areas of integrated water resource management and a sustainable water supply; the FCTC promotes new action to reduce exposure to SHS; and the Strategic Approach to International Chemicals Management provides a new framework for chemical safety.
- Consideration of population health varies substantially between policies addressing various topics. Health is well considered in policy development in most parts of the Region in relation to drinking-water, outdoor air quality or food safety. Substantial differences between various parts of the Region exist in relation to policies on bathing water. Explicit consideration of health in development of policies is still rare in policies on unintentional injuries, physical activity or heavy metals. In some issues, however, such as unintentional injuries, physical activity and exposure to SHS, countries' health systems are involved in policy implementation even though health is not explicitly considered in formulation of policy.
- The extent and methods of implementation and enforcement of policies related to the quality of drinking- and bathing water, unintentional injuries, physical activity, outdoor air quality, SHS and environmental noise vary substantially between groups of countries. In general, penalties for infringement of regulations are more often used in the east of the Region and action plans to reduce risks are more common in the west.
- There is less accountability for health in policies on dampness and mould, heavy metals and noise than for other topics. It is also low in some groups of countries for unintentional injuries, physical activity, heavy metals and noise. The level of accountability corresponds to the existence and efficiency of health-relevant monitoring systems and use of the available information for policy evaluation. The lack of reliable monitoring systems relevant to widespread environmental health risks, such as outbreaks of water-related diseases or inhalable PM, remains a problem in many countries of the Region.
- There is a high level of involvement of health systems in policy implementation in most countries for drinking-water, SHS and food safety. It varied significantly between the countries for most other topics, to some extent reflecting the different distribution of responsibilities within public agencies. In some cases, however, lower involvement of the health system could be due to its insufficient resources and capacities.
- In most countries, little attention is paid to the special needs of vulnerable groups in relation to all the topics considered except unintentional injuries or physical activity. This may increase social inequalities in exposure and the related health risks.
- Information available to prioritize, monitor and assess the effectiveness of action is unequal across the Region. This hampers the effective use of resources and reduces the sustainability of action. The information available to the public is also limited, lessening their involvement in risk reduction and support for policies addressing the environmental determinants of health. The scarcity of data reduces the possibility of carrying out risk analysis, setting priorities for action and monitoring their implementation. An example is the comparative analysis of public health impacts of various environmental hazards completed by the Environmental Burden of Disease in Europe pilot project involving six countries (see Box 5).

- The availability of skilled human resources supported by a stable institutional base is a key problem limiting the ability to plan and implement action to improve the environmental health situation, especially in the eastern parts of the Region. Inadequate and ineffective intersectoral collaboration further restricts the capacity to address old problems and identify emerging ones. The lack of a sustainable mechanism facilitating this collaboration, in particular the lack of budgets allocated to it or the informal character of the collaboration, makes it and the pooling of resources difficult.

Box 5. Ranking of environmental stressors by health impact in Europe – results of the Environmental Burden of Disease in Europe (EBoDE) project¹

Ambient air pollution and environmental noise are the leading causes of the environmental burden of disease in selected European countries, followed by indoor radon, passive smoking, lead and ozone exposures. These are the preliminary results of the multinational Environmental Burden of Disease in Europe pilot project in six participating countries.²

The calculations were based on the most recent scientific evidence concerning population exposure and health effects. WHO environmental burden of disease methodology was used to quantify DALYs lost due to environmental stressors.³ In the first phase of the project, preliminary calculations were carried out for nine environmental stressors for which, by agreement with the study partners, there is sufficient evidence on the links between exposure and health outcomes (Fig. 73).

Fig. 73. Relative public health impact of selected first priority stressors in six countries

		STRENGTH OF THE EVIDENCE		
		High	Medium	Low
PUBLIC HEALTH IMPACT	High	Particulate air pollution (6000–10 000)		
	Medium	Radon (600–800) Passive smoking (300–600)	Noise (1000–1500) Lead (200–400) Ozone (40–200)	Dioxins (0–400)
	Low	Benzene (2–4)		Formaldehyde (0–2) ^a

^a A numerical model has been used to estimate threshold exceedances.

Notes. Numerical values indicate DALYs per million people averaged over six participating countries. Numerical ranges reflect uncertainty in the average estimate while variability between countries is in many cases much larger.

¹ EBoDE [website]. Opaset (<http://en.opasnet.org/w/EBoDE>), accessed 12 February 2010).

² Participating countries and institutes: Flemish Institute for Technological Research (Belgium), National Institute for Health and Welfare (Finland), Institute for Public Health Surveillance (France), Federal Environment Agency, North Rhine Westphalia Institute of Health and Work Centre for Public Health, and University of Bielefeld (Germany), University of Milan and National Institute of Health (Italy), National Institute for Public Health and the Environment (Netherlands).

³ Quantifying environmental health impacts [web site]. Geneva, World Health Organization, 2010(http://www.who.int/quantifying_ehimpacts/en/), accessed 12 February 2010).

Annex 1

Countries which responded to WHO's survey on environment and health policies (June 2009) and survey on CEHAPE (November 2009)

List of policy topics

Intersectoral collaboration

1.1. Drinking-water quality

1.2. Sanitation and sewage

1.3. Bathing water quality

1.3.1. Coastal and freshwater quality

1.3.2. Swimming pool water quality

2.1. Road transport injuries

2.2. Unintentional injuries excluding road traffic

2.3. Physical activity

3.1. Outdoor air quality

3.2. Dampness and mould in indoor air

3.3. Second-hand tobacco smoke (SHS)

4.1. Noise

4.2. Food safety

4.3. Chemical safety – pesticides

4.4. Chemical safety – heavy metals

Country		WHO POLICY SURVEY																	CEHAPE Survey
		Intersectoral Collaboration	RPG I – Water & Sanitation				RPG II Injuries			RPG III Air Quality			RPG IV Chemicals & Noise				Optional		
			1.1	1.2	1.3.1	1.3.2	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	4.4	UV	Radon	
1	Albania																		X
2	Andorra	X	X	X		X	X	X	X		X	X	X						X
3	Armenia											X							X
4	Austria	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Azerbaijan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X
6	Belarus	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X ^a
7	Belgium	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
8	Bosnia and Herzegovina	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	Bulgaria	X	X		X	X		X	X	X	X	X	X	X					X
10	Croatia	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X
11	Cyprus																		X
12	Czech Republic																		X
13	Denmark	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	Estonia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	Finland	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16	France																		X
17	Georgia																		X ^a
18	Germany	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19	Greece	X	X	X	X														X
20	Hungary	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	Iceland																		
22	Ireland	X	X	X	X			X		X	X	X	X	X	X		X	X	X
23	Israel	X	X	X	X			X	X	X	X	X	X	X	X		X		X
24	Italy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25	Kazakhstan																		
26	Kyrgyzstan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	Latvia	X	X	X	X	X	X	X	X		X	X	X						X
28	Lithuania	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29	Luxembourg	X	X	X	X	X			X	X	X	X	X	X		X	X		X
30	Malta							X											X
31	Monaco																		
32	Montenegro																		X ^a
33	Netherlands	X	X		X	X		X	X	X	X	X					X		X
34	Norway	X	X		X			X	X	X	X	X	X	X	X				X
35	Poland	X	X	X	X			X	X	X	X	X	X	X	X		X		X
36	Portugal	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Country	WHO POLICY SURVEY																	CEHAPE Survey	
	Intersectoral Collaboration	RPG I – Water & Sanitation				RPG II Injuries			RPG III Air Quality			RPG IV Chemicals & Noise				Optional			
		1.1	1.2	1.3.1	1.3.2	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	4.4	UV	Radon		
37	Republic of Moldova	X							X		X			X	X			X	
38	Romania	X			X		X	X			X	X		X					
39	Russian Federation	X	X	X	X				X	X		X	X	X	X	X	X		
40	San Marino																		
41	Serbia	X	X	X	X	X	X		X		X	X	X		X		X	X	
42	Slovakia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
43	Slovenia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
44	Spain	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
45	Sweden	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X ^a	
46	Switzerland	X	X	X		X	X	X	X	X	X	X		X			X	X	
47	Tajikistan	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	
48	The former Yugoslav Republic of Macedonia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
49	Turkey	X	X	X	X			X	X			X			X		X	X	
50	Turkmenistan																	X	
51	Ukraine																		
52	United Kingdom	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
53	Uzbekistan																	X	
Number of answers		38	36	32	35	32	31	29	31	36	31	36	35	31	32	29	22	28	46

^a Countries which responded to the CEHAPE survey after the deadline. These data were not, therefore, included in the analysis.

Annex 2

List of ENHIS fact sheets²

1.1	Outbreaks of waterborne diseases
1.2	Public water supply and access to improved water sources
1.3	Wastewater treatment and access to improved sanitation
1.4	Bathing water quality
2.1	Mortality from road traffic injuries in children and young people
2.2	Mortality in children and adolescents from unintentional injuries (falls, drowning, fires and poisoning)
2.3	Prevalence of excess body weight and obesity in children and adolescents
2.4	Percentage of physically active children and adolescents
3.1	Prevalence of asthma and allergies in children
3.2	Infant mortality from respiratory diseases
3.3	Exposure of children to outdoor air pollution (particulate matter)
3.4	Exposure of children to second-hand tobacco smoke
3.5	Children living in homes with problems of dampness
3.6	Proportion of children living in homes using solid fuel
3.7	Policies to reduce the exposure of children to second-hand tobacco smoke
4.1	Incidence of childhood leukaemia
4.2	Incidence of melanoma in people aged under 55 years
4.3	Persistent organic pollutants (POP) in human milk
4.4	Exposure of children to chemical hazards in food
4.5	Levels of lead in children's blood
4.6	Radon levels in dwellings
4.7	Work injuries in children and young people

² Environment and health information system [web site]. Copenhagen, WHO Regional Office for Europe, 2010 (www.euro.who.int/enhis).

Annex 3

Policy survey and policy analysis methods

Data collection

Information concerning the policy framework and measures in each Member State was collected through a survey instrument. The questionnaire was in 16 parts, each focusing on separate EH topics across the four regional priority goals. Each part consisted of 13 questions designed to collect information about national policies addressing policy framework, type of policy, scope, objectives, policy targets, equity considerations, implementation, enforcement, monitoring and evaluation of policy, health sector involvement and the provision of information to the public. The general part of the questionnaire collected information about collaborative structures supporting health policy integration.

The questionnaire (in English or Russian) was distributed to all 53 Member States in the Region, of which 40 replied. Once all questionnaires had been received, some initial results were put together and presented at a meeting of all participating countries (in Bonn on 22 and 23 June 2009). During the meeting, some concerns were raised about the ambiguity of some questions. These concerns were addressed and once all participants had a clear understanding of all questions, time was given for countries to make appropriate revisions to their replies.

At the same meeting, participants discussed and adopted the model for the policy analysis, which incorporated answering options from the policy questionnaire.

Data analysis

The analysis used for this policy assessment is rooted theoretically in three constructs: public governance, healthy public policy, and transparency and communication. All constructs were developed in order to retrieve valuable information about policy development while emphasizing the importance of health in policy and the health impacts related to policy. From these constructs, six dimensions were created to highlight key policy aspects. For each dimension, answering options from the questionnaire were selected and used as indicators to measure a country's strength within a given dimension.

Public governance

The construct of public governance focused mainly on the development, implementation and enforcement of public policy and compliance with it (Fig. A1). The following is a brief explanation of the dimensions within this construct.

Dimension 1: Policy development

The purpose of this dimension is to explore which types of policy have been implemented and at which political level policy regulation is governed. Country replies allowed for an assessment of policy development in order to determine which policies had been implemented in a systematic and consistent manner.

Dimension 2: Implementation and enforcement

This dimension was established to investigate methods set in place to monitor compliance with policy. It assesses what techniques are used such as standardized criteria for monitoring, regular reporting and the designation of a competent authority to control compliance. Action taken in the event of non-compliance is also relevant to this dimension.

Healthy public policy

Healthy public policy is a rather novel concept which has yet to be clearly defined. Its purpose is to increase the involvement of the health sector throughout policy development and across all sectors of government. Furthermore, healthy public policy aims to make policy more accountable for its health impacts in relation to the whole population and in particular to vulnerable population groups, such as children. The aspects included in the concept are presented in Fig. A2.

Dimension 3: Accountability for health

This is a broad dimension which focuses on policy-makers' ability to incorporate health accountability into policy development. It investigates the use of evidence and information about health risks in the setting of policy targets and in monitoring progress towards those targets. Monitoring and surveillance measures must be based on health-relevant indicators (such as a valid population exposure) in order to be accountable for health. This dimension also considers action and measures for making policy accountable for its health impact, as well as information provided to the public about the current situation of health risks or possible health benefits.

Dimension 4: Involvement of the health sector

The aim of this dimension is to investigate the involvement of the health sector at each stage of policy development. Assessment is based primarily on mechanisms in place to ensure such involvement throughout policy formulation, implementation, evaluation and the preparation of information concerning related health risks. Control and enforcement are also taken into account, but with less direct relation to the health sector.

Dimension 5: Equity considerations

The rationale for this dimension is to determine which population groups are taken into account during policy development. Consideration of various population sub-groups and action taken to protect such groups are measured and assessed. The primary focus in this analysis is on children although other relevant groups are also taken into account.

Transparency and communication

Dimension 6: Information to the public

The answering options selected to evaluate strength in this dimension (Fig. A3) are indicators of how easily the public has access to important policy information. This dimension also assesses information given to the public with the purpose of promoting health, educating them about the benefits of given interventions and raising awareness of relevant health risks and policy action plans. It is important to note that information which is publicly available should also be provided in a manner which is comprehensible to everyone.

Calculation of scores

Once the dimensional model had been developed and approved by all participants, country scores were calculated (Tables A1, A2). For each answering option, countries were awarded 1 point if they answered "yes" or 0 points if they answered "no". All points were then added up for each dimension, divided by the maximum possible score in each dimension and multiplied by 100. Using scores out of 100 gave consistency to all dimensions and allowed scores for all dimensions to be displayed using radar plots (Figs A4, A5). Country scores were then aggregated in country group scores, which were the averages of scores for all countries in a given group.

Fig. A1. Aspects covered by the dimensions of public governance

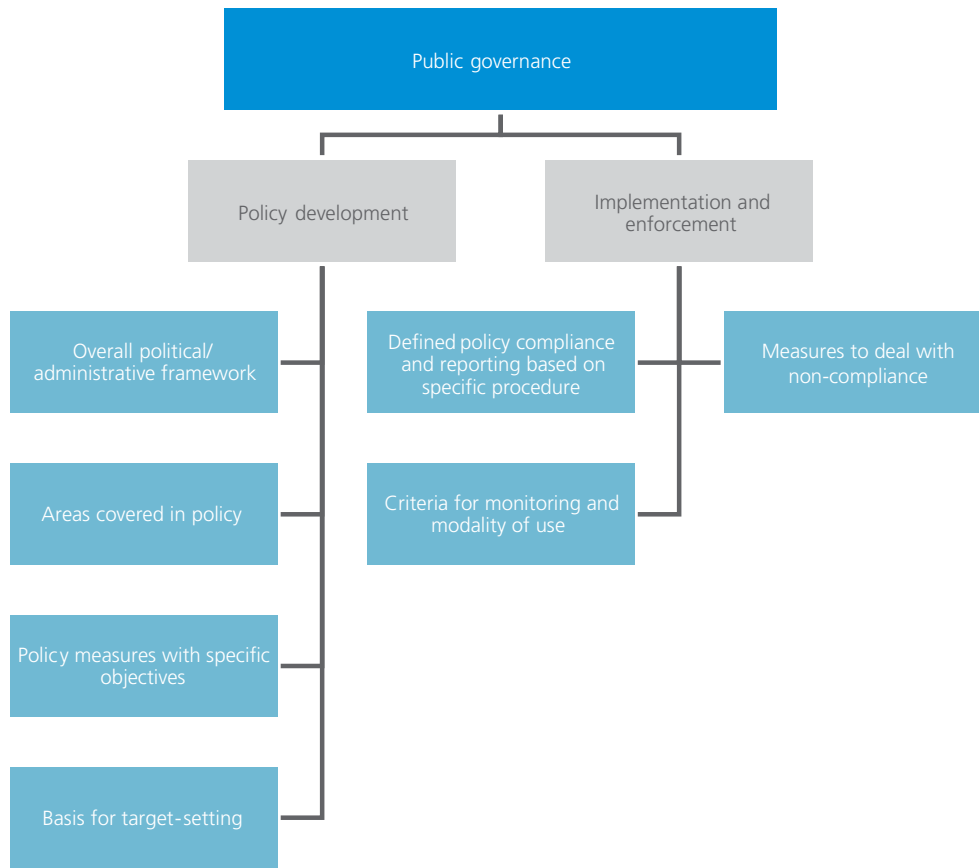


Fig. A2. Policy aspects covered by the dimensions in healthy public policy

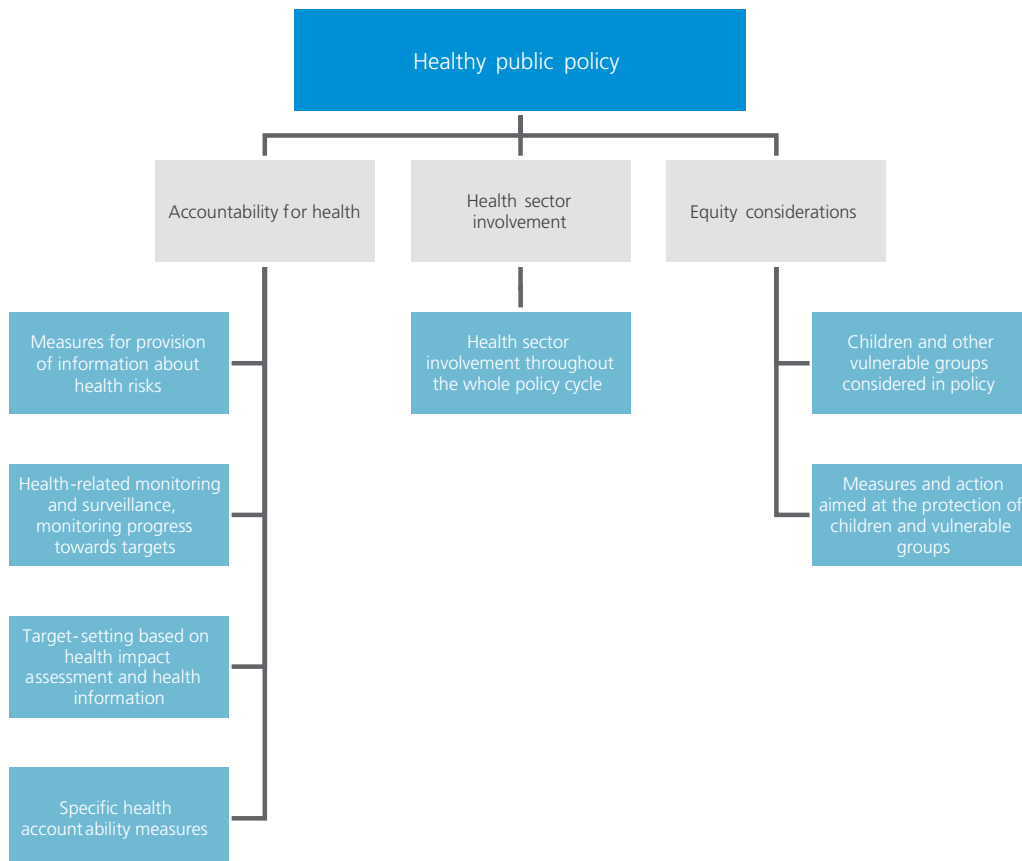
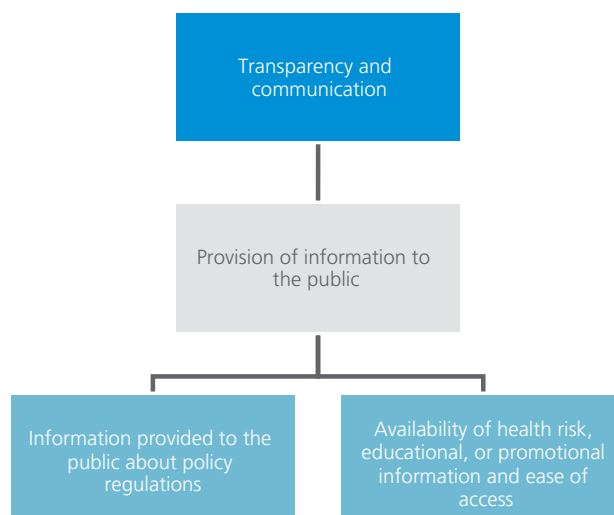


Fig. A3. Policy aspects covered by the dimensions in transparency and communication



In a few cases, scores other than 0 or 1 were given. Answering options which displayed a lack of crucial measures were given -1 point. For example, countries which reported no measures in place to ensure compliance for road traffic injuries lost 1 point from the overall score of implementation and compliance. On the other hand, answering options which represented strong policy measures were given 2 points. For example, countries which reported having policies for bathing water quality which followed EU legislation or were covered by national statutory policies were awarded 2 points. Lastly, to avoid double-counting, some scores were merged. For example, countries which reported policy objectives and/or targets based on international commitments were only awarded 1 point, regardless of whether they had answered yes to one or both options.

Table A1. Example of answering options used in scoring drinking-water quality

Drinking-water quality	Ideal score	Country X
Policy developments		
National/federal policy in place		
Mostly following EU legislation	1	1
Covered by national statutory policies	1	1
Covered in non-statutory initiatives	1	0
Policy objectives		
<i>Compliance with drinking-water quality standards/regulations for:</i>		
microbiological and chemical indicator parameters	1	1
continuity of supply	1	1
control/reduction/abatement of pollutants at the water supply source	1	1
building infrastructure and management of drinking-water supply	1	1
health risk reduction/prevention	1	0
preparedness and response to emergencies ensuring health protection	1	1
Basis for target-setting		
International/EU commitments	1	1
National: sectoral policy strategy, experience gained in the country	1	1

Total	11	9
Score ((XX/11)*100)	100.0	81.8
European Region average	74.2	

Implementation and enforcement

Policy compliance defined and reported

Legally binding according to pre-defined criteria	1	1
Mandatory reporting on pollution level according to pre-defined format	1	0
Existence of a designated competent authority	1	1

Measures in case of non-compliance

Prohibition or restricted use of contaminated water supply dangerous to health	1	0
Penalties for infringements of the legal provisions to ensure their implementation	1	1
Appropriate remedial measures to minimize the risk of non-compliance and restore the water quality with priority given to rectifying problems at the source	1	1
Specific action aimed at the protection of the population at risk	1	1

Methods/criteria for monitoring

As in EC legislation, international standards, guidelines	1	0
As prescribed in national standards, guidelines	1	1

Total	9	6
Score ((XX/9)*100)	100.0	66.7
European Region average	70.0	

Accountability for health

Basis for target-setting

Information on health risks related to pollution of drinking-water	1	1
Health impact assessment	1	0

Monitoring progress towards policy targets

Monitoring network for drinking-water quality, including data collection	1	0
Periodic reports available and used to review policy obligations and targets	1	0
Specific indicators coupled with targets to measure progress towards the attainment of policy objectives	1	0
Introducing water safety plans that monitor water quality throughout the chain from source to consumption	1	0

Measures in place to ensure health accountability

Permanent health surveillance, e.g. outbreaks and diseases related to drinking-water	1	1
Mandatory periodic evaluation and follow-up on the health consequences	1	0
Health impact assessment to define policy effectiveness	1	0

Total	9	2
Score ((XX/9)*100)	100.0	22.2
European Region average	54.8	

Health sector involvement

Mechanisms to ensure health sector involvement throughout policy cycle

Policy formulation – defining the health impact	1	0
Policy implementation – relevant monitoring/surveillance	1	0
Policy evaluation – assessment and reporting back	1	0
Control and policy enforcement	1	1
Dissemination of information on health risks of drinking-water pollution	1	1
Total	5	2
Score ((XX/5)*100)	100.0	40.0
European Region average	84.1	

Equity considerations

Population groups considered in policy

Potentially highly affected	1	0
Groups at high risk from small water supplies	1	0
Children	1	0
Deprived population subgroups	1	0
Total	4	0
Score ((XX/4)*100)	100.0	0.0
European Region average	30.9	

Transparency and communication

Information provided to the public

Current quality information on drinking-water readily available through easily accessible media	1	1
Information on action programmes and water safety plans	1	0
Regular public reports on drinking-water quality	1	0
Reports describing health impact of pollution in drinking-water	1	0
Promotion of action and sustainable use of water supply zones	1	0
Total	5	1
Score ((XX/5)*100)	100.0	20.0
European Region average	62.3	

Fig. A4. Radar plot displaying scores calculated for country X and the European Region average for drinking-water quality

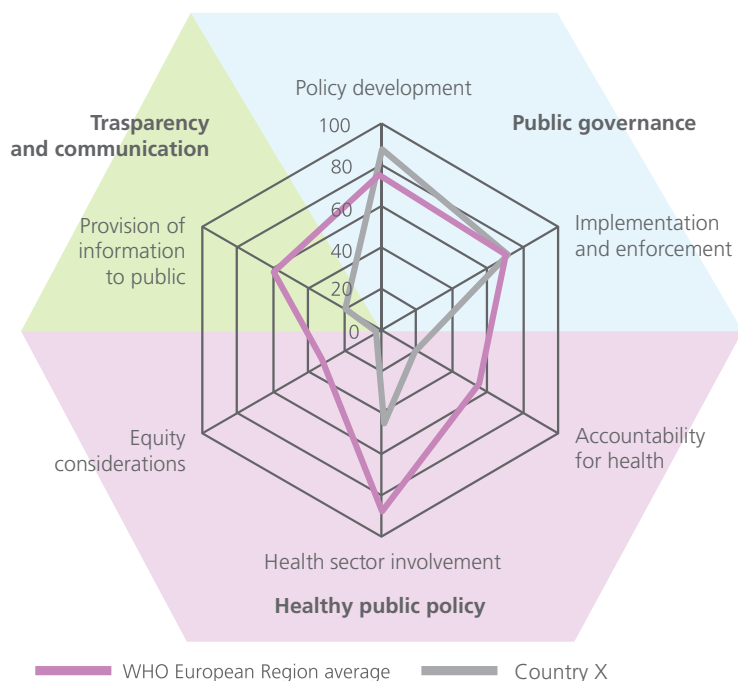


Table A2. Example of answering options used in calculating scores for second-hand tobacco smoke

Second-hand tobacco smoke	Ideal score	Country X
Policy development		
National/federal policy in place		
Covered by national statutory policies	1	1
Covered in non-statutory initiatives	1	0
Policy objectives		
<i>Specified population subgroups</i>		
Whole population	1	1
<i>Creation of smoke-free environments:</i>		
at homes	1	0
private cars	1	0
<i>Smoking ban in public places:</i>		
bars and restaurants	1	1
hospitals	1	1
education facilities	1	1
offices	1	1
shops	1	1
arenas for sport or leisure activities	1	1
public transport and terminals	1	1
Reduction of (active) smoking prevalence	1	1

Basis for target-setting		
International/EU guidelines	1	1
National/sectoral policy strategy, experience gained in the country	1	0
Total	15	11
Score ((XX/15)*100)	100.0	73.3
European Region average	66.5	

Implementation and enforcement

Policy compliance defined and reported		
Legally binding according to pre-defined conditions	1	0
Mandatory reporting according to pre-defined format	1	1
Existence of a designated competent authority	1	1
Measures in case of non-compliance		
Penalties for infringements of the legal provisions to ensure their implementation	1	1
Prohibition or restricted use to eliminate the risk of non-compliance	1	0

Methods/criteria for monitoring

As in EC legislation, international standards guidelines	1	0
As prescribed in national standards, guidelines	1	0
Total	7	3
Score ((XX/7)*100)	100.0	42.9
European Region average	47.8	

Accountability for health

Basis for target-setting		
Health impact assessment	1	1
Scientific development in the field of health risks to second-hand tobacco smoke (ETS)	1	1
Monitoring progress towards policy targets		
Systematic monitoring of actual smoke-free environments	1	0
Periodic reports available and used to review policy obligations and targets	1	1
Specific indicators coupled with targets to measure progress towards the attainment of policy objectives	1	0
Measures in place to ensure health accountability		
Permanent health surveillance	1	0
Mandatory periodic evaluation and follow-up on health consequences	1	0
Health impact assessment to monitor policy effectiveness	1	0
Total	7	2
Score ((XX/7)*100)	100.0	28.6
European Region average	42.3	

Health sector involvement

Mechanisms to ensure health sector involvement throughout policy cycle

Policy formulation - defining the health impact	1	1
Policy implementation - relevant monitoring/surveillance	1	1
Policy evaluation - assessment and reporting back	1	1
Control and enforcement of policy	1	1
Dissemination of information on health risks of second-hand tobacco smoke	1	1
Total	5	5
Score ((XX/5)*100)	100.0	100.0
European Region average	79.1	

Equity considerations

Population groups considered in policy

Specified population subgroups

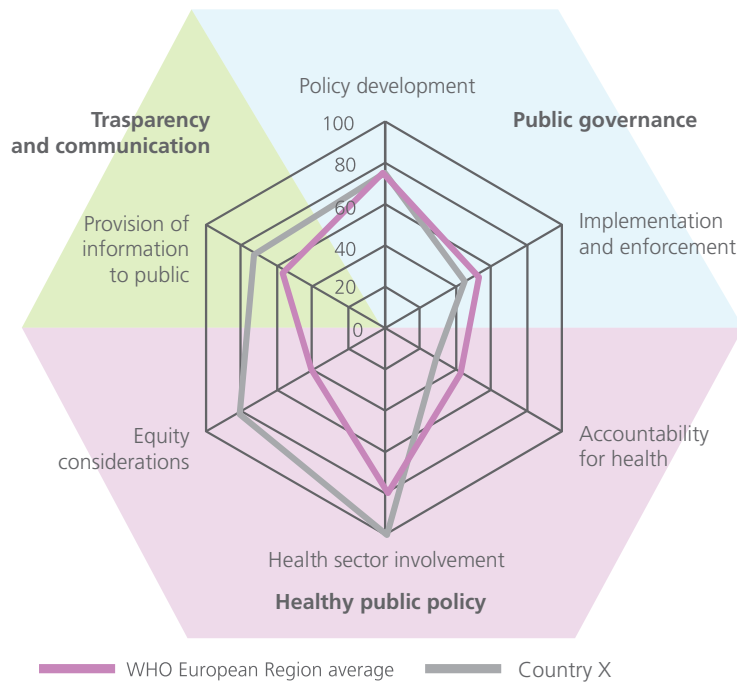
High-exposure groups	1	1
Children	1	1
Pregnant women	1	1
Deprived population subgroups	1	1
Workers	1	0
Total	5	4
Score ((XX/5)*100)	100.0	80.0
European Region average	39.7	

Transparency and communication

Information provided to the public

Information on extent of second-hand tobacco smoke readily available through any easily accessible media	1	1
Regular public reports on smoke-free environments	1	0
Promotion of action to achieve 100% smoke-free environments	1	1
Reports describing health risks of second-hand tobacco smoke	1	1
Total	4	3
Score ((XX/4)*100)	100.0	75.0
European Region average	55.9	

Fig. A5. Radar plot displaying scores calculated for country X and the European Region average for second-hand tobacco smoke



Annex 4

Contributors

The following experts provided information and data used in the report and participated in its preparation and review.

ALBANIA

Marita Afezulli
Ministry of Health

Shkelqim Mema
Ministry of Environment

ANDORRA

Moisès Tomàs Rubio
Ministry of Health, Welfare, Family and Housing

Rosa Vidal
Ministry of Health, Welfare, Family and Housing

David Palmitjavila
National Transport Agency

Gemma Marsal Llanes
Ministry of Health, Welfare, Family and Housing

Marc Rossell
Department of Environment

Gemma Marsal Llanes
Ministry of Health, Welfare, Family and Housing

Jesús Galindo
Food and Environment Security

Josep Casals Alís
Ministry of Health, Welfare, Family and Housing

ARMENIA

Anahit Aleksandryan
Ministry of Nature Protection

Nune Bakunts
Ministry of Health

AUSTRIA

Susanne Brandstetter
Federal Ministry of Agriculture, Forestry,
Environment and Water Management

Eva-Maria Eichinger-Vill
Federal Ministry for Transport, Innovation and
Technology

Ilan Fellmann
Federal Ministry for Women and Civil Service

Helfried Gartner
Federal Ministry of Agriculture, Forestry,
Environment and Water Management

Astrid Heber
Federal Ministry of Health

Philipp Hohenblum
Federal Environment Agency

Thomas Jakl
Federal Ministry of Agriculture, Forestry,
Environment and Water Management

Viktor Karg
Federal Ministry of Agriculture, Forestry,
Environment and Water Management

Peter Kranner
Federal Ministry of Health

Martin Kriech
Federal Ministry of Agriculture, Forestry,
Environment and Water Management

Stefan Napetschnig
Federal Ministry of Health

Martin Renhardt
Federal Ministry of Health

Alice Schogger
Federal Ministry of Health

Robert Thaler
Federal Ministry of Agriculture, Forestry,
Environment and Water Management

Fritz Wagner
Federal Ministry of Health

Charlotte Wirl
Gesundheit Österreich GmbH

Josef Zechner
Federal Ministry of Health

AZERBAIJAN

Imran Abdulov
Ministry of Ecology and Natural Resources

Mirza Kazimov
Ministry of Health

BELARUS

Juriy E. Fedorov
Ministry of Health

Irina Zastenskaya
Republican Scientific Practical Centre of Hygiene

BELGIUM

Pierre Biot
FPS Health, Food Chain Safety and Environment
DG Environment

Ethel Brits
Scientific Institute of Public Health

Yseult Navez
Federal Public Service Health

An Van Nieuwenhuysse
Scientific Institute of Public Health

Bart Verhagen
Federal Coordination Environment & Health
Services of the President

BOSNIA AND HERZEGOVINA

Nihada Ahmetovic
Food Safety Authority

Dusanka Danojevic
Public Health Institute of the Republika Srpska

Amela Lolic
Ministry of Health and Social Welfare of the
Republika Srpska

Mirha Ošijan
Ministry of Civil Affairs

Slavenko Sehovic
Federal Ministry of Health and Social Affairs,
Federation of Bosnia and Herzegovina

Aida Vilic-Svraka
Federal Public Health Institute

Dražan Tomic
Department of Health and other Services
Government of Brcko District

BULGARIA

Mariana Barouh
Ministry of Environment and Water

Plamen Dimitrov
National Centre for Public Health Protection

Hristina Mileva
Ministry of Health

CROATIA

Krunoslav Capak
Croatian National Institute of Public Health

Vlasta Hrabak-Žerjavic
Croatian National Institute of Public Health

Dubravka Kipic
Croatian National Institute of Public Health

Verica Kralj
Croatian National Institute of Public Health

Marina Kuzman
Croatian National Institute of Public Health
Zagreb, Croatia

Goranka Petrovic
Croatian National Institute of Public Health

Vedran Poljak
Croatian National Institute of Public Health

Jadranka Pongracic
Croatian National Institute of Public Health

Nina Zovko
Croatian Environment Agency

CYPRUS

Adamos Hadjipanayis
Larnaca General Hospital

Stella Michaelidou
National Committee on Children's Health and
Environment

CZECH REPUBLIC

Andrea Batariova
National Institute of Public Health

Pavlna Janová
Ministry of Health

Frantisek Kozisek
National Institute of Public Health

Ruzena Kubinova
National Institute of Public Health

Vladimíra Puklová
National Institute of Public Health

DENMARK

Linda Bagge
Danish Environmental Protection Agency

Dorte Bjerregaard Lerche
Danish Environmental Protection Agency

Shima Dobel
Danish Environmental Protection Agency

Henrik Hansen
National Board of Health

Dorte Harning
Danish Working Environment Authority

Jørgen Jakobsen
Danish Environmental Protection Agency

Christoffer Johansen
Danish Cancer Society

Mogens B. Kaasgaard
Agency for Spatial and Environmental Planning

Lis Keiding
National Board of Health

Jytte Kjærgaard
Danish Veterinary and Food Administration

Brian Kristensen
Danish Environmental Protection Agency

Tue Kristensen
National Board of Health

Mona Mejsen Westergaard
Ministry of Environment

Marianne Moth
Agency for Spatial and Environmental Planning

Niels Ole Olesen
Danish Working Environment Authority

Henning Sandau
National Board of Health

Niss Skov Nielsen
National Board of Health

Nina Sørup Hansen
Danish Environmental Protection Agency

Lea Thume
Ministry of Traffic

Ulrik Torp
Danish Environmental Protection Agency

Ersün Züfer
Danish Enterprise and Construction Authority

ESTONIA

Leena Albreht
Health Protection Inspectorate

Aune Annus
Health Protection Inspectorate

Küllike Birk
Health Protection Inspectorate

Toomas Ernits
Estonian Road Administration

Viktor Grigorjev
Ministry of Environment

Tarvo Järve
Ministry of Agriculture

Haidi Kanamäe
Ministry of Agriculture

Marika Karro
Health Protection Inspectorate

Margus Korsjukov
Ministry of Environment

Heli Laarmann
Ministry of Social Affairs

Margus Mihkelsoo
Health Protection Inspectorate

Tiina Paldra
Ministry of Social Affairs

Evelyn Pesur
Ministry of Environment

Natali Promet
Health Protection Inspectorate

Reet Pruul
Ministry of Environment

Alla Romanova
Ministry of Environment

Juri Ruut
Health Protection Inspectorate

Iisi Saame
Ministry of Social Affairs

Koidula Saun
Ministry of Social Affairs

Raimond Strastin
Veterinary and Food Board

Aive Telling
Ministry of Social Affairs

FINLAND

Hannu Arvela
Radiation and Nuclear Safety Authority

Otto Hanninen
National Institute for Health and Welfare

Sebastian Hielm
Ministry of Agriculture and Forestry

Matti Jantunen
National Institute for Health and Welfare

Kari Jokela
Radiation and Nuclear Safety Authority

Jari Keinänen
Ministry of Social Affairs and Health

Hannu Komulainen
National Institute for Health and Welfare

Jaana Markkula
National Institute for Health and Welfare

Ilkka Miettinen
National Institute for Health and Welfare

Mari Miettinen
Ministry of Social Affairs and Health

Aino Nevalainen
National Institute for Health and Welfare

Mikko Paunio
Ministry of Social Affairs and Health

Juha Pekkanen
National Institute for Health and Welfare

Jyrki Pitkäkärvi
Ministry of the Environment

Anni Rimpiläinen
Ministry of Transport and Communication

Raimo O. Salonen
National Institute for Health and Welfare

Juha Vlatonen
Ministry of Transport and Communication

Juoko Tuomisto
National Institute for Health and Welfare

Outi Zaccheus
National Institute for Health and Welfare

FRANCE

Vincent Delporte
Ministry of Sustainable Development

Salma Elreedy
French Agency for Environmental and
Occupational Health and Safety

Caroline Paul
Ministry of Health

Philippe Pirard
French Institute for Public Health Surveillance
(INVS)

GEORGIA

Nikoloz Pruidze
Ministry of Labour, Health and Social Affairs

GERMANY

André Conrad
Federal Environment Agency

Dagmar Kallweit
Federal Environment Agency

Odile Mekel
Institute of Public Health Nordrhein-Westfalen
(LÖGD)

Miguel Morales Harris
Erfstadt

Marianne Rappolder
Federal Environment Agency

Clemens Schreiner
Federal Ministry of Health

Imke Thieme
Federal Ministry of Health

Ute Winkler
Federal Ministry of Health

Hajo Zeeb
Institute for Medical Biostatistics, Epidemiology
and Informatics (IMBEI)

GREECE

Olga Cavoura
National School of Public Health (NSPH)

Vassiliki Karaouli
Ministry of Health and Social Solidarity

Alexandra Katsiri
National School of Public Health (NSPH)

Athena Mourmouris
Ministry of the Environment,
Energy and Climate Change

HUNGARY

József Bakos
National Research Institute for Radiobiology and
Radiohygiene

Imre Bordás
National Institute for Environmental Health

Péter Brunner
National Centre for Healthcare Audit and
Inspection

Eva Csobod
Regional Environmental Center for Central and
Eastern Europe

Bálint Dobi
Ministry of Environment and Water

Gyula Dura
National Institute for Environmental Health

Éva Gyulai
National Institute for Environmental Health

Mihály Kádár
National Institute for Environmental Health

András Kiss
Ministry of Environment and Water

Gábor Kocsy
National Research Institute for Radiobiology and Radiohygiene

Béla Maczák
Hungarian Food Safety Office

Tibor Malnasi
National Institute for Environmental Health

Anna Páldy
National Institute for Environmental Health

Gabriella Páll
National Institute of Child Health

Ágnes Pálovics
Directorate of Plant Protection, Soil Conservation and Agri-environment

Péter Rudnai
National Institute for Environmental Health

Éva Vaskövi
National Institute for Environmental Health

IRELAND

Siobhan McEvoy
Department of Health and Children

Michael Murray
Department of Health and Children

ISRAEL

Rina Ashkenazy
Ministry of Agriculture and Rural Development of Israel

Michal Bar-tov
Israel Ministry of Environmental Protection

Tamar Berman
Israel Ministry of Environmental Protection

Stelian Gelberg
Israel Ministry of Environmental Protection

Shalom Goldberger
Israeli Ministry of Health

Eli Gordon
Israeli Ministry of Health

Itamar Grotto
Israeli Ministry of Health

Levana Kordova
Israel Ministry of Environmental Protection

Orna Matzner
Israel Ministry of Environmental Protection

Avi Moshel
Israel Ministry of Environmental Protection

Pola Orenshtain
Israel Ministry of Environmental Protection

Aviva Trehtman
Israel Ministry of Environmental Protection

Ruth Weinstein
Israeli Ministry of Health

ITALY

Mariano Alessi
Ministry of Health

Giulia Arduino
Ministry of Health

Monica Francesca Blasi
Italian National Institute of Health

Alessandra Burali
Ministry of the Environment, Land and Sea

Pasquale Cavallaro
Ministry of Health

Rossella Colagrossi
Ministry of Health

Pier Giuseppe Facelli

Ministry of Health

Giuliana Gasparrini

Ministry of the Environment, Land and Sea

Liana Gramaccioni

Ministry of Health

Emilia Guastadisegni

Ministry of the Environment, Land and Sea

Ivano Iavarone

Italian National Institute of Health

Maria Giuseppina Lecce

Ministry of Health

Tommasina Mancuso

Ministry of Health

Annamaria De Martino

Ministry of Health

Maria Teresa Menzano

Ministry of Health

Fabrizio Oleari

Ministry of Labour, Health and Social Affairs

Daniela Pasella

Ministry of the Environment, Land and Sea

Pietro Pistolese

Ministry of Health

Paolo Rossi

Ministry of Health

Lorenzo Spizzichino

Ministry of Health

Luciana Sinisi

Environmental Protection and Research

Carlo Zaghi

Ministry of the Environment, Land and Sea

KYRGYZSTAN

Sabirjan Abdikarimov

Ministry of Health

Omor T. Kasymov

Ministry of Health

LATVIA

Jana Feldmane

Ministry of Health

Aldis Iama

Road Safety Directorate

Normunds Kadikis

Public Health Agency

Inga Liepina

Ministry of Health

Solvita Muceniece

Public Health Agency

Ilze Strame

Ministry of Health

Arlita Sedmale

Ministry of Agriculture

Maija Sņepste

Public Health Agency

Sanda Terele

Ministry of Health

LITHUANIA

Albertas Barzda

State Environmental Health Centre

Tatjana Bulavskaja

Ministry of Environment

Regina Burbienė

State Environmental Health Centre

Viktorija Buzyte

State Environmental Health Centre

Veslava Golnis

State Public Health Service

Danguolė Gorobeciene

State Environmental Health Centre

Jonas Grigaliūnas

State Plant Protection Service

Daiva Keršulyte

State Environmental Health Centre

Gelena Kriveliene
Ministry of Health

Vytautas Krušinskas
Ministry of Environment

Rima Ladygiene
Radiation Protection Centre

Aida Laukaitiene
State Environmental Health Centre

Erikas Maciunas
Ministry of Health

Saulius Majus
State Environmental Health Centre

Ramune Meižiene
Ministry of Health

Vladimiras Mikerovas
State Environmental Health Centre

Valerija Morkuniene
State Environmental Health Centre

Giedre Namajunaite
State Environmental Health Centre
Gražvyde Norkiene
Institute of Hygiene

Snieguole Šceponaviciene
State Food and Veterinary Service

Natalja Šliachtic
State Environmental Health Centre

Marius Urbonas
State Environmental Health Centre

Valdas Uscila
State Environmental Health Centre

Galina Zagrebneviene
Communicable Diseases Control
and Prevention Centre

Remigijus Zumeras
State Environmental Health Centre

Ingrida Zurlyté
State Environmental Health Centre

LUXEMBOURG
Ralph Baden
Ministry of Health

Philippe Colbach
Water Management Administration

Silke Christmann
Ministry of Health

Nico Harpes
Ministry of Health

Patrick Hau
Ministry of Health

Guy Heintz
Ministry of Transport

Marielle Lecomte
Ministry of Health

Jean-Paul Lickes
Water Management Administration

Carlo Steffes
Ministry of Health

Simone Steil
Ministry of Health

Nora Welschbillig
Water Management Administration

Frank Wersandt
Water Management Administration

Laurence Zeghers
Ministry of Health

Jeff Zigrand
Ministry of Health

MALTA
Marguerite Camilleri
Malta Environment and Planning Authority

Karen Vincenti
Ministry for Social Policy

MONTENEGRO
Mirjana Djuranovic
Ministry of Health

Marina Miskovic
Ministry of Spatial Planning and Environmental Protection

NETHERLANDS

Nel Aland
Ministry of Transport, Public Works and Water Management

Martin van den Berg ^{a), b)}
Ministry of Housing, Spatial Planning and the Environment

Corine van den Bogaard
Ministry of Housing, Spatial Planning and the Environment

Sylvia Gorter
Nijmegen

Maarten Koornneef
Ministry of Health, Welfare and Sport

Ellen Koudijs
National Institute for Public Health and the Environment (RIVM)

Eva-Maria Kunseler
Netherlands Environmental Assessment Agency (PBL)

Klaas Krijgsheld
Ministry of Housing, Spatial Planning and the Environment

Therese Noorlander
Ministry of Health, Welfare and Sport

Brigit Staatsen
National Institute of Public Health and the Environment (RIVM)

Wim Swart
National Institute for Public Health and the Environment (RIVM)

Ans Versteegh
National Institute for Public Health and the Environment (RIVM)

NORWAY

Olov Belander
Norwegian Directorate of Health

Hildegunn Blindheim Jablonska
Climate and Pollution Agency

Randi Edvardsen
Norwegian Food Safety Authority

Truls Krogh
Norwegian Institute of Public Health

Finn Martinsen
Norwegian Directorate of Health

Bente Moe
Norwegian Directorate of Health

Hilde Moe
Ministry of the Environment

Vigdis Rønning
Ministry of Health and Care Services

Øystein Solevåg ^(a)
Bergfald & Col

Atle Wold
Norwegian Food Safety Authority

POLAND

Jadwiga Charzewska
National Food and Nutrition Institute

Wojciech Hanke
Nofer Institute of Occupational Medicine

Marek Jakubowski
Nofer Institute of Occupational Medicine

Jerzy Jankowski
Nofer Institute of Occupational Medicine

Joanna Jurewicz
Nofer Institute of Occupational Medicine

Marta Malinowska-Cieslik
Institute of Public Health, Jagiellonian. University

Kinga Polanska
Nofer Institute of Occupational Medicine

Krzysztof Skotak
National Institute of Public Health

Mariola Sliwinska-Kowalska
Nofer Institute of Occupational Medicine

Janusz Swiatczak
National Institute of Public Health

Irena Szadkowska-Stanczyk
Nofer Institute of Occupational Medicine

Stanislaw Tarkowski
Nofer Institute of Occupational Medicine

PORTUGAL

João Breda
General Directorate of Health (DGDS)

Maria Antónia Calhau
Food Safety Authority

Gregória Caeiro Von Amann
General Directorate of Health (DGDS)

Mário Capucho Reis
Institute of Nuclear Technology (ITN)

Maria do Carmo Palma
Portuguese Environment Agency

Maria do Céu Machado
Ministry of Health

Paolo Diegues
General Directorate of Health (DGDS)

Rita Ferreira
Water Services Authority

Fernanda Gomes
Water Institute, Ministry of Environment

Dília Jardim
Portuguese Environment Agency

Emilia Nunes
General Directorate of Health (DGDS)

Ana Bárbara Oliveira
General Directorate of Agriculture

João Miguel Oliveira
Institute of Sport

Cesaltina Ramos
General Directorate of Health (DGDS)

José Robalo
Ministry of Health

Pedro Rosário
General Directorate of Health (DGDS)

José Manuel Salvado
Water Institute, Ministry of Environment

Maria João Seabra
Food Safety Authority

Vitorino Semeano
General Directorate of Economic Activities

Teresa Torcato
Portuguese Environment Agency

Rodrigo Valador
National Road Safety Authority

Catarina Venâncio
Portuguese Environment Agency

Paula Viana
Portuguese Environment Agency

Regina Vilão
Portuguese Environment Agency

Cláudia Weigert
General Directorate of Health (DGDS)

REPUBLIC OF MOLDOVA

Valeriu Pantea
Ministry of Health

Ion Shalaru
National Centre for Public Health

Eugene Verlan
Ministry of Environment

ROMANIA

Maria Alexandra Cucu
University of Medicine and Pharmacology

Mihaela Dragusanu
University of Medicine and Pharmacology

Adriana Galan
Institute of Public Health Bucharest (IPHB)

Anca Tudor
Institute of Public Health Bucharest (IPHB)

RUSSIAN FEDERATION

Andrey Guskov
Federal Service for Surveillance on Consumer
Rights Protection and Human Well-being

SERBIA

Tatjana Bajic
Ministry of Health

Demir Hadzic
Road Safety Department
Ministry of Infrastructure

Tanja Knezevic
Institute of Public Health of Serbia

Natasa Lazarevic
Ministry of Health

Nikola Maletic
Ministry of Youth and Sport
Branislava Matic
Institute of Public Health of Serbia

Gordana Pantelic
Institute of Occupational and Radiological Health

Elizabet Paunovic
Ministry of Health

Milena Paunovic
Ministry of Health

Kristina Peric
Ministry of Environment and Spatial Planning

Tihomir Popovic
Environmental Protection Agency

Valentina Radjenovic
Ministry of Environment and Spatial Planning

Slavica Simic
Ministry of Environment and Spatial Planning

Ivan Stankovic
Faculty of Pharmacy
Belgrade University

Dusanka Stanojevic
Ministry of Environment and Spatial Planning

Zoran Tesic
Ministry of Environment and Spatial Planning

SLOVAKIA

Martina Behanova
Public Health Authority of the Slovak Republic
(NAPH)

Lydia Bekerova
Ministry of Environment of the Slovak Republic

Silvia Benzeova
Public Health Authority of the Slovak Republic
(NAPH)

Miriam Fecenkova
Ministry of Economy of the Slovak Republic
(NAPH)

Katarína Halzlová
National Public Health Authority of the Slovak
Republic (NAPH)

Michal Jajcaj
Public Health Authority of the Slovak Republic
(NAPH)

Eva Jozzefiova
National Public Health Authority of Slovak
Republic (NAPH)

Zuzanna Kotrcova
Public Health Authority of the Slovak Republic
(NAPH)

Karol Meliska
Ministry of Transport, Posts and
Telecommunications of the Slovak Republic

Robert Ochaba
Public Health Authority of the Slovak Republic
(NAPH)

Petra Olvecká
Public Health Authority of the Slovak Republic
(NAPH)

Pavol Ragan
Public Health Authority of the Slovak Republic
(NAPH)

Stefan Rakovsky

Public Health Authority of the Slovak Republic
(NAPH)

Robert Sasai

Ministry of Environment of the Slovak Republic

Katarina Slotova

Public Health Authority of the Slovak Republic
(NAPH)

Gabriela Slováková

Public Health Authority of the Slovak Republic
(NAPH)

SLOVENIA**Urska Blaznik**

National Institute of Public Health (IZVA)

Ivanka Gale

National Institute of Public Health (IZVA)

Metka Horvat

Institute of Public Health

Sonja Jeram

National Institute of Public Health (IZVA)

Helena Koprivnikar

National Institute of Public Health (IZVA)

Bonia Miljavac

Institute of Public Health

Lea Peternel

Ministry of Health

Ales Petrovic

National Institute of Public Health (IZVA)

Anton Planinsek

Ministry of Health

Andreja Selinger

National Institute of Public Health (IZVA)

Damijan Skrk

Ministry of Health

Simona Ursic

Institute of Public Health

SPAIN**Elena Isabel Boldo Pascua**

Institute of Health Carlos III Foundation for
International Cooperation and Health (FCSAI)

Mario Cárđaba Arranz

Ministry of Health and Consumer Affairs

Fernando Carreras-Vaquero

Ministry of Health and Social Policy

Maria José Carroquino Salto

Institute of Health Carlos III Foundation for
International Cooperation and Health (FCSAI)

Gloria Hernández Pezzi

Institute of Health Carlos III
National Centre of Epidemiology

Margarita Palau Miguel

Ministry of Health and Consumer Affairs

Manuel Posada de la Paz

Institute of Health Carlos III Foundation for
International Cooperation and Health (FCSAI)

Elina Valcarce de Angulo

Ministry of Health and Consumer Affairs

SWEDEN**Olle Åberg**

National Board of Housing, Building and Planning

Yvonne Andersson

Swedish Institute for Infectious Disease Control

Peter Berkvist

Swedish Chemicals Agency

Anders Bergman

National Food Administration

Cecilia Birgersson

Swedish National Institute of Public Health

Nina Cromnier

Ministry of the Environment

Asa Ersson

Swedish Road Administration

Anna Jansson

Swedish National Institute of Public Health

Hans-Olof Karlsson Hjorth
National Board of Housing, Building and Planning

Helen Keskitalo
National Board of Health and Welfare

Torbjörn Lindberg
National Food Administration

Henrik Moberg ^{a)}
National Board of Health and Welfare

Karin Molander-Gregory
Swedish National Institute of Public Health

Ing-Marie Olsson
National Board of Health and Welfare

Margareta Palmquist
National Board of Health and Welfare

Helena Parkman
Swedish Chemicals Agency

Michael Ressner
National Board of Health and Welfare

Jan Schyllander
Swedish Civil Contingencies Agency

Greta Smedje
Uppsala University Hospital

Anna Stamblewski
Swedish National Institute of Public Health

Lisen Sylwan
Swedish National Institute of Public Health

Kerstin Wennerstrand
Ministry of the Environment

Ulf Wester
Swedish Radiation Protection Institute

SWITZERLAND

Petra Aemmer
Swiss Federal Office for Public Health

Michael Anderegg
Swiss Federal Office for Public Health

Martin Brian
Swiss Federal Office for Sports

Gerard Donzé
Swiss Federal Office for Public Health

Beat Gerber
Swiss Federal Office for Public Health

Christoph Jahn
Federal Roads Office

Colette John-Grant
Swiss Federal Office for Public Health

Anne Levy
Swiss Federal Office for Public Health

Nadja Mahler König
Swiss Federal Office for Sports

Clara Murbach
Swiss Federal Office for Public Health

Robert Nyffenegger
Swiss Council for Accident Prevention

Franz Perrez
Swiss Federal Office for Public Health

Georges Roserens
Swiss Federal Office for Public Health

Ulrich Sieber
Swiss Federal Office for the Environment

Peter Straehl
Swiss Federal Office for the Environment

Pierre Studer
Swiss Federal Office for Public Health

Ursula Ulrich-Vögtlin
Federal Office for Public Health

Roger Waeber
Swiss Federal Office for Public Health

TAJKISTAN

Timur Nazarov
Committee on Environmental Protection

Alimakhmad Sufiev
Service of State Sanitary and Epidemiological Surveillance

TURKEY

Biriz Cakir
Ministry of Health

Cengiz Kesici
Ministry of Health

Yüksel Söyleriz
Ministry of Health

Senol Yilmaz
Ministry of Health

UZBEKISTAN

Komil Mukhamedov
Ministry of Health

THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Dragan Gjorgjev
Institute of Public Health

Vladimir Kendrovski
Republic Institute for Health Protection

Mihail Kocubovski
Republic Institute for Health Protection

Gordana Ristovska
Institute of Public Health

Fimka Tozija
Republic Institute for Health Protection

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

Paul Holley
Department of Health

Gordon Nichols
Health Protection Agency

Babatunde Olowokure
Health Protection Agency

Kathy Pond
Robens Centre for Public and Environmental
Health, University of Surrey

Patrick Saunders
Health Protection Agency

Noah Scovronick ^{a)}
London School of Hygiene and Tropical Medicine

ORGANIZATIONS

Nida Besbelli ^(b)

United Nations Environment Programme
Geneva, Switzerland

Dorota Jarosinska

European Environment Agency,
Copenhagen, Denmark

World Health Organization

WHO Regional Office for Europe

Roger Aertgeerts ^(b)

Maura Beaton

Matthias Braubach ^(a)

Dafina Dalbokova ^{(a), (c)}

Nicoletta di Tanno

Eva-Maria Euchner

Christian Gapp

Sonja Kahlmeier ^(b)

George Kamizoulis ^(b)

Rokho Kim ^(a)

Hilde Kruse ^(b)

Michal Krzyzanowski ^{(a), (c)}

Lucianne Licari

Sonja Meemboor

Leda Nemer

Francesca Racioppi ^(b)

Christian Schweizer ^(a)

Dinesh Sethi ^(b)

Trudy Wijnhoven ^(b)

WHO headquarters

Roberto Bertollini ^(b)

Philipp Lambach

Gerry Moy

Seongsoo Park

Angelika Tritscher ^(b)

a) Co-author

b) Reviewer

c) Project leader

The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

Member States

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
Lithuania
Luxembourg
Malta
Monaco
Montenegro
Netherlands
Norway
Poland
Portugal
Republic of Moldova
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Tajikistan
The former Yugoslav Republic of Macedonia
Turkey
Turkmenistan
Ukraine
United Kingdom
Uzbekistan



World Health Organization
Regional Office for Europe
Scherfigsvej 8, DK-2100 Copenhagen Ø, Denmark
Tel.: +45 39 17 17 17 Fax: +45 39 17 18 18 E-mail: postmaster@euro.who.int
Web site: www.euro.who.int

