Chemical safety agenda for Europe
- Priority public health actions beyond 2000 -

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Abstract

There are different strategies through which national authorities are improving the safe management of chemicals. In spite of all these efforts, the threat to human health posed by chemicals remains uncertain because of lack of knowledge about the exposures and possible impact on human health. This is mainly because people are exposed to many different chemical substances at the same time, and via several routes such as air, water, food, etc. It is known, however, that the exposure to different chemical pollutants may contribute to the same health outcome, and that the prevalence of non-communicable diseases are showing sharp increase in most of the European countries. Therefore, vigorous efforts to reduce the health risk of exposure to chemicals, is one of the most important public health issue of this decade.

In order to respond to this public health challenge, the WHO Regional office for Europe adopted recently a new strategy, focused primarily on the *integrated approach in chemical risk management*. This approach is based on the adopted policy and strategy of the Helsinki Ministerial Conference, where a shift is made from the traditional control of chemicals in specific media such as air, water, food etc. to more preventive mechanism of improving the "policy instruments" such as the regulations, enforcement and services, education and training, financing, public information, research, monitoring and information system, and risk assessment. Also, this strategy is following the global concept of integrated approach in sound management of chemicals (IOMC), as well as the new Public Health Policy of the European Union launched under the Amsterdam Treaty (article 152). Finally, this new strategy is focused on mobilising existing institutions, a large number of different experts, numerous non-governmental organisations, private sector and EH professionals in Europe.

Chemical production and use

The global consumption of industrially produced chemicals increased rapidly over the last few decades. Out of 11 million known chemicals, about 100,000 have been produced on an industrial scale and have come on the market. Currently about 1,000-2,000 new chemical entities are being introduced every year (EEA and UNEP, 1998).

Europe is the largest producer of chemicals worldwide, accounting for about one third of the world's production. If the current trends continue, there could be a growth of 30% to 50% in chemical output for most of the EU countries by 2010 as a result of increasing economic activity, including road transport and agricultural production (EEA, 1999). The production of chemicals in Western Europe has continued to grow faster than GDP during the last decade (Figure 1). Although the production in CCEE and the NIS has fallen markedly since 1989, with the exception of some countries where it has partially recovered in recent years, the net result is that the flow of chemicals throughout Europe has significantly increased (EEA, 1999).

The pesticides represent one of the most widely used categories of industrially produced chemicals. Pesticides can be classified in many different ways e.g. according to the use, the target pest, the chemical property of the compound used, the environmental fate (persisted and non-persisted), or the degree or type of health hazard involved. The use of pesticides can be classified in the following main categories:

- ***Agriculture:*** herbicides, fungicides, insecticides
- ***Public health:*** insecticides, rodenticides
- ***Industrial use:*** timber treatment, fungicides, insecticides
- ***Public areas:*** amenity areas, railways, roads, local parks
- ***Household use:*** herbicides, fungicides, insecticides, rodenticides

The number of old pesticides belong to the group of persistent organic pollutants (POPs) (Table 1). The use of pesticide in Europe, measured by mass of active ingredient, appears to have been decreasing in most West European

[1] The views expressed in this paper are those of the author and do not necessarily represent the decision or the stated policy of the World Health Organization

countries over the past two decades, with a slight increase for the last two years (EEA 1999). This can be explained by the decreasing range of use of new compounds, the appearance of new pesticides on the market, which are active at considerably lower concentrations, and particularly the introduction of novel compounds such as gels etc. However, the consumption of these substances does not follow a uniform trend in all countries, being a function of different agricultural practices and legislation concerning certain pesticides.

Health impact assessment

A continuous stream of scientific papers on the potential hazard of chemicals to human health has been published in open literature over the last decades. In addition to the WHO/IPCS health risks assessments for more than 200 chemicals (EHC documents), WHO/EURO made numerous efforts during recent years to assess the exposure to chemicals of European population and related health impact (WHO 1995, 1996, 1999). All that, together, represents good scientific evidence for the health impact assessment of exposure to chemicals, and a solid base for the development of policy recommendations. The text below represents a short summary of health impact assessment of exposure to chemicals, health effects of pesticides, new emerging issues, and gaps and uncertainties related to the knowledge.

Health effects attributed to exposure to chemicals

The current knowledge on causative factors and the chemical pollutants that may contribute to human health impacts, including the knowledge on sensitive groups, is summarised in Table 2 (WHO 1995, 1999). Pollutants that can affect reproductive health and progeny include metals, solvents, pesticides and PCB, DDT, and other substances, which can pass the placenta and be excreted in breast milk. These substances can influence mental and physical development, and growth of total foetus and infant. The neuro-toxicological effects are a growing concern, and there is epidemiological evidence from CCEE and NIS that children needing special education and those with mental retardation are more numerous in polluted areas than rural areas. The chemical pollution has been implicated for an increase in respiratory diseases and allergies in Europe over the past few decades, especially asthma, bronchitis, emphysema and rhinitis. Increased incidence of testicular cancer and breast cancer, as well as a decrease of the quality of men's sperm has been observed in several countries. The causes of these trends are largely unknown, but changes in the environment as well as in lifestyle may be responsible. Low levels of exposure to chemicals, may suppress the immune response defences of the body, leaving people more susceptible to diseases from viruses, parasites, bacteria and tumours. Cancer in children in the USA is increasing, and a large scale study of childhood leukaemias and other cancers in the UK was found them to be associated with living close to industrial plants, particularly where fossil fuels were being used or processed.

Health effects of pesticides

The pesticides are the most common cause of acute and sub-chronic poisonings. The main reason for it is not only the amount of pesticides used in comparison to other chemicals, but its high toxicity, use of these substances mainly by non-professionals, and inappropriate storage of this highly health hazardous substances. The adverse health effects from exposure to a pesticide depends on the dose, the route of exposure, the pesticide chemical properties, as well as on the initial health status of individual. In addition to the active ingredients, most pesticides preparations include carrier substances, solvents, compounds that improve absorption, etc. These "inert ingredients" may have health effects, both acute and chronic, that are often not evaluated. Also, interaction between pesticides when two or more products are used simultaneously may cause synergism, such as in the case of exposure to lindane and heptachlor. These interactions may occur after both short- and long-term exposure, and they are not often studied. The pesticides most often implicated in illnesses are presented in the Figure 2 (AAPCC, 1996).

Organochlorine pesticides can be considered to be a specific group of POPs continuing to pose a threat to human health. Uncontrolled use and disposal of stock of obsolete pesticides is a growing environmental health problem in NIS. But also acute poisoning by pesticides, mainly accidental exposure of children and occupational exposure of agricultural workers, is still a matter of concern. In addition, epidemiological studies have shown a direct correlation between exposure to the *chloro-s-triazine herbicides* and the incidence of ovarian and breast cancer. In contrast to the 'dioxin-like' compounds and organochlorine pesticides mentioned above, limited information is available on exposure and the resulting health risk of other POPs.

New emerging issues

There is growing scientific, political and public concern about the health impact of environmental pollutants that are considered to be *endocrine disrupting chemicals (EDCs)*. There is clear evidence for effects on wildlife, but it is uncertain whether the general population is exposed to endocrine disrupters to such an extent that human reproductive

function could be adversely affected. The question is further complicated by the wide range of compounds having endocrine disrupting properties; chlorinated and non-chlorinated compounds, pesticides, some heavy metals, lubricants and weakening agents may all be regarded as EDCs. Therefore, WHO has taken the lead in the global assessment of the state-of-the-science regarding EDCs (IPCS, 2001). In contrast to the declining trend of persistent organochlorine compounds in human milk, there is evidence that levels of *brominated environmental pollutants* in human milk are increasing thus, threatening the health of breast-fed infants. This increase is thought to be caused by the use of flame retardants over the last years. Due to the fact that information on the potential health effect of these compounds is very limited (or even lacking), this is an issue of growing concern. Also, there is increasing anxiety about the potentially hazardous effects of drug residues and persistent animal pharmaceuticals, such as greater resistance to animal antibiotics that are entering the food chain (WHO, 1999).

Gaps and uncertainties

Despite the huge amount of data, many questions regarding the health threat of environmental pollution still remain unresolved. This is mainly because people are exposed to many different chemical substances and their breakdown products, via several routes (air, water food, different consumer products). In addition, there are usually large gaps, both in time and knowledge, between exposures to chemicals, observations of possible effects, and the assessment of association and causation (WHO 1995, 1996, EEA and UNEP, 1998). Lack of data availability concerning the high production volume chemicals is presented in Table 3.

Also, it has been estimated that for more than 85% of the 2,500 High Production Volume Chemicals (i.e. substances used in volumes greater than 1,000 tonnes per producer/importer per year) little or nothing is known concerning the human health effects (Allanou at all., 1999) and it is likely that the situation concerning the chemicals produced in lower volumes is even worse. Currently the chemical substances are generally tested and classified one by one, based on available data only. If available data do not allow a judgement as to whether or not a substance should be classified as dangerous, no obligation exists for producers and importers of existing substances to generate new data (i.e. the existing substances are considered to be those that are on the market before 1981, which is about 99% of all substances).

International actions

Global response

Since chemicals are in most cases a global trade commodity, it is essential to enforce the global agreements in sound management of chemicals. Proper use of pesticides is of particular importance due to the fact that we are dealing here with highly toxic substances. Also, it is a well-known fact that some of the global problems cannot be solved by a single state action, such as in the case of depletion of the ozone layer. A joint approach, such as agreed in the Montreal Protocol and its amendments, is the only way forward if we are to counteract the destruction of the ozone layer. Joint international action is of great importance given the pronounced levels of imports and exports in the chemicals and products trade, and also in view of the ubiquitous spread of certain chemicals through air, water, and the food chain. This emphasises the need for a comprehensive, cross-media approach when evaluating the environmental relevance of a substance, and illustrates the drastic effects of failure to adopt such an approach.

The very first global action to deal effectively with the hazardous chemicals was the establishment of the *International Programme on Chemical safety (IPCS)*. The IPCS was founded in 1980 as a cooperation between the UNEP, the WHO, and the ILO. The objective of the IPCS is to determine scientific foundations for assessing the risk to human health and the environment from chemicals, with the aim of strengthening national and international endeavours in the field of chemical safety. One key focus of the IPCS's work is undoubtedly the compilation and dissemination of findings concerning the risks to humans and the environment from chemicals, which may be of industrial or natural origin. To this end, numerous monographs have been prepared on substances (generally existing substances) and evaluation methods, and there have been collaboration between the nations involved in IPCS and internationally recognised experts from around the globe. Table 4 lists the main published products. To gain general international acceptance, the IPCS has always placed great value on the scientific integrity and independence of the experts involved in its work and the transparency of its procedures. Consensus can generally be reached on the overall message of reports such as EHCs or HSGs. Beginning with an inventory of all existing methods, the IPCS is currently involved in an extensive project to compare the various procedures for evaluating chemicals. The aim of this project is to promote mutual understanding and acceptance. The health assessment of exposure to pesticides and their residues, as well as recommendations for the daily intakes are developed by the J*oint Meeting on Pesticides Residues (JMPR)*. These joint FAO/WHO meetings were carried out as early as from 1960. A large number of substances were

evaluated, and monographs published. These JMPR recommendations were incorporated into the Codex Alimentarius standards as legally binding political agreements. From 1980 the JMPR is the part of the IPCS secretariat.

Another key international player in the field of chemical safety is the OECD. Together, the 29 OECD member states cover some 78% of global chemical production. Over the past 20 years the OECD has demonstrated great commitment to chemical safety, from the point of view of securing economic growth whilst embracing environmental protection considerations (Table 5). In 1971 the OECD set up a chemicals programme specifically for this purpose, which underwent a major expansion in 1978 (Environmental Health and Safety Programme, EHS). The objectives are to protect humans and the environment from chemicals, to render chemical policy transparent, and to avoid trade barriers. Its activities encompass new chemicals, pesticides, pharmaceutical products, and existing substances. The OECD has emerged as a central coordinator in the preparation of "substance reports" (Hildebrandt and Schlottmann, 1998).

The Rio Conference provided another impetus for further development of international collaboration in chemical safety. Agenda 21, as a work programme for the 21st century, which was signed by more than 170 states in Rio de Janeiro in 1992 at the United Nations Conference on Environment and Development, detailed mandates on the "environmentally sound handling of toxic chemicals" (chapter 19). Key cornerstones include the intensification of international cooperation and the coordination of on-going international and regional activities. In the course of implementing this programme, the *Intergovernmental Forum on Chemical Safety (IFCS)* was founded at the International Conference on Chemical Safety in Stockholm in 1994, with the main tasks to control and harmonise the procedure for implementing Chapter 19 of the Agenda 21. It is to draw up recommendations for governments as well as international and intergovernmental organisations. Six key issues were identified at the conference, and a plan of action with concrete activities along with a timetable was drawn up for each (Hildebrandt and Schlottmann, 1998).

In 1995, the UN organisations UNEP, WHO, ILO, Food and Agriculture Organisation (FAO), United Nations Industrial Development Organisation (UNIDO), and OECD established the *Inter-Organisation Programme for the Sound Management of Chemicals (IOMC)* as a mechanism for coordinating the activities in Chapter 19 of Agenda 21. The foundations for this were created at the first meeting of the IFCS in Stockholm. It was joined by the United Nations Institute for Training and Research (UNITAR) in 1997. To help cut costs, the IOMC is integrated into the WHO infrastructure and is therefore based in Geneva. The Inter-Organisation Coordinating Committee (IOCC) assumes a steering function within the IOMC. Summaries of the individual programmes and dates of the various meetings on key issues are available from the IOMC (Hildebrandt and Schlottmann, 1998).

Integrated approach in chemical risk management - Europe's approach to the public health challenge

Environmental health process in Europe

Europe responded to these Global initiatives with launching the environmental health process. Under the leadership of WHO Regional Office for Europe, the environmental health conferences were organised with participation of ministers of health and of the environment, starting with the First Conference in Frankfurt, in 1989 (WHO, 1989), and continued with the Second Conference in Helsinki, in 1994 (WHO, 1994), and the Third Conference in London, in 1999 (WHO, 1999).

The Second Ministerial Conference in Helsinki, which was organised jointly with the European Commission, adopted the *Environmental Health Action Plan for Europe* (WHO, 1994), and ministers decided that each of the countries will develop the National Environmental Health Action Plan. The Conference established the *European Environmental Health Committee* with the role to harmonise and coordinate environmental health actions by intergovernmental organisations, NGOs and international organisations. Also, the Conference postulated the most important principles to be enforced for effective actions in solving the environmental health problems, such as:

- since the international institutions, organisations and programmes can do very little without concrete actions by the countries, the traditional "top-down" decision making process should be replaced by the bottom up actions by countries themselves, where the intergovernmental organisations will have only "supporting" role according to the "subsidiarity" principles.
- a shift should be made from the traditional approach in controlling the "exposure media", such as air, water, food, soil, etc. to a more preventive mechanism of improving the "policy instruments" such as the regulations, enforcement and services, education and training, financing, public information, research, monitoring and information system, and risk assessment. This new integrative approach is presented in Figure 3. It is essential to point out that the entire preventive and control system will not work if all policy instruments are not in place.
- a partnership between different actors in ensuring the sound management of chemicals, such as between the environment, health and different economic sectors such as transport, industry, agriculture, energy, tourism etc. Also, this partnership assumes close collaboration between the IGOs and NGOs, as well as with the private sector.

The London Ministerial Conference (WHO, 1999) reconfirmed those principles and further emphasised the importance of partnership between different actors in dealing with the multi-sectoral environmental health issues.

Integrated system in chemical safety

In line with the abovementioned principles, and in order to improve the chemical safety as a major public health challenge of this decade in Europe, the WHO Regional office for Europe adopted recently a new strategy, focused primarily on *integrated approach in chemical risk management*. As indicated above " (see Figure 3), this approach is based on the shift from the traditional control of chemicals in specific exposure media such as air, water, food etc. to a more preventive mechanism of improving the policy instruments, such as the following:

Regulatory instruments - The implementation of Global norms in European Region, which are available as different WHO guidelines for exposure limits for chemicals in air, water, food and occupational environment should be incorporated in the national standards. Close collaboration between the WHO and European Commission in development of different EU directives on exposure limits is an effective instrument in improving the national legislation in EU Member States, as well as in the accession countries to EU (Table 6). Also, a clearinghouse on the national legislation and regulations in chemical safety for exchange of experience between the countries will be established, with a close link with the OECD programme on guidance on chemicals legislation.

Enforcement system (chemical safety services) - Most of the European countries are without integrated system of prevention and control of exposure to hazardous chemicals as a part of the public health service, and the enforcement system in chemical safety is mostly fractionated through many "vertical" and non-coordinated control systems. Therefore, establishing the database on National Profiles of Chemical Safety Services will be the first step in this endeavour, and this programme will be developed in close collaboration with the IPCS/UNITAR project on capacity building in chemical safety (IPCS and UNITAR, 1998). This should form a basis for the development of chemical safety action plans at country level, involving all sectors concerned with this subject.

Education and training - Since the abovementioned integrated approach in management of hazardous chemicals as a public health programme is lacking in most of the European countries, most of the European countries are without any policy and coherent strategy for education and training in chemical safety. It is essential to carry out a survey of current practice, and then to develop based on the adopted integrated policy for chemical safety, the recommendations for education and training.

Monitoring systems and exposure assessments - most of the European countries are faced with the problem of defining the appropriate environmental health indicators to be used for effective monitoring and assessment of exposure to hazardous chemicals. The monitoring of chemicals in the environment is therefore under review in many countries, with the objective to reduce the unnecessary measurements, and to introduce more sense into the monitoring and information system. An effort will be made to develop countries capacities to monitor total exposures to priority chemicals of concern, and creation of databases hosted by individual WHO/Collaborating Centres on effects and exposure data for particular priority chemicals. WHO will continue the ongoing study on dioxins and PCBs, with the expansion on other POPs, and in close collaboration with the European Commission DG/RES programme. As a part of the Chemical Safety programme, the joint WHO-UNECE Task Force on Health Aspects of Long-Range Transboundary Air Pollution was recently initiated for the health impact assessment of heavy metals and POPs.

Risk assessment - Risk assessment is still a relatively new discipline in most of the European countries, and therefore, the introduction of different IPCS methodological guidelines and recommendations into the European practice will be one of main priorities (IPCS, 2000).

Research - As indicated earlier, the threat posed to general population by many of hazardous chemicals remains uncertain because of lack of knowledge about the exposures and possible impact on human health. Therefore, vigorous efforts to reduce the health risk of exposure to chemicals, is one of the most important issues for public health in the next decade. In this respect a special effort will be made to increase research in the area of epidemiology and toxicology as a part of the collaboration with the European Commission DG/RES.

Public information and risk communication - Public information and risk communication is one of the key problems in most of the European countries. Therefore, improvement of risk communication strategy for chemical safety will be one of the main priorities, taking into account ongoing WHO activities (FOS/Codex, TF on Env. Health Risks), and those of other international organisations, primarily OECD.

Early warning system - An effective programme will be developed as a part of the ongoing Programmes and projects (European Commission early warning system, WHO early warning system), to develop a strategy for recognition of emerging chemical safety problems, and for initiating adequate and timely response.

Chemical Accident Preparedness programme - As a part of the ongoing WHO/OECD programme, an effort will be made to upgrade the existing and to introduce new emergency response centres, taking into account and making use of the network of poison information centres of HQ.

Upgrading chemical safety capacity in countries in transition

With the transition to the market economy, many countries of Eastern Europe were faced with the serious economic crisis and dissolvement of legal end enforcement system. The public health system, which was responsible

for the chemical safety, was one of the first victims of economic hardship. The recovery is very slow, and it is clear that only in the Accession countries to EU some positive developments are taking place, although in most of the cases the public health sector is disengaged. The situation in Newly Independent States is becoming very critical concerning the chemical safety, and today even the persistent organic pesticides are re-introduced in the market. The assistance programmes should be urgently introduced in order to strengthen the national chemical safety programmes. The assistance should be focused on the capacity building in upgrading the legislation, services, monitoring and assessment system, and public information.

New partnership in chemical safety

As indicated above, the problems of exposures to hazardous chemicals cannot be resolved by the public health sector alone, and partnership with all other actors is essential for an effective chemical risk management. Europe has a large number of institutions of excellence and experts that should be mobilised in a concerted action to increase the knowledge of exposure to chemicals and their toxic actions, and to provide a basis for development of sound policies. In this respect special collaborative arrangements can be established with those "institutions of excellence" such as for example to be nominated the WHO Collaborating Centres.

The partnership with the relevant non-governmental organisations can bring a new impetus in promoting the chemicals safety and mobilising the public, politicians and local communities. The recent gathering of environment and consumers NGOs in Copenhagen, mobilised a large number of politicians and institutions, and produced the Copenhagen Chemicals Charter (Table 7) that will have significant promotional impact in Europe.

Also, an effort should be made to develop a close partnership with the economic sectors, and in particular with those that are of direct relevance to chemical safety, such as the chemical industry, agriculture, etc. The main objective will be to mobilise and/or re-channel the resources in direction of preventive actions, including the research and technological development that will reduce the gap in existing knowledge. This strategy is in line with the global concept of integrated approach in sound management of chemicals promoted by the Intergovernmental Forum on Chemical Safety (IFCS), and Inter-Organisation Programme for the Sound Management of Chemicals (IOMC).

Finally, promotion of this new strategy for integrated approach to sound management of chemicals will be carried out through many scientific or other specialised conferences, or through an input to the relevant ministerial conferences at the Regional level such as the "Environment for Europe" conference in Kiev 2003, and 4th Environment and Health Conference, in Budapest 2004.

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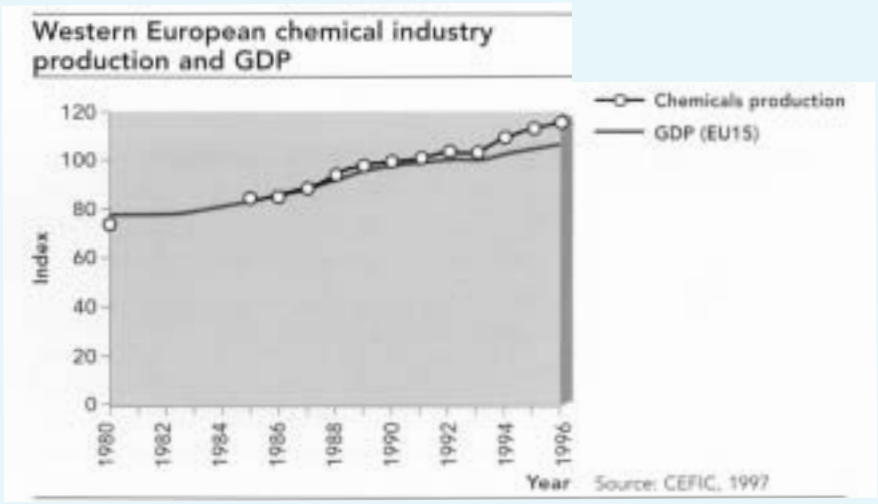
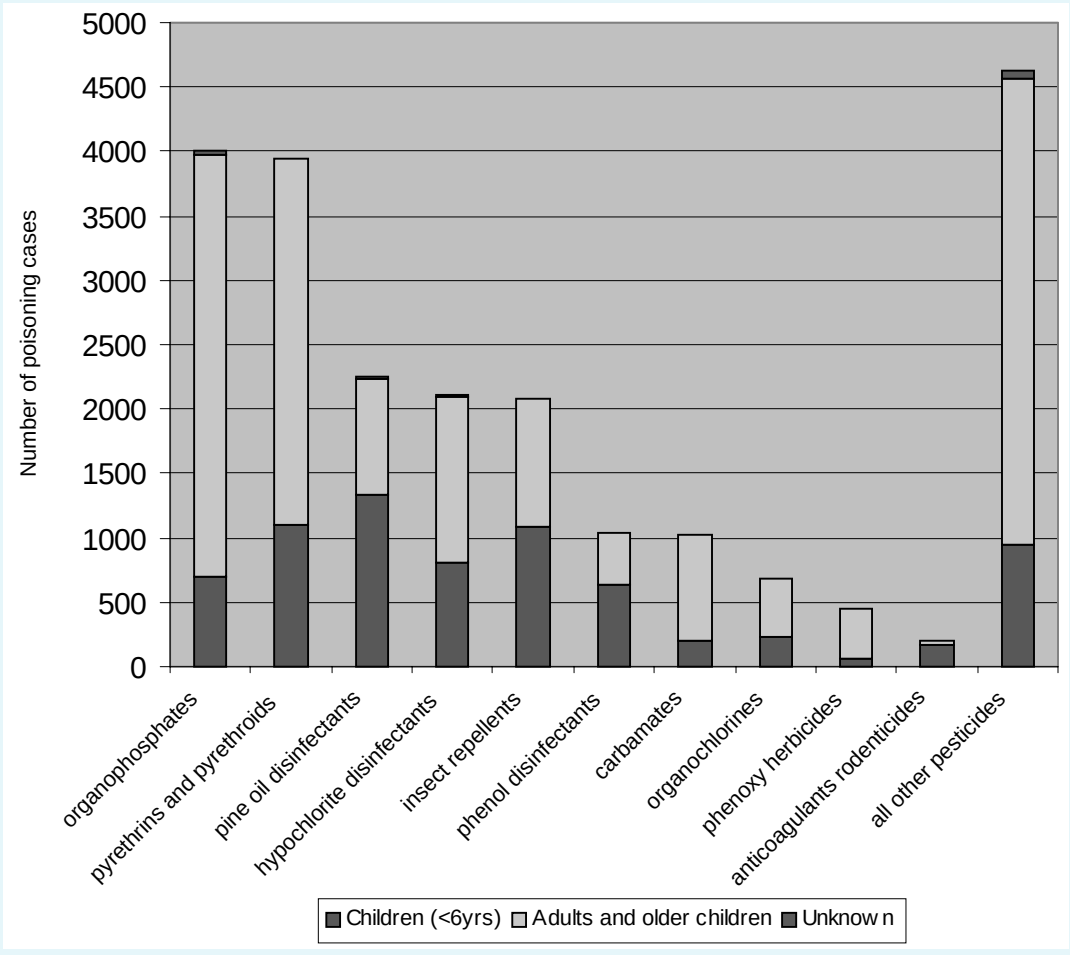


Figure 1. Western European chemical industry production and GDP



Note: intentional cases have been excluded. Pyrethrins and pyrethroids: rough estimate (includes some veterinary products not classified by chemical type).
Source: American Association of Poison Control Centres, Toxic Exposure Surveillance System, 1996 data.

Figure 2. Pesticides most often implicated in symptomatic illnesses in USA in 1996

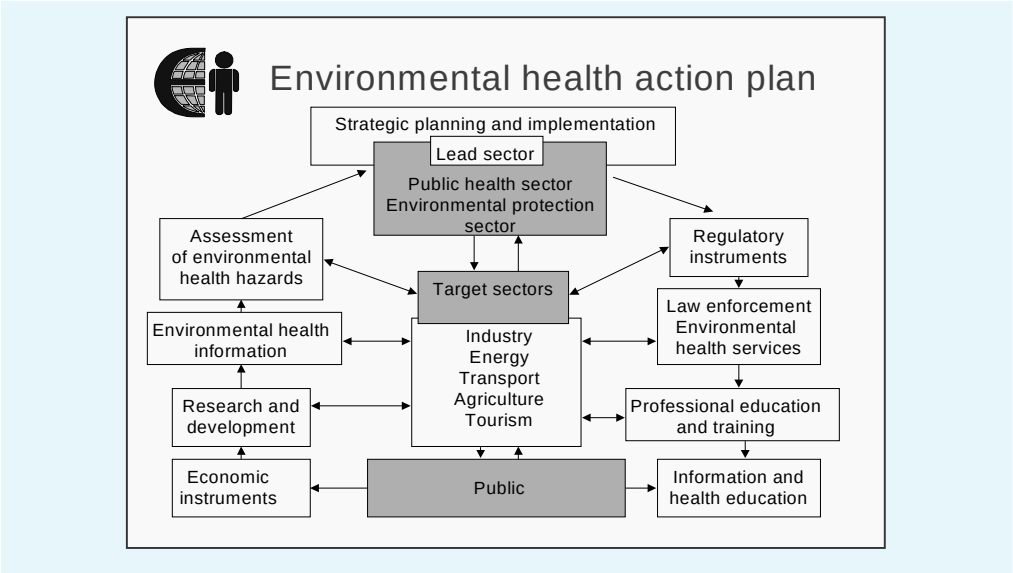


Figure 3. Integrated approach in environmental health management - improving the policy instruments

Table 1. Some persistent organic pollutants

Acronym	Compound	Applications
PAH	Polycyclic Aromatic Hydrocarbons	In crude oil – from incomplete combustion of fuel and wood – creosote wood preservative – coal tar
PAC	Polycyclic Aromatic Compounds	Heterocyclic aromatic compounds, derivatives of PAH (such as nitro-, chloro- and bromo-PAH)
HAC	Halogenated Aliphatic Compound	Volatile halogenated solvents such as tri- and tetrachloroethylene and EDC-tar
CP	Chlorinated paraffins	C10 - C30 alkanes with 30-70% chlorine
PCB	Polychlorinated Biphenyls	More than 200 subs., isolating fluid in transformators, cables, plasticisers, oil additives, paint additives, self-copying paper, hydraulic fluids
PBB	Polybrominated Biphenyls Diphenylethers	Take out intermediates for chemical industry. Brominated flame retardants.
PCN	(Poly)Chlorinated Naphthalenes	Isolating fluids in capacitors, flame retardants, oil additives, wood preservatives, pesticides, unwanted combustion products
PCDE	Polychlorinated Diphenyl Ethers	By-products of PCP, PCB substitutes, pesticide additive
PCS	Polychlorinated Styrenes	By-products of chemical processes
PCT	Polychlorinated Terphenyls	Substitutes for PCB
ACB	Alkylated ChloroBiphenyls	Substitutes for PCB
PCP	Pentachlorophenol	Fungicides, bactericides, wood preservatives
	Chloroguaiacols	By-products of chemical processes
PCDD/F	Polychlorinated dibenzo-p-dioxins/dibenzofurans	More than 200 subs., by-products in various chemical processes, impurities in PCB oil, and in herbicides, incinerators, paper pulp bleaching.
PAE	Phthalatic Acid Esters (phthalates)	Plasticisers in polymer (PVC), paint additives, varnishes, cosmetics, lubricants
	Organo-metallic compounds	Mainly mercury, lead and tin, mercury in paints, seed disinfectants, antisliming agents, lead in petrol, tin in antifouling agents on ships
DDT	4, 4-dichloro-diphenyl-trichlorethane	Insecticide still used in tropical developing countries
DDE	4, 4'Dichlorodiphenyl dichloroethene	Degradation product of DDT
HCH	Hexachlorocyclohexane	Insecticide. Several persistent isomers, from 1%-90% in lindane (gamma isomer)
Cyclodienes	Aldrin, endrin, dieldrin, endosulfan, chlordane, heptachlor	Pesticides
PCC	Polychlorinated camphenes	Pesticides e.g.: toxaphene, camphechlor
NPN	Nonylphenol	Stable degradation intermediate of nonylphenolethoxylate (NPEO) in detergents

Table 2. Health impact attributed to chemicals

Health effect	Sensitive group	Main chemicals/pollutants
Cancer	especially elderly, and children (leukaemia)	Asbestos, PAH, nitro-PAH Benzene, some metals, radon, natural toxins, endocrine disrupters
Cardiovascular diseases	especially elderly	carbon monoxide, arsenic, lead, cadmium, arsenic, cobalt
Respiratory diseases	children, asthmatics	inhalable particles, sulphur dioxide, nitrogen dioxide, ozone, hydrocarbons, solvents, terpenes
Allergies and hypersensitivities	children	particles, ozone, nickel, chromium
Reproduction	foetus, young	PCB, DIDT, phthalates, lead, mercury
Nervous system Disorders	foetus, children	methyl mercury, lead, manganese, aluminium, organic solvents
Osteoporosis	elderly	lead, cadmium, aluminium, selenium
Chemical sensitivity	30-40?, females?	solvents?, pesticides?, medication?

Table 3. Availability of data on 2 472 HPV chemicals submitted to the ECB, 1996

Properties and toxicities	Data availability
Physical chemical properties	30-60%
Acute oral toxicity	70%
Acute dermal toxicity	45%
Acute inhalation toxicity	30%
Chronic toxicity	55%
Carcinogenicity	10%
Genotoxicity/mutagenicity	62%
In vivo genotoxicity	32%
Fertility	20%
Teratogenicity	30%

Source:C.J.vanLeeuwen et al. 1996

Table 4. Main products published by IPCS

• Substance reports (Environmental Health Criteria, EHC)
These reports are designed for scientific experts and contain the latest findings on health hazards and risks for a given substance or group of substances. More recent EHCs also contain details of impact on the environment. There are currently some 190 EHCs.
• Safety guidance documents (Health and Safety Guides, HSG)
HSGs contain details of toxicity in a language, which is also accessible to non-experts as well as information on usage, handling, storage, and first-aid treatment. They are aimed at decision makers in industry and administration. Some 100 HSGs have been published to date.
• Safety data sheets (International Chemical Safety Cards, ICSC)
These contain essential data on individual products and information about health protection and safe handling, tailored to the use of the product (e.g. in factories or agriculture). There are currently some 1000 chemical safety cards at the UN level, which have also been translated into German by the BgVV.
• Poisons monographs (Poisons Information Monographs, PIM)
These contain a brief description of the principal chemical, physical and toxicological properties of each substance, and advice on the diagnosis and treatment of poisoning victims. PIMs are designed for poisons information centres and other advice agencies.
• "Concise International Chemical Assessment Documents" (CICAD)
These contain data on the potential hazard of a given substance, dosage/effect ratios, and risk characterisations based on sample exposure data. CICADs are generally based on pre-existing substance reports. These national or regional substance reports are to be updated within the context of the IPCS; in other words, any studies published since the report was drawn up are to be included. The first six CICADs (over 1,2-dichloroethane, 3,3-dichlorobenzidine, 1,1,2,2-tetrachloroethane, methyl methacrylate, limonene, and o-toluidine) are scheduled for publication in early 1998.

Table 5. Activities of the OECD, Paris, in chemical OECD safety (with 29 states).

Principal focuses of work: international harmonisation of measures to identify and prevent risks from chemicals.
• Mutual acceptance of data
• Test methods for chemicals and pesticides
• GLP for pharmaceuticals, chemicals, and pesticides
• Processing of existing chemicals
• Evaluation of substances, with the work to be shared between member states
• Proposed measures for selected substances
• Risk identification and minimisation
• Chemical accidents
• Biotechnology
Working groups:
• Chemical test methods
• GLP
• Existing substances
• Risk evaluation
• Plant-protection agents
• Harmonisation of classification
Organisation of the work:
• Plenum (joint meeting) every nine months
• Combined session with the pesticides group
• Steering committee

Table 6. Important EU Directives and tools in chemicals control

Council Directive 76/769 on Marketing and Use Regulation
Council Directive 67/548 on classification and Labelling etc. (and as amended by 79/831 and 92/32, the 6th and 7th amendments)
Commission Decision 81/437 on EINECS - Existing Chemical Registration
EU/DG XI/IPS, September 1992 on Informal Priority Setting
Council Directive 75/464 on Dangerous substances in the Aquatic Environment
Council regulation 793/93 and commission Regulation 1488/94 on Risk Assessment of Existing chemicals
Commission Directive 91/414 on Pesticides
Commission Directive 93/67 on Risk Assessment of New Chemicals
Technical Guidance documents, 16 April 1996 on Risk Assessment of New and Existing Chemicals

Table 7. Copenhagen Chemicals Charter - The 5 key demands for a better EU chemicals policy

1. A full right to know - including what chemicals are present in products
2. A deadline by which all chemicals on the market must have had their safety independently assessed. All uses of a chemical should be approved and should be demonstrated to be safe beyond reasonable doubt
3. A phase out of persistent or bioaccumulative chemicals
4. A requirement to substitute less safe chemicals with safer alternatives
5. A commitment to stop all releases to the environment of hazardous substances by 2020