ENHIS INDICATORS - ENVIRONMENTAL DETERMINANTS - A COUNTRY BASED REPORT

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Abstract. The Romanian environmental health status features, as reflected by the internationally available data, are reviewed in order to draw attention to future intervention priorities for the decision makers. ENHIS (Environment and Health Information System) indicators have been elaborated as responding to the important amount of the effects attributable to environmental factors a system of environmental health indicators, children specific, and the supporting tools for data collection and reporting was elaborated in line with the CEHAPE (The Children Health Action Plan for Europe), Budapest, 2004 and EU strategy. The ENHIS indicators, focused on children's health, demonstrate the important contribution of environmental determinants on global burden of diseases.
Key words: environmental determinants, indicators, accessibility, policies, burden of diseases

Rezumat. Analiza caracteristicilor sănătății în relație cu mediul pe baza indicatorilor ENHIS (Sistemul Informațional de Mediu și Sănătate), care constituie obiectul prezentului studiu, își propune să evidențieze principalele arii sensibile și deci direcții în care intervențiile sănătății publice trebuie pe viitor concentrate. Indicatorii ENHIS au fost elaborați în conformitate cu angajamentele asumate cu prilejul celei de a patra Conferințe Ministeriale pentru Sănătate și Mediu de la Budapesta din 2004 și a Planului de Acțiune pentru Sănătatea Copiilor (CEHAPE), adoptat cu acest prilej, precum si cu liniile strategice principale ale sănătății publice la nivelul Uniunii Europene. ENHIS, focalizați pe sănătatea copiilor, demonstrează importanta contribuție a determinanților de mediu în povara globală a bolilor.
Cuvinte cheie: determinanți de mediu, indicatori, accesibilitate, politici, povara bolilor

INTRODUCTION
Environmental factors, even less visible than other health determinants, as unhealthy behaviors or health services, are responsible for approximately a quarter of the global burden of disease (1). Children, under the age of 5, the most vulnerable group, bear over 40% of this burden (2). Even if most of the deterministic processes leading to these diseases are multifactorial, there is increasing evidence that these diseases are influenced by environmental factors. Exposure to air pollution, lead, chemicals and noise has been shown to impair children's health and their cognitive development (3, 4, 5).

The environmental contribution to the global burden of disease dominant categories is illustrated in figure 1 (6). More, air quality, poor housing, food and drinking-water are particular environmental factors affecting health and mostly in developing regions of the world (5). An estimated 1.7 million deaths a year globally are attributed to unsafe water, sanitation and hygiene; nine out of ten of these deaths occur in children and nearly all of these occur in developing countries (1).
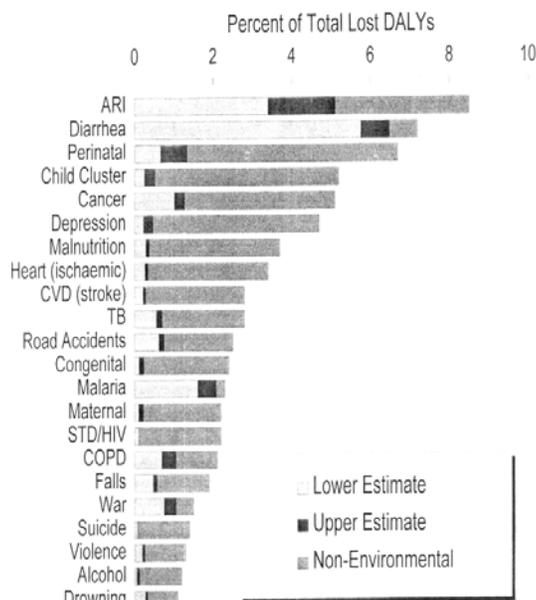
Fig. 1. Global Ill Health Is Attributable to Environmental Factors by Smith KR, CF Corvalan, and T Kjellstrom (6)

Due to their specific vulnerability, lack of possibility of exposure control, but also because exposure occurring early, during childhood, is influencing the health status for the rest of their lives, children must be the target of the public health coordinate interventions (7). Despite the fact that the European Region contains some of the world's wealthiest countries, health inequalities are still persisting, diseases such as asthma, leukaemia and cancer, learning disabilities, and congenital malformations are increasing in children in Western Europe, while the eastern part of the Europe is still facing, additionally, an important burden of infectious diseases (8).

In this context, the Fourth Ministerial Conference on Environment and Health, held in Budapest, Hungary in June 2004 ('The Budapest Conference'), focused on "The future for our children", recognizing the need to address the rights of children, their health, and their particular vulnerability towards environmental risks, as well as to respond to emerging environmental concerns. The Declaration from the Conference reaffirmed that the Environment and Health Information System (EHIS) is an essential tool for policy-making relevant to children's environmental health (WHO Regional Office for Europe 2004b) (9).

The Children Health Action Plan for Europe (CEHAPE) (10), adopted by The Conference, represents an international instrument negotiated with Member States to develop and

manage environmental health indicators. The CEHAPE sets four Regional Priority Goals (RPGs) which envisages key themes for action on children's health in relation to environmental factors. Concisely these are:

1. gastrointestinal health related to safe water and adequate sanitation;
2. healthy and safe transport, mobility and home environment to reduce injuries and enhance physical activity;
3. respiratory health and clean air;
4. health through environment free of hazardous chemicals, physical and biological factors.

Following the global political commitment and in accordance with the EU health Information and Knowledge Strategy (11), through a series of projects (ENHIS 1 and 2 projects) co-funded by the Directorate-General for Health and Consumer Protection (DG SANCO) of the European Commission (EC) and coordinated by WHO (World Health Organization) a comprehensive information and knowledge system was developed and became operational for 18 member states. Romania through the Institute of Public Health Bucureşti has been involved as leading partner, within activities of indicators analysis, data retrieval and management, reporting mechanism, web portal, methodologies for 26 indicators addressing the four CEHAPE regional priority goals.

The system represents a prototype of an evidence-based system to support children's health and environmental policies in the European Region.

It is design to allow the monitoring of policies and actions taken, facilitate inter-country comparisons and time trends analysis, also ensuring timely access to information and its effective dissemination.

The core set, available on the ENHIS web portal is showed in table 1 (12, 13).

The ENHIS system also includes: methodological guidelines for the indicators giving the rationale, definition, required data elements, calculation method, data sources, interpretation and policy relevance are integrated in the system. The indicators are elaborated in the DPSEEA chain (12, 13):
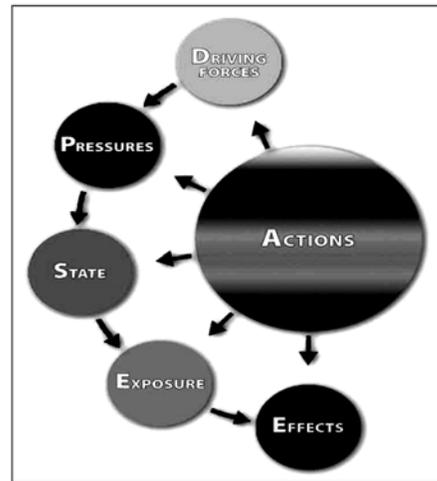

Fig. 2. The DPSEEA framework (12, 13)

Table 1. Overview of the core set of the EH indicators (12, 13)

No.	Title
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
2.5.	Policies to promote safe mobility and transport for children
2.6.	Policies to reduce and prevent unintentional injuries from falls, drowning, poisoning, fires and choking
2.7.	Policies to reduce and prevent excess body weight and obesity in 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 environmental tobacco smoke
3.5.	Children living in homes with problems of damp
3.6.	Proportion of children living in homes using solid fuel
3.7.	Policies to reduce the exposure of children to environmental tobacco smoke
4.1.	Incidence of childhood leukaemia
4.2.	Incidence of melanoma in people aged under 55 years
4.3.	Persistent organic pollutants (POPs) 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
4.8.	Policies to reduce the excessive exposure of children to ultraviolet radiation

An information base has been created for the 26 children's EH indicators using international databases, case studies based on surveys in selected countries and examples of child-specific policies.

Also reporting methods and tools for indicator fact sheets and periodic

indicator-based assessments were designed for decision-makers. They provide evidence clearly and concisely to support the development of action which benefits public health and the environment, and to track the progress of its implementation. Fact sheets have been prepared for the 26 indicators. Following an evaluation and revision process, they have been integrated into the information base.

Concluding, the system provides the technical and organizational infrastructure capable of tracking progress in the implementation of the national and European environmental health policies, focusing on those related to CEHAPE.

Methodology

A descriptive observational study relying on the ENHIS available indicators for Romania on the ENHIS web site, aiming to identify the main features of the environmental health for Romania, as a signal for further decision and interventions for promoting and protecting public health.

RESULTS AND DISCUSSIONS

Environmental background

Romania's past focus on heavy industry and unsustainable production and transport models has generated a general wide spread industrial pollution. According to environmental performance observer, toxic air emissions, industrial waste pollution in waterways represented the most significant environmental hazard in Romania (14). However, beginning with 2004 impending membership in the European Union (EU) has stimulated substantial upgrading of environmental monitoring

and legislation in order to comply with EU standards by 2007.

In 2006 the European Commission listed Romania's two main remaining issues as increased transparency of environmental decisions and improved waste management (15).

Environmental Burden of disease

The WHO 2007 country profile for the Environmental Burden of Disease (EBD) reveals an EBD per year for the statistical year 2004 of 31 DALYs/ 1000 capita, 47000 deaths attributable to environmental factors, representing a percent of 17% of total burden of disease (16).

The country EBD by main disease categories in DALY/1000capita per year was as following:

Table 2. Daly main disease category EBD% (16)

Disease category	DALY/‰ cap
Diarrhoea	0.4
Respiratory infections	2.0
Lung cancer	1.3
Other cancers	3.1
Neuropsychiatric disorders	2.4
Cardiovascular diseases	8.0
COPD	0.7
Asthma	0.3
Musculoskeletal diseases	1.5
Road traffic injuries	1.3
Other unintentional injuries	5.8
Intentional injuries	0.7

RPG 1 indicators

It includes indicators focusing on the quality, accessibility of drinking water, bathing water and their effects on health, as in the table 3 (16).

Table 3. RPG 1 indicators (16)

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

Despite the existence of surveillance systems for waterborne outbreaks, quality of drinking water and also for authorised natural bathing water the lack of transparency and availability of data where recorded as blank areas on the EH map.

The indicator on public water supply and access to improved water sources estimates the achievement of the minimum requirements for access to an adequate supply of piped and safe water in the home. It is a core indicator for risks related to water and hygiene. The EUROSTAT data, from figure 3, covering 22 countries in Europe, reveals a clear East-West gap, Romania, being in on of the worst situation regarding the continuous access to adequate amounts of safe drinking-water at home (17).
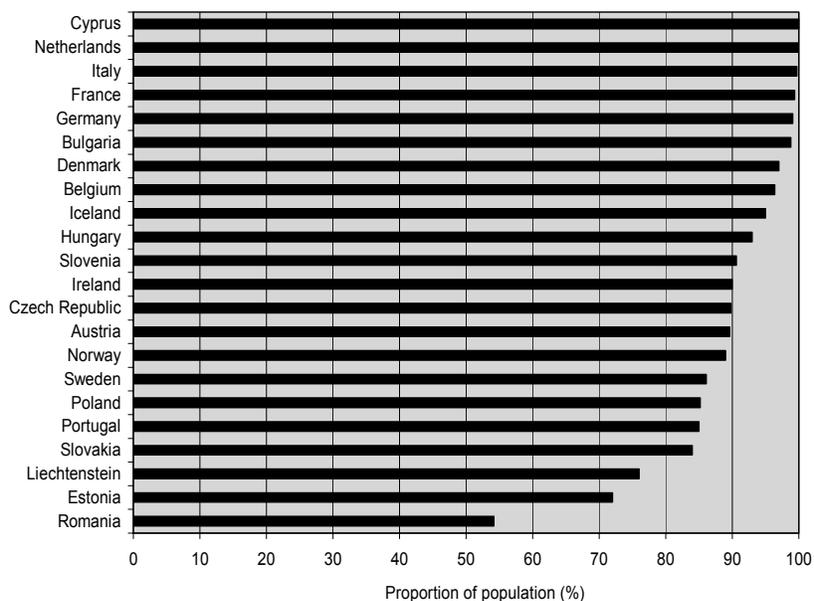

Fig. 3. Proportion of population connected to public water supply in Europe, 2002, or latest available (17)

The statistics of the UNICEF/WHO Joint Monitoring Programme database, gives a broader view of situation in the Region revealing the same worst situation especially for rural areas and reveals that an important proportion of the population has poorer access to improved drinking-water sources, particularly in rural areas, where less than 20% of the population has adequate accessibility to improved water sources. The comparative analysis for the WHO Euro region is illustrated in figure 4 (18).
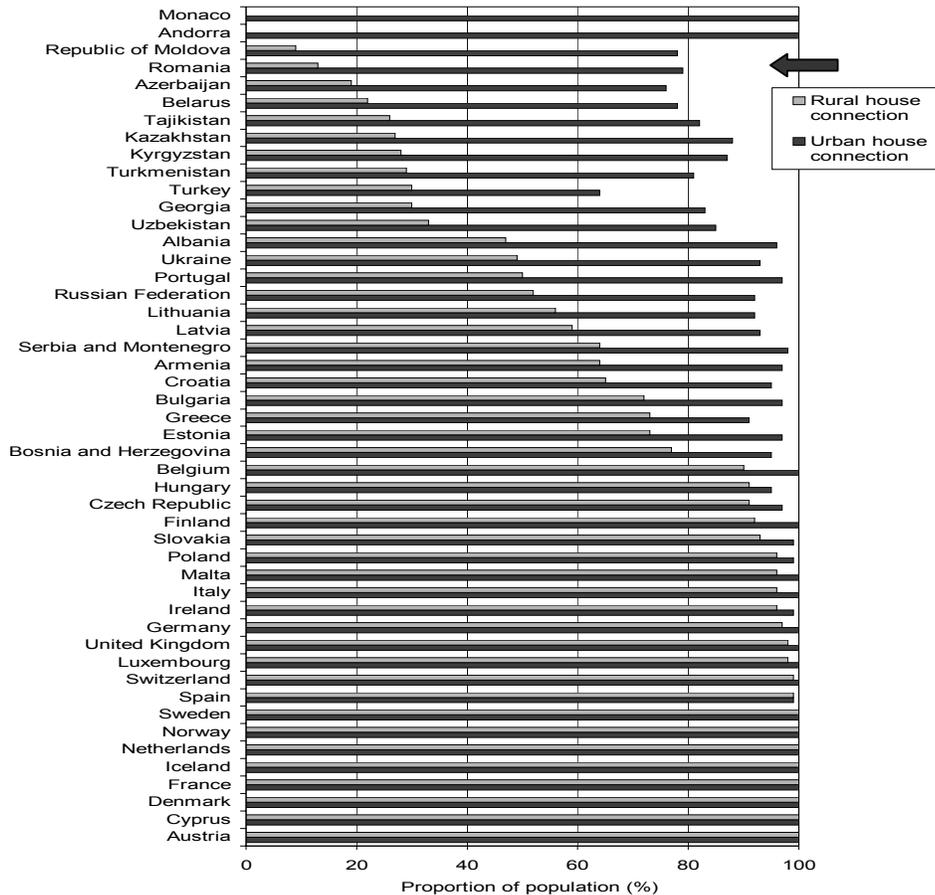

Fig. 4.   Percentage of the population with access to an improved water supply in urban and rural areas, WHO European Region, 2004 or last available year (18)

Even the indicator estimates mostly the proportion of the general population with access to piped water in the home, it also provides an estimate of the number of people, including children who are potentially exposed to water-related health risks, which is one of the greatest of the EU,

including Romania behind countries as Tajikistan, Kazakhstan, Albania, with relative lower income and less economic potential.

If additionally we consider the quality criteria's compliance for those Romania received the longest transition period from the all integrated countries, we might have a clearer view of the associated health risks for the population health, accounting directly and mostly indirect to the significant values of the total burden of disease in the Eastern European region.

In this context, fostering advocacy and partnership for rural development, massive investments in most vulnerable regions must be a priority where action should be taken to increase the proportion of the (child)

population with access to safe drinking-water.

Wastewater treatment and access to improved sanitation indicator estimates the potential level of pollution from domestic point sources, entering the aquatic environment and the associate percentage of the population at risk of infection via the faecal-oral route, especially diarrhoeal diseases, due to the absence of adequate sewage and sanitation disposal systems.

The Eurostat data situates Romania, again in one of the worst situation, especially for rural areas where the population connected to a sewerage system, (private septic tanks or dry sanitation where excluded) is less than 10%, on of the last places within the EU region (fig. 5) (18).
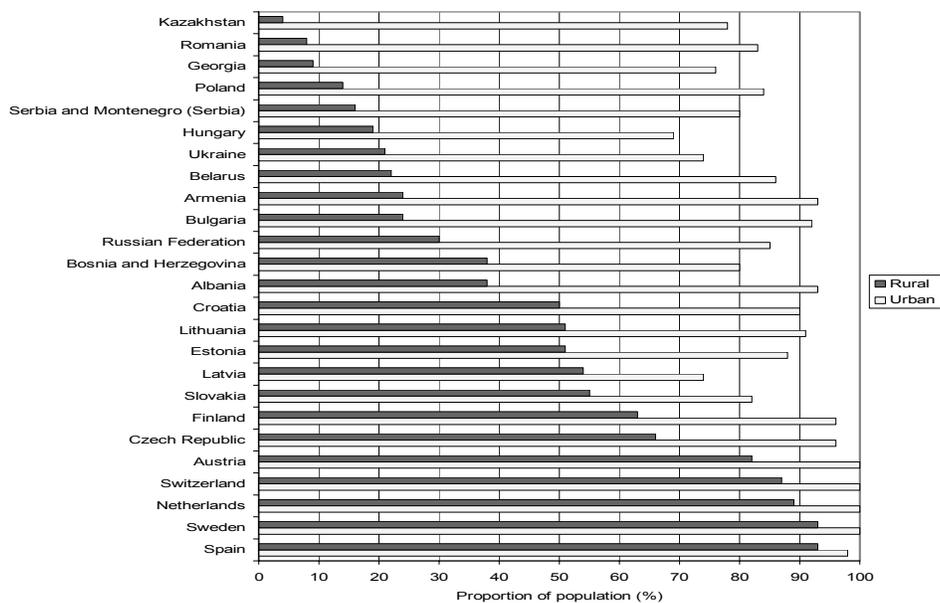

Fig. 5. Percentage of the population connected to sanitation facilities in urban and rural areas, 2004 (18)

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In order to comply the Directive concerning urban wastewater treatment requirements Romania will receive substantial support for improving the wastewater treatment for all agglomerations of more than 2000 population equivalents (p.e.) with collecting systems (19).

Secondary (biological) treatment must be provided for all agglomerations of more than 2000 p.e. discharging into fresh waters and estuaries and for all agglomerations of more than 10 000 p.e. discharging into coastal waters.

Still small, numerous rural zones, where many environmental risk factors are aggregated are not included in those EU supported areas. That's why special emphasis should be paid for supporting their development too.

RPG 2 indicators

The second priority strain consist in indicators focusing on road traffic accidents, unintentional and external causes injuries, safe mobility and transport for children and policies to reduce and prevent excess body weight and obesity in children and adolescents, as illustrated in table 4 (20).

Table 4. RPG 2 indicators (20)

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
2.5.	Policies to promote safe mobility and transport for children
2.6.	Policies to reduce and prevent unintentional injuries from falls, drowning, poisoning, fires and choking
2.7.	Policies to reduce and prevent excess body weight and obesity in children and adolescents

The indicator on mortality from road traffic injuries in children and young people focused on one of the preventable leading cause of death in children and young people (aged 5–24 years). The WHO health for all mortality, database reveals in figure 6 rather high SMRs occurring in both high- and low-income countries, Romania being apparently in a middle position (fig. 6) (20). But if we consider the fact that in our country the number of cars is about a quarter of the amount in developed countries, the intensity of phenomena is far bigger then is seems.

As these are preventable through the concerted efforts for the implementation of effective measures addressing leading risk factors, further efforts should be made for saving young's lives, through more concrete action for educating the youngsters.
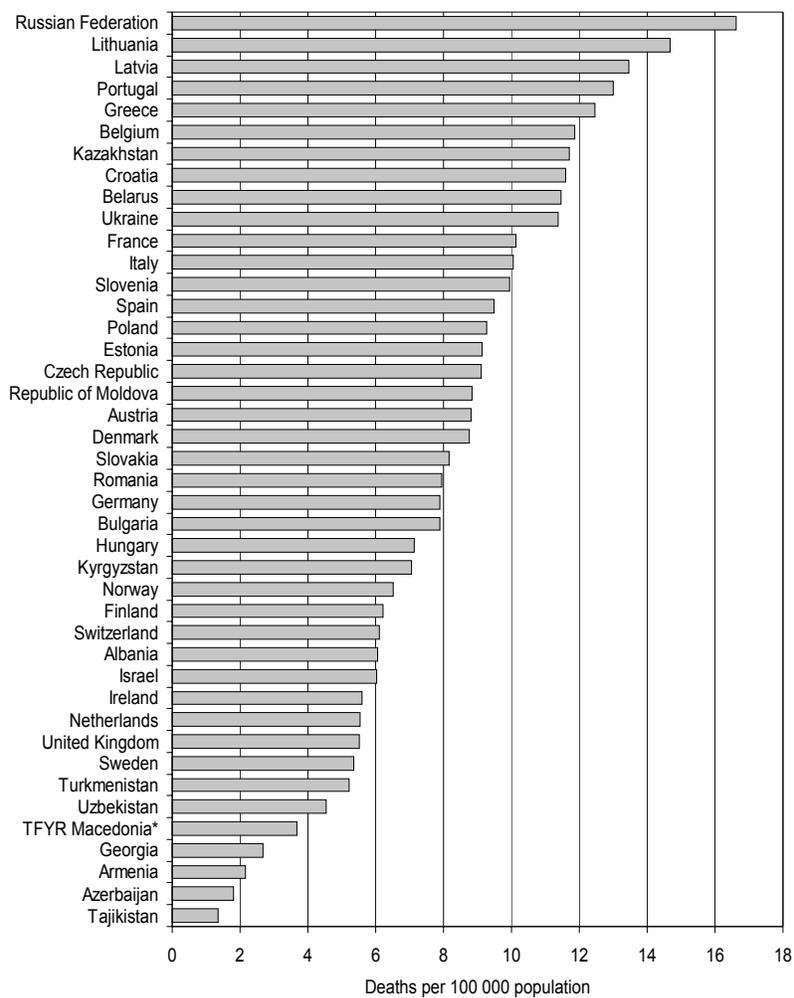
**Fig. 6. SMRs for RTIs 0–24 averages for 2002–2004
or the most recent three years (20)**

Mortality in children and adolescents from unintentional injuries (falls, drowning, fires and poisoning) addresses another important contributor of the Global burden of disease in the Region (20, 21). The data from the WHO European mortality database, even illustrating an East-West gap are constantly situating Romania the fifth place, with higher mortalities due to fallings, as in figure 7 (21).
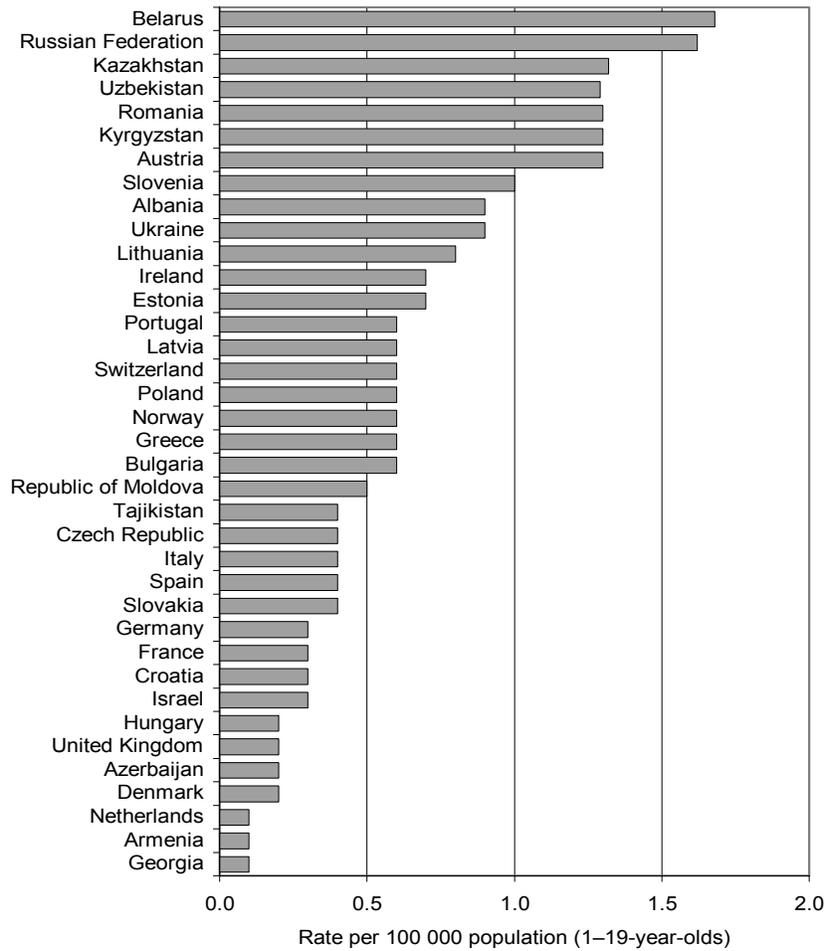

Fig. 7. SMRs for fallings (21)

Also the deaths reported for poisoning, is signalling a need for further urgent, convergent actions to be taken (fig. 8) (21).
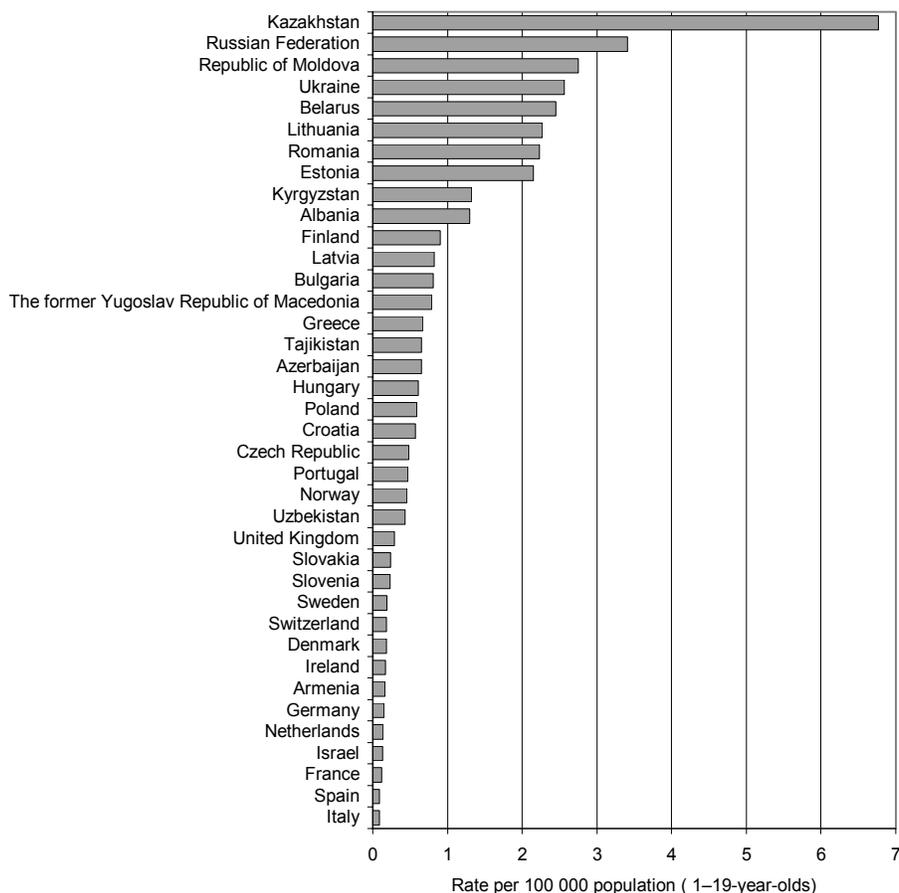

Fig. 8. SMRs for poisoning (21)

The action indicator regarding policies to reduce and prevent excess body weight and obesity in children which are among the leading risk factors accounting for the burden of non-communicable diseases (22). The indicator reflects the degree of implementation of 12 specific policies in 5 broad policy areas aimed at preventing excess body weight and obesity in children. The most important policies assessed for implementation are presented in table 5.

Table 5. Key policies for preventing obesity (22)

Policy topic	Key policies to reduce and prevent obesity
Marketing/ labelling	Legislation requiring labelling of foods with nutritional information such as ingredients and the corresponding energy intake
	Legislation to practise responsible advertising and marketing of food, particularly with regard to promotion and marketing aimed at children of foods high in saturated fats, trans-fatty acids, free sugars and salt
Healthy diet and nutrition	National strategy to promote and increase the consumption of fruit, vegetables and legumes and to reduce the consumption of saturated fats, sugars and the elimination of trans-fatty acids
	Written policy document, adopted by a political body, explicitly concerned with nutrition
	Set of recommended nutrient reference values
Physical activity	Legislation requiring a minimum of 30 minutes of physical activity per day in schools
Education/ awareness /research	Health and nutrition education and awareness programmes in schools
	National health survey or participation in an international health survey that allows the monitoring of the prevalence of obesity, eating habits, physical activity and health in children
Implementation structures/ collaboration	Special administrative structure with responsibility for implementation of the policy
	Nutrition council or other advisory structure responsible for providing scientific advice to national policy-makers
	Any form of regular government-initiated collaboration between the parties responsible for food production, manufacture and sale, control and legislation and nutrition education
	Any form of regular consultation between the ministries of health and of agriculture on matters related to nutrition

Data computed on the basis of a specific questionnaire fill in by experts of the participating countries where the total score for degree of implementation is the sum of the scores for each policy: 0 = no policy; 1 = partly implemented or enforced; 2 = substantially implemented or enforced (fig. 9) (22, 23).

Romania is again in an unfavorable position, one of the last places, the majority of the score being associated with the requirements of the EU legislation, transposed legislation and partially enforced, than to concrete, public health interventions.

Facing new behavioural patterns, the limited available resources versus expensiveness of fruit and vegetables, the commercial success of the junk food culture it is expected that the Romanian trends for over-weight and even obesity, to raise sharply. In this context there are necessary effective, coherent, multisectoral approach, including comprehensive long-term policy measures and active nutritional interventions in school, workplace and community.
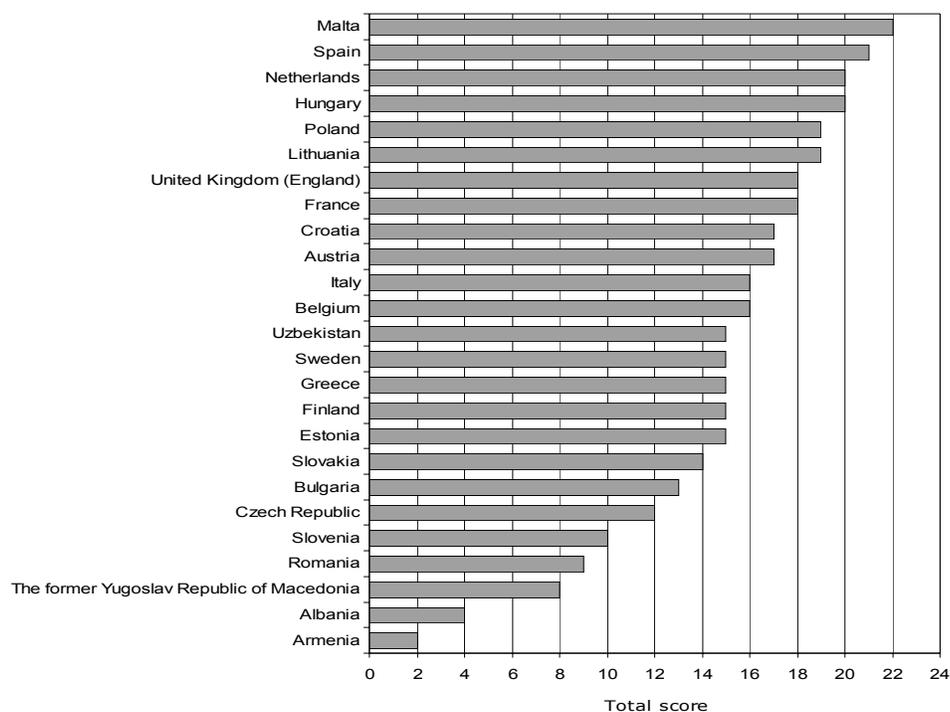
Fig. 9. Degree of implementation of the 12 targeted policies 2005–2006 (22)

RPG 3 indicators

The third priority goal indicators are concentrated on air quality and its effects on children health, including 7 indicators as illustrated in the table below.

Table 6. RPG III indicators (24)

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 environmental tobacco smoke
3.5.	Children living in homes with problems of damp
3.6.	Proportion of children living in homes using solid fuel
3.7.	Policies to reduce the exposure of children to environmental tobacco smoke

Exposure of children to air pollution in outdoor air estimates the child population-weighted exposure based on the annual mean particulate matter (PM_{10}) concentration in cities and total (all age) city populations. The measure of exposure combines the PM10 concentration and the size of the population subject to the exposure. The health relevance of the indicator is one of the most valuable for the health and environment association.

According to existing evidences children are particularly sensitive to air pollutants, effects from those to foetus reflected by the levels of post-neonatal mortalities to well-known effects on lung function, aggravation of asthma or respiratory symptoms, increased prevalence and incidence of cough and bronchitis, to increased levels of mortality in adults (23). The indicator computed, based on internationally available data from AirBase and EUROSTAT, reveals that most people in European cities (where PM_{10} is monitored) are exposed to PM_{10} levels exceeding the WHO air quality guideline (AQG) levels (of 20 $\mu g/m^3$) (fig. 10) (24, 25).
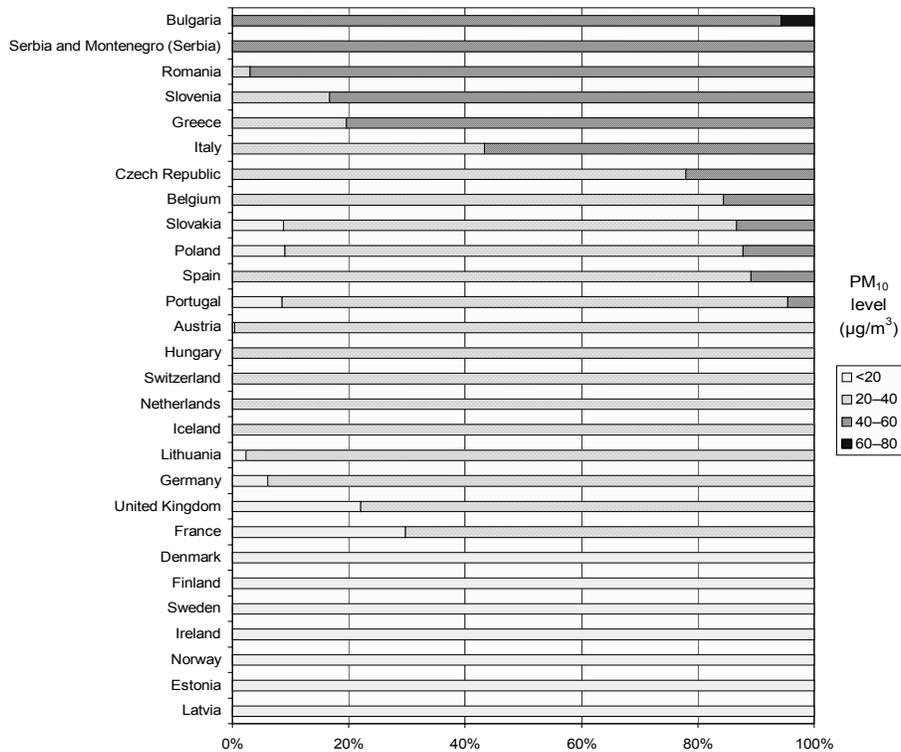

Fig. 10. Percentage of children living in cities with various PM_{10} levels, 2004 (or last available year) (24, 25)

The exposure feature for Romania situates us, again, in one of the worst position, with a PM_{10}-weighted mean of 53 μg/m^3, even above the European Union (EU) limit value (of 40 μg/m^3) for more than 80% of the reference population, generating a substantial risk to children's health. Even the PM_{10} data coverage reflects the situation only for 3 cities, and 21% of the urban population, it represents an issue requiring measures for integrative management of PM exposure, in order to reach the EU targets of a mean PM10 of 40 μg/m3 for 2005 and 20 μg/m3 in 2010, in line with the Clean Air for Europe programme and the proposal for the new EU air quality directive, and consequently, to ensure an improved children health (26, 27).

The effect indicator on post neonatal mortality from respiratory diseases gives an indirect assessment of the adverse impact on health of environmental factors in a vulnerable age group. Studies have proved a positive association between the level of air pollutants and mortality in children due to respiratory causes. Several other social and environmental factors are contributing to premature deaths, as quality of housing, energy type, heating system, tobacco smoke and seasonality.

The WHO mortality database figures present the average of number of post-neonatal deaths due to respiratory diseases, showing for Romania one of the highest mortality rates for nearly all countries (fig 11) (23).
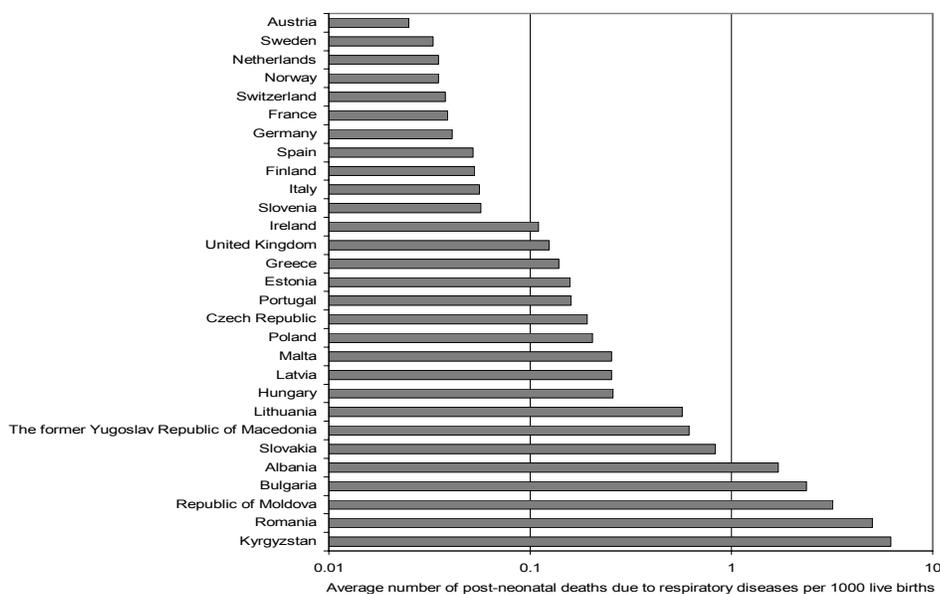

Fig. 11. Post-neonatal mortality rate due to respiratory diseases, WHO European Region, 2001 (23)

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If we consider the fact that respiratory mortality are one of the major contributors to the overall post-neonatal and also infant mortality rate, highlighting, in worse, Romania among the EU countries, a need for more effective intervention could be foreseen.

The prevalence of asthma and allergies in children, another effect indicator illustrating the prevalence rates of symptoms of asthma and allergic rhino-conjunctivitis in children aged 6–7 years and 13–14 years, point out another priority issue of concern for the environmental health, closely associated with indoor and outdoor air quality. Early diagnosis and adequate treatment can avoid long lasting effects, associated costs and health impairments. Thus,

adequate management of disease should be completed with public health intervention both on health promotion and information but also on surveillance and control of environmental conditions that contributes to asthma and allergies, as policies for indoor air quality or house-dust allergens as mites or those from pets. The results of the International Study of Asthma and Allergies in Childhood (ISAAC), illustrates the prevalence of symptoms and diseases in selected centres (represented by cities/regions) participated in the study (fig. 12) (28). Still the comparisons between the centres show highest prevalence of asthma symptoms in children aged 13–14 years for asthma and rhino-conjunctivitis in Romania.
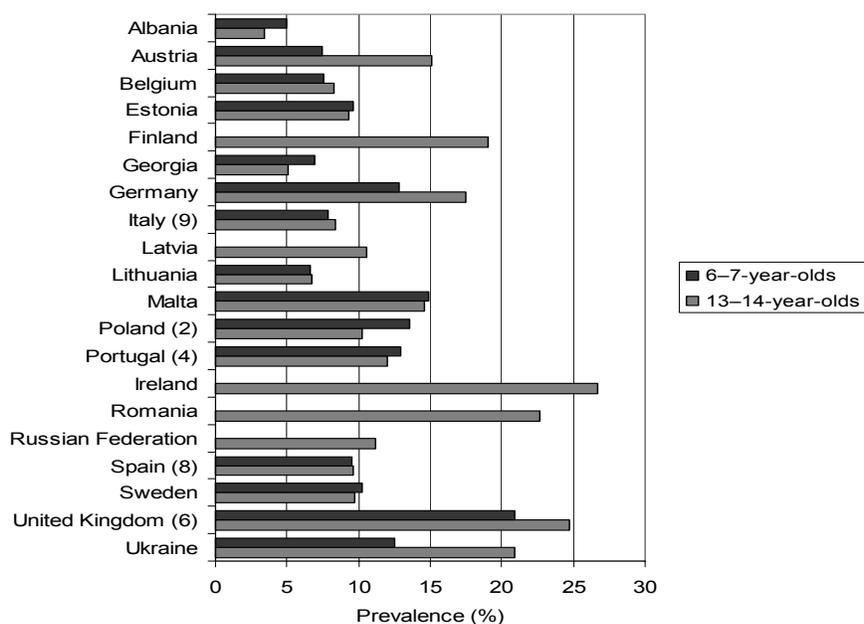

Fig. 12. Prevalence of asthma symptoms in children aged 6–7 years and 13–14 years, ISAAC Phase Three, 1999–2004 (28)

The action indicator on policies for reducing the exposure of children to environmental tobacco smoke is a composite index of commitment to reduce exposure to environmental tobacco smoke (ETS) and promote smoke-free areas for children. It is computed as a sum of the score of seven components, (0 – for no restriction or prohibition, 1 – for partial restriction, prohibition or voluntary agreement and 2 – for complete ban or prohibition) as following (29, 30, 31, 32):

1. Smoking prohibited in health care facilities
2. Smoking prohibited in education facilities
3. Smoking prohibited in bars and restaurants
4. Smoking prohibited in theatres and cinemas
5. Smoking prohibited in public transport vehicles
6. Advertisement of tobacco products in national mass media prohibited
7. Sale of tobacco to minors prohibited (combined component: sale of tobacco to persons aged under 16 years not allowed).

The indicator reflects the political commitment to transpose and enforce the WHO Tobacco Control Framework (FCTC), the first legal instrument designed to reduce tobacco-related deaths and disease around the world, that came into force in February 2005, ratified by Romania also in 2005, and in line with the European Union legislative measures on the prevention of smoking and tobacco control as well as the recently launched, in January 2007 Green Paper Towards a Europe free from tobacco smoke: policy options at EU level and opened a new strategy (29, 30, 31, 32).

The data computed in the WHO tobacco control database, for 2006, presented in figure 13 is situating this time Romania in a better position, in line with the EU legal requirements commitments (29).

This score reflects a more extensive scope and comprehensive policies. Still the indicator assesses the extent to which regulations covering public spaces exists and are enforced, being more an indirect measure of the exposure of children to ETS, especially at home.

RPG 4 indicators

The fourth priority goal indicators are concentrated on effects of physical and chemical hazards as: ultraviolet radiation, radon, lead, POPs, including items (tab. 7) (23).

Table 7. RPG III indicators (23)

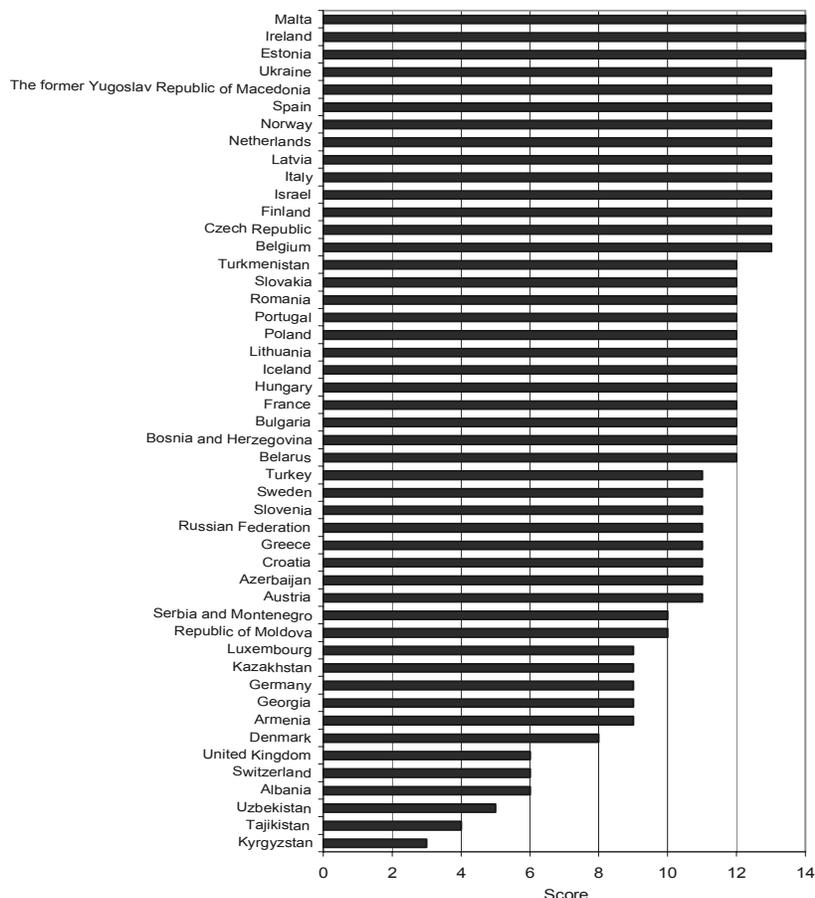| 4.1.	Incidence of childhood leukaemia
4.2.	Incidence of melanoma in people aged under 55 years
4.3.	Persistent organic pollutants (POPs) in human milk
4.4.	Exposure of children to chemical hazards in food
4.5.	Levels of lead in children's blood
4.6.	Radon levels in dwellings
4.7.	Work injuries in children and young people
4.8.	Policies to reduce the excessive exposure of children to ultraviolet radiation

Fig. 13. Implementation of policies to reduce exposure of children to ETS in the WHO EURO Region (29)

Data on indicators assessing the complex exposure of children to potentially hazardous chemicals in food, natural or manmade as aflatoxins, antibiotics, additives, metals, cleaning agents, pesticide residues, packaging materials, arsenic, polychlorinated biphenyls (PCBs), otherwise strictly regulated by the EU food safety legislation due to their severe, chronic and irreversible effects are not reported and internationally available, despite the long tradition public health existing monitoring system, in line with the WHO GEMS/Food system (33).

Probably the new institutional responsibilities split on the safe food issue generated a lack of continuity and consequently of availability of systematic information on these important exposures, both for general

but especially for children, who consume more food per kilogram of body weight than adults, experiencing a greater and longer exposure than adults.

That's why, on the list of the public health system priorities regarding the development and strengthening of the national food safety and nutrition programme, in accordance to the EU White Paper on Food Safety, convergent to the *Codex Alimentarius* system, to update the chemical contaminants surveillance and control should be addressed as another priority (34, 35).

Work injuries in children and young people

Data on work incidence rate of nonfatal injuries in children and young people, under 18 and between 18 and 24 years of age, recognized and legislative protected, as a specific risk group, due to specific risk factors as lack of experience, limited awareness, immaturity, form specific surveys (36).

Even if data where not available, and from the total number of 4764 work accidents reported for 2006 by the Labour Inspection some cases by sure are affecting the vulnerable group of young, sometimes temporary employed, actions have been started for awareness and preventing those accidents by the series of activities and guidelines elaborated during the 2006 European week dedicated to a safe start in professional life (37, 38).

Still efforts should be continued for specific monitoring and enforcement of the useful guidelines elaborated and preventing youngster's workplace injuries and illness, in line with the WHO Global Strategy on Occupational

Health for All and the EU Strategy on Occupational Safety and Health principles in a constructive health-labour –employers– employee partnership (39, 40).

The exposure indicator on the level of lead in the blood of children is based on data from several WHO leaded surveys reflects the lead exposure occurring from multiple sources, especially lead-containing petrol as the most important source of atmospheric contamination in the countries where it is still used but also from industrial processes, paint, water pipes.

The mean lead blood level shows for Romanian children a decreasing trend form levels of 18.2–18.9 μg/dl in the WHO 80s leaded studies to values about 10 μg/dl in 2000, mainly due to the beneficial effects of reducing the leaded petrol consumption (41, 42).

Unfortunately, the existing hot spots of industrial emissions are still influencing the level of lead in children's blood in the vicinity of the plants, realities requiring an operational, flexible surveillance system for identification and elimination of the remaining sources of exposure to lead and monitoring of the effectiveness of preventive action, according to the 77/312/EEC Directive on Biological Screening of the Population for Lead and the recently adopted strategic approach to international chemicals management for that minimize significant adverse impacts on the environment and on human health (43, 44).

The effect indicator on incidence of childhood leukaemia the most common childhood malignancy, and a potential cluster for many environmental

risk factors, as ionizing radiation exposure, electromagnetic fields, representing about 30% of all cancers diagnosed in children aged under 15 years, was included in the core set as a general environmental exposure marker (1).

Data from the Automated Childhood Cancer Information System (ACCIS), one of the lowest rate of standardized incidence of leukaemia in children aged under 15 years- 30 cases per million per year in Romania, in line with values from the Eastern European countries (fig. 14) (45). However data should be cautiously interpreted taking

in to account that the national cancer registry is not completely functional yet. As leukaemia is scientifically associated to various environmental exposures and the new Regulation of the European Parliament and the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) considers the carcinogenicity, mutagenicity and reproductive toxicity of chemical industrial substances as priority criteria for authorizing their use, the health system contribution in implementing the system could contribute to a better protection against chemical hazards (46).
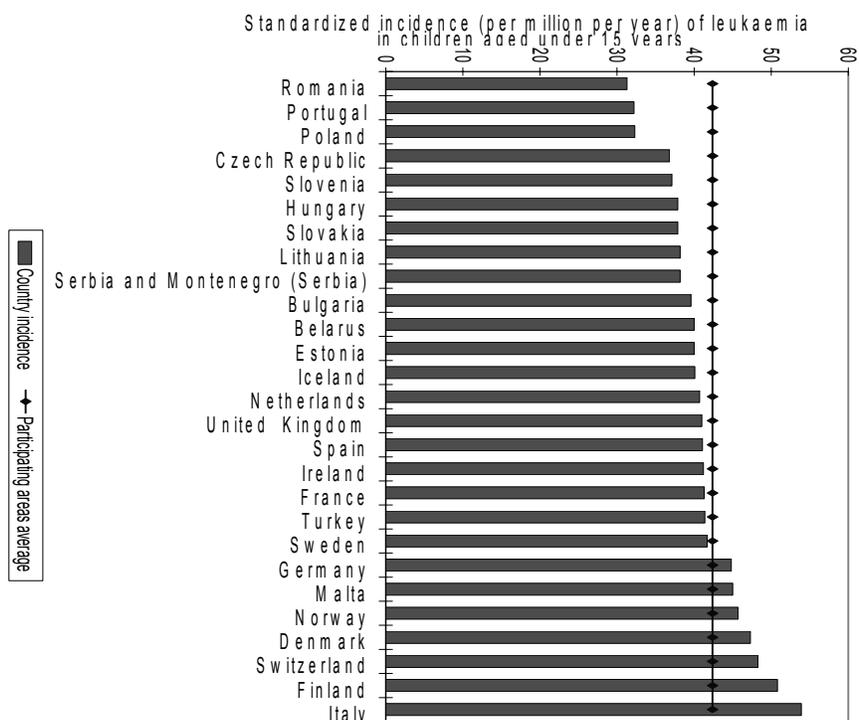
Standardized incidence (per million per year) of leukaemia in children aged under 15 years

Fig. 14. Standardized estimates of leukaemia in children aged under 15 years, selected countries, 1970–1999 (45)

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CONCLUSIONS

Farr from a holistic review, our approach is an argument for a comprehensive, compatible and systematic information system for environment and health at national level.

The availability of the information, reported for only 65 % of the indicators, despite the existing long tradition surveillance system, requires a serious rethinking and updating of the surveillance methodologies, intensive networking and regular reporting mechanisms.

The indicators mapping is a very useful tool for identifying issues of interest for future interventions and their evidence base background revealing several priority areas of intervention for Romanian environmental health.

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