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A liveable environment for our children

**Report by Germany on Implementation of the WHO "Children's
Environment and Health Action Plan for Europe" (CEHAPE)**



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Editors

Secretariat of the Action Programme Environment and Health at the Federal Environment Agency:
Christiane Bunge
Kerstin Gebuhr
Katja Kailer
Dr. Hedi Schreiber

Federal Ministry of Health:
Simone Strecker
Dr. Ute Winkler

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety:
Dr. Gudrun Lücke-Brunk

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p. 29: Kerstin Gebuhr, Federal Environment Agency

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Foreword

“Every individual is entitled to an environment conducive to the highest attainable level of health and well-being”. This sentence from the Charter of the First WHO European Conference on “Environment and Health”, of the Ministers for the Environment and Health of the European States in Frankfurt/Main in 1989 is still valid when shaping policy in the field of environment-related health protection in Germany. The German federal government has participated as a pacemaker in this process. For the first time both environment and health were linked in a holistic approach in the search for sustainable solutions of the problems. Since the beginning of the process much has been achieved. At the 2004 WHO Ministerial Conference in Budapest, the Children’s Environment and Health Action Plan for Europe (CEHAPE) was adopted placing the focus on children. Children are our future, they will form our society of tomorrow. Therefore, the protection of children is an important task for a sustainable development.

In June 2007 for the first time an intergovernmental conference will be held as a midterm review in the sequence of WHO Ministerial Conferences with the aim of considering progress in the implementation of the Budapest Conference decisions, especially as regards the Children’s Action Plan and paving the way to the next WHO Ministerial Conference “Environment and Health” in Rome, 2009.

The German federal government has taken up the decisions of the WHO European Conferences and implemented them. Already in 1999, the German Action Programme Environment and Health (“Aktionsprogramm Umwelt und Gesundheit, APUG”) was presented. The protection of children is one focal point of the Programme.

How far does the implementation of such a plan focussing on children affect the individual, a liveable environment and a health-promoting lifestyle? What can the government do to reduce environment-related health risks within the country and to participate in solving the problems internationally? What can each indi-

vidual do to create a basis for most favourable health conditions especially for children?

Today, such questions are more important than ever before. Health is our most precious property and it is our common task to preserve it. Being responsible for future generations we have to protect our natural resources as a basis for our lives. Our health is greatly influenced by our lifestyles and environmental conditions. Public opinion polls show that people are worrying about their environment although environmental burdens are declining in many fields. In the 1980ies and 1990ies in Germany emission of, e.g., classical air pollutants like particles, nitrogen oxides and sulphur dioxide could be reduced decisively. However, we have to continue with our work, draw the conclusions from the activities carried out in recent years, assess the results of our work and adjust existing programmes, especially for the protection of children and other sensitive parts of the population. Further urgent problems come to the focus of attention, as e.g. exposure to fine particles.

Health aspects have always been playing a very important role when considering environment-related political topics and we are glad to have been able to set in motion such a process of improving health for children and simultaneously also for adults. At the same time – as today’s life is hectic – other health burdens gather importance such as noise, lack of movement and unbalanced food consumption. The interdependence between environmental factors, lifestyle and health is complex and is not always easy to understand.

This is a task for policy-makers. One of the aims is to recognise future risk factors in advance in order to act and react properly and timely, if possible to take precautionary measures. We need reliable data on the current health situation and environmental conditions which may positively or negatively interfere with human health. What we need is not only a sound scientific assessment of environment-related health risks. Moreover, knowledge about the link between environment and health should

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more and more become general. Thus, it can influence decision taking of each individual but also of policy and science and economy as well.

Assessing the state of implementation of CEHAPE one must not disregard the fact that situation differs from country to country. Problems in the WHO region of Europe are manifold and therefore demand different activities adapted to the respective national conditions.

Since the WHO Ministerial Conferences many initiatives have been started to reach our targets step by step. This report gives an overview of the results achieved so far. It makes clear that environment and health are two sides of the same coin. They profit from a close cooperation between the ministries, federal, state and

environmental agencies as well as representatives of societal groups. We are convinced that sustainable action together with prevention measures and promotion of health will make an enormous contribution to cope with the challenges.

Ulla Schmidt

Federal Minister of Health

Sigmar Gabriel

Federal Minister for the Environment, Nature Conservation and Nuclear Safety



1. Introduction

1.1 Protection of health and the environment – a fruitful partnership

Human health can be affected by environmental as well as lifestyle factors. That is why the protection of health has long been an important objective of environmental policy in Germany. The international initiative on environment and health of the WHO European Region has increased awareness of the relationship between environment and health. Joint objectives were specified in the European Charter on Environment and Health at the first Ministerial Conference in Frankfurt am Main in 1989. Germany hosted this conference and also set the pace for the policy-making process. Two policy sectors – the environment and health – were linked in a holistic approach for the first time, and a search began for ways to work together to find solutions. Behind all this was the idea that a “healthy” environment, in other words one that is as intact and unpolluted as possible, is an important requirement for human health.

Great progress has been made in Germany since that time, and overall the level of protection for health and for the environment is high. German environmental policies are international forerunners in many areas, often with above-average performance. For example, Germany’s drinking water is known for its constantly high level of quality, and Germany’s sewage management is known for being techni-

cally very advanced in the retention of environmental pollutants. The German federal government also wants to continue its leadership role and expand its activities in the area of climate protection.

However, some types of environmental pollution still cannot be disregarded today. Increasing vehicular traffic – with its noise, its emissions and the risk of accidents – contributes to the impairment of health. Other individual risks are attributable to lifestyle, such as smoking and the associated exposure of the population to second-hand smoke, as well as a lack of physical activity. New problem areas that are just as urgent, such as particulate matter and noise from leisure activities, are also attracting attention.

Against that background, in June 2004 Germany made an international commitment to increase emphasis on children and adolescents in environmental and health policy. The occasion was the WHO Fourth Ministerial Conference on Environment and Health in Budapest in 2004. The conference made children and adolescents the focus of political measures to be taken throughout Europe, and adopted a Children’s Environment and Health Action Plan for Europe (CEHAPE). The common objective is

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to fulfil society's special responsibility to children and adolescents and promote the concepts of sustainability and orientation to the future. This policy approach is supported by an initiative of the European Commission, which submitted "SCALE", the European Strategy for Environment and Health¹, in June 2003 to reduce the burden of disease caused by environmental factors in Europe. To implement the "SCALE strategy", the Commission developed the European Environment & Health Action Plan 2004 - 2010, which was presented at the Fourth Ministerial Conference on Environment and Health of the WHO European Region in Budapest, Hungary in June 2004.

The German federal government is also taking up the challenges set forth in CEHAPE. Activities by the federal government are supplemented by many initiatives in the German states (Länder) and at the level of the local authorities, which are responsible for many aspects of environment-related health protection.

This report includes examples of selected measures and activities that the German federal government, the German states, and the local authorities have developed and implemented to improve the protection of children and adolescents against environment-related health risks in Germany. It describes the current situation, developments and trends, and raises new perspectives: What has already been achieved and where should the German federal government concentrate its activities in coming years?

This report is oriented to the regional priority goals of CEHAPE, which were adopted by the Member States of the WHO European Region in Budapest in June 2004. Following an introductory section that describes the specific situation of children and adolescents, section 2 traces the joint path towards future-oriented environmental and health protection in Germany.

Sections 3 to 6 of this report cover the implementation of regional priority goals I to IV of CEHAPE. What is being done in Germany to keep drinking water clean and ensure secure waste water treatment and disposal (CEHAPE regional priority goal I, section 3)? What progress has Germany made in preventing accidents and promoting physical activity among children and adolescents (CEHAPE regional priority goal II, section 4)? How successful are the measures and activities that have been implemented in Germany to improve air quality

(CEHAPE regional priority goal III, section 5)? How can diseases caused by chemicals, physical agents, biological agents and hazardous working conditions be prevented? What has been achieved in Germany so far (CEHAPE regional priority goal IV, section 6)?

Each section ends with a description of how Germany – based on successful measures in the past – will continue to improve the environment and the health of children and adolescents in the coming years.

1.2 From the idea of CEHAPE to implementation

► The WHO Children's Environment and Health Action Plan for Europe: a health-promoting environment for our children

The WHO Children's Environment and Health Action Plan for Europe (CEHAPE) was adopted at the Fourth Ministerial Conference on Environment and Health in Budapest, Hungary, in June 2004 with the participation of Ministers and Representatives of Member States – including Germany – in the European Region of the World Health Organisation (WHO) who are responsible for health and the environment. The emphasis of the political measures to be taken was deliberately placed on children and adolescents as a target group, in order to reinforce the concept of sustainability and orientation to the future. In CEHAPE, the Member States in the WHO European Region made a commitment to take coordinated, ongoing measures to protect children's health. Aspects of primary prevention, health promotion, precautionary measures, equity, and poverty reduction are emphasized. CEHAPE includes four priority goals to be implemented nationally:

Priority goal I: Water

To prevent and significantly reduce 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 adequate sanitation for all children.

Priority goal II: Accidents and injuries

To prevent and substantially reduce health consequences from accidents and injuries and pursue a decrease in morbidity from a lack of adequate physical activity, by promoting safe, secure and supportive human settlements for all children.

Priority goal III: Air quality

To prevent and reduce e.g. respiratory diseases and lower the frequency of asthma attacks by reducing outdoor and indoor air pollution.

Priority goal IV: Chemicals and physical agents

To reduce the risk of disease and disability arising from exposure to hazardous chemicals, physical (e.g. noise) and biological agents and to hazardous working environments during pregnancy, childhood and adolescence; to reduce the proportion of children with birth defects, mental retardation and developmental disorders and to decrease the incidence of melanoma and non-melanoma skin cancer in later life and other childhood cancers.

CEHAPE's priority goals will primarily be implemented through the political system at the European level and at the level of the German federal government and the German states (Länder). The success of this approach is shown in Germany, for example, by the good quality of drinking water, reliable sewage disposal, good air quality, improved protection against radiation, and a drastic reduction in traffic deaths. The German federal government has also taken measures to increase chemical safety and to reduce fine particulates in the air and the noise burden of the population in the future. These activities will contribute to further improvements in protecting the public against environment-related health risks.

The work done by autonomous government departments will be complemented by the Action Programme Environment and Health ("Aktionsprogramm Umwelt und Gesundheit, APUG"), which is initiating additional activities to reduce environmental effects on health, thereby also contributing to implementation of CEHAPE.

► Action Programme Environment and Health: Environmental protection and health belong together

In 1999, the German federal government presented the Action Programme Environment and Health at the WHO Third Ministerial Conference on Environment and Health in London. APUG is a multi-ministry initiative by the Federal Ministry of Health, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Federal Ministry of Food, Agriculture and Consumer Protection, with major technical support from the Federal Office for Radiation Protection, the Federal Institute for Risk Assessment, the Robert Koch Institute, and the Federal Environment Agency.

The objective of APUG is to recognize environment-related risks to health, evaluate them based on facts, provide information about them, and contribute to the development of appropriate risk reduction strategies. The possibilities of early risk detection and the improvement of risk assessment have been explored, and guidelines for communication on risk have been developed for the agencies. APUG aims at answering interdisciplinary questions about risk management, finding solutions, commissioning research projects to fill in gaps in knowledge, and informing the public about the relationship between environment and health.

Promoting and developing a health-conscious, environmentally-aware lifestyle, among other things through healthy living and product-oriented environmental protection, is an important task and is being intensively pursued within the framework of APUG. In addition, many of the projects and activities involve recording and evaluating environmental risks to health in different spheres of life.

Following an interim evaluation of APUG in 2002², greater emphasis was placed on APUG activities related to protecting the health of children and young people against harmful environmental effects. For example, direct information for chil-



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dren concerning the environment and health has been improved and now includes a website for children, a children's summit meeting, participation in events such as World Children's Day, the development of materials for schools, and information brochures for parents and school staff. APUG is also emphasizing the harmful effect on children of the noise they hear during their leisure time and is cooperating with the federal states in that area. Non-governmental organisations have received support from APUG for the creation of a network on children, the environment and health, preparation of guidelines for paediatric environmental medicine, and developing and testing advanced training programmes for the profession of "preventive care assistant". Another area of emphasis is local activities to improve the home environment, particularly for children and adolescents from socially disadvantaged families.

A complete presentation of all the activities and research and model projects conducted under APUG between 1999 and 2005 is contained in the report "Aktionsprogramm Umwelt und Gesundheit 1999 - 2005. Projekte - Aktivitäten - Ergebnisse"³.

A successful action programme requires close cooperation at the federal level among ministries with primary responsibility, as well as broad support from the states and local authorities and from society at large. For that reason, the German federal government prepared and further developed APUG in collaboration with non-governmental organisations and the German states. During implementation, APUG also benefits from the close collaboration with state health agencies (particularly the States' Working Group on Environment-Related Health Protection; "Länder-Arbeitsgruppe Umweltbezogener Gesundheitsschutz, LAUG") of the Permanent Working Group of the Highest State Health Authorities ("Arbeitsgemeinschaft der Obersten Landesgesundheitsbehörden, AOLG"). The state ministries of the environment and the local authorities are also involved. In 2002, North Rhine-Westphalia became the first German state to establish its own Action Programme Environment and Health (see 2.4). At local authority level, Munich City Council adopted an Action Programme Environment and Health in March 2003 that has now been implemented. The activities of APUG are contributing significantly to achieving the goals of CEHAPE.

1.3 A liveable environment for our children

In the everyday lives of children, lifestyles and environmental influences play a major role for health. Children and adolescents require particular protection because it is often more difficult for them to avoid environmental influences than it is for adults, and in some cases they are more sensitive to environmental pollutants. Typical behaviour patterns in small children, such as hand-to-mouth contact or crawling and playing on the floor, which can lead to increased exposure to pollutants, combined with the special characteristics of children's metabolism, also make it necessary to provide special environmental health protection for them.

The German federal government and the responsible ministries of the German states take into account the particular need to protect children in many different ways in the cross-sectional area of environmental health. Particular attention is often paid to children and adolescents when collecting data on health and in the field of risk management, i.e. when implementing strategies to reduce the risks to health from the environment, as shown by the examples below:

► The German Environment and Health Survey for Children and Adolescents

To obtain reliable information and comparable data on the incidence of diseases and behaviours that can affect the health of children and adolescents up to age 18, the German Federal Ministry of Health ("Bundesministerium für Gesundheit, BMG") and the German Federal Ministry of Education and Research ("Bundesministerium für Bildung und Forschung, BMBF") conducted a comprehensive study on the health of children and adolescents in Germany (the German National Health Survey for Children and Adolescents; "Nationaler Kinder- und Jugendgesundheitssurvey, KiGGS") from May 2003 to May 2006. Representative data from the study will help identify risks to health, pinpoint ways to avoid risks to health, diseases, and accidents, and allow reference values for the evaluation of development during childhood and adolescence to be derived. The KiGGS also included the German Environmental Survey for Children (GerES IV; "Kinder-Umwelt-Sur-

vey, KUS”), which collected representative data on pollutant levels in children and adolescents from ages 3 to 14 years. (see 1.4).

► Safety factors for sensitive groups (including children)

Particularly sensitive groups, including children, are taken into account when evaluating environment-related risks to health. Generally speaking, unless specific data are available, safety factors are included in the calculations done to set guideline or limit values for environmental media and food, in order to take individual differences sufficiently into account for the most sensitive age group.

In certain cases, additional safety factors are used for children. For instance, when the ad-hoc working group on indoor air quality at the German Federal Environment Agency (“Umweltbundesamt, UBA”) derives guideline values for specific substances that are present in indoor air, it applies an additional safety factor of 2 for children due to their particular respiratory characteristics. In radiation protection, both age-specific physical characteristics and habits of children are taken into account.

When necessary, the German Human Biomonitoring (HBM) Commission at the Federal Environment Agency derives special reference and HBM values for children, adolescents, and women to guarantee that targets for protection are met. A systematic distinction is made by age and sex in the new recommendations for exposure factors, in order to allow the special characteristics of the exposure conditions for specific groups to be reflected in the estimates.

1.4 Initial situation – current data

The health of children in Germany has changed considerably over the past 20 years. Acute diseases, such as those caused by infection, are becoming less important. In contrast, chronic diseases are increasing. They are often caused and influenced by multiple factors. For example, the incidence of asthma and allergies in children continues to rise. Studies show that pollutant levels may be a contributing factor. Obesity, postural deformities and cardiovascular diseases are increasing among children.

Changes in lifestyle, particularly a lack of exercise are among the causes (see 4.3).

However, major progress has also been made in Germany in some areas over the past few years. For example, the number of young women who smoke has decreased considerably in recent years (see 5.4). There has also been a 90 % reduction in child mortality from traffic accidents since 1970 (see 4.2).

► The German Health Survey for Children and Adolescents

How healthy are children in Germany? Are certain diseases more frequent in individual age groups or among boys or girls? What is the role of socio-economic status and specific environmental factors? These questions are the focus of KiGGS, the German Health Survey for Children and Adolescents (see 1.3), which was conducted by the Robert Koch Institute (“Robert Koch-Institut, RKI”) from May 2003 to May 2006. The objective was for the first time to obtain representative nationwide information on health and healthcare of children and adolescents from 0 to 17 years.

Representative population studies like the KiGGS are an important cornerstone of environmental and health policies. They allow the German federal government to correctly assess the current level of health, threats to health, and changing needs in the healthcare sector and to respond promptly to problems.

KiGGS devotes particular attention to factors that could threaten the health and development of children and adolescents or that represent risks to health in their later life. The data were collected from 167 randomly chosen locations all over Germany. The conclusions provide a starting point for targeted interventions and prevention strategies.

Medical testing on a total of 17,641 children and adolescents included visual faculty, blood pressure, thyroid gland size, endurance, coordination, and blood and urine samples. Information was also compiled on illnesses, accidents, pain, and health-related behaviour. Subgroups of KiGGS participants also underwent additional examinations on mental health (“Bella” module with 2,863 participants), motor fitness (“Mo-Mo” module with 4,529 participants), and expo-

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sure to environmental pollutants ("Environmental Survey for Children" module with 1,790 participants). This survey, which is unique in Europe, will provide a comprehensive picture of the health of children and adolescents of all ages for the first time. First results have been available since September 2006. More results of the evaluation were published in May 2007. The data will be made available to experts as a public use file in October 2008.

First results of the German Health Survey for Children and Adolescents

Overweight and obesity

Overweight and obesity are a growing health problem among children and adolescents in Germany. A total of 15 % of children and adolescents from 3 to 17 years are overweight, and 6.3 % are obese. Overweight and obesity occur more frequently in children with low socio-economic status, children with a background of migration, children who were not breastfed,

and children whose parents are also overweight (see 4.3).

Allergic diseases

Allergic diseases are among the most common health problems of children and adolescents. According to the conclusions of KiGGS, 16.7 % of all children and adolescents in Germany currently suffer from allergies, more of them boys (18.0 %) than girls (15.4 %). Allergic diseases become more frequent with age. Children with migration background are less affected than those without such a background (13.0 % vs. 17.6 %), and children from deprived families (13.0 %) have a lower incidence of allergies than children from the middle class (17.8 %) and upper class (18.9 %) (see figure 1).

Physical activity

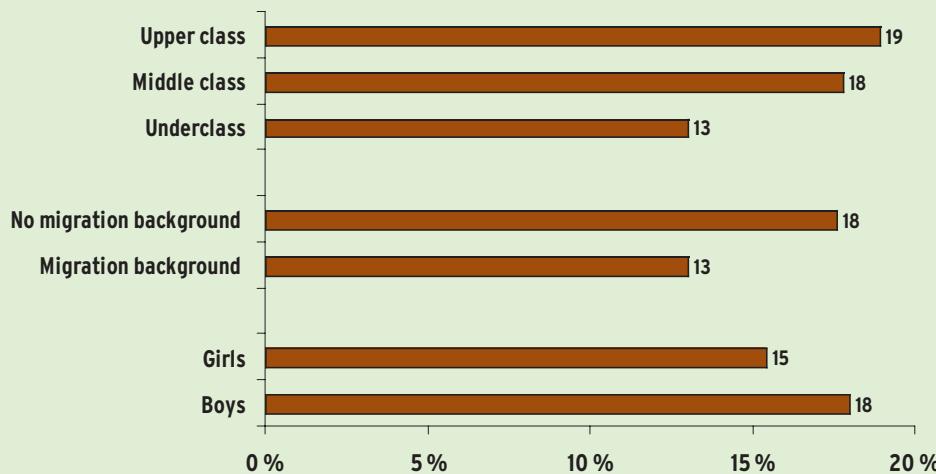
Exercise is an important health resource and during childhood (and in later life) a protective factor against obesity, cardiovascular diseases, and diabetes. Primary school children today get far less exercise than children of the same age in the past. The conclusions of the KiGGS motor fitness module indicate motor deficits in children and adolescents. For example, strength as measured by the standing long jump has decreased considerably over the past few years (see 4.3).

Accidents

Accidents and the resulting injuries are the most common reason for hospitalisation of children and adolescents and by far the major cause of death in that age group. According to the KiGGS data, 59.2 % of the affected children had accidents at home or during leisure or sports activities, 24.7 % while in care or at school, and 11.4 % on public roadways (see 4.2).



Figure 1: Percentage of children and adolescents affected by an allergic condition according to sex, migration background, and socio-economic level in Germany from 2003 to 2006



Source: RKI 2006: German Health Survey for Children and Adolescents (2003 - 2006)

► The German Environmental Survey for Children (GerES IV)

In addition to the health surveys by the Robert Koch Institute, the Federal Environment Agency conducted the German Environmental Survey for Children (GerES IV) on a randomly selected subsample from KiGGS. Exposure to chemical pollutants, moulds, and noise was examined in this subsample of 1,790 children aged between 3 and 14 years. This involved the analysis of blood, urine, indoor air, house dust, and drinking water samples, measurement of noise levels, a screening audiology, and questionnaires.

GerES IV is the first study to provide representative data on the exposure of children and adolescents from ages 3 to 14 years to environmental pollutants for environment-based health observation and reporting at the national level. The study fills gaps concerning the effects on children's health of environmental pollution. GerES IV provides data that can be used to supplement or revise national reference values that describe the background body burden of children or to update existing reference values. GerES IV is a forerunner for international data collection.

First results of the German Environmental Survey for Children

Exposure to lead, mercury, polycyclic aromatic hydrocarbons (PAHs) and pentachlorophenol (PCP) has decreased markedly since 1990/92⁴, demonstrating the success of environmental and health policy measures. A comparison with exposure data from other countries in Europe and the rest of the world shows that nowhere – apart from Sweden – do children have such low lead levels as in Germany (see 6.2).

In contrast, children's exposure to environmental tobacco smoke has not decreased. Half of all children still live in a household with at least one smoker. Cotinine levels in urine indicate that exposure to environmental tobacco smoke has even increased. Moreover, the future EU limit value for benzene in ambient air is exceeded in almost half of the households where children live and someone smokes each day.

The link between environmental conditions and health was also examined by GerES IV. In the hearing test, around 13.0 % of the children aged 8 to 14 years showed a loss of more than 20.0 dB(A) and 2.4 % a loss of more than 30.0 dB(A) in at least one of the frequencies measured. Noise from leisure activities can be one of the causes of this hearing impairment (see 6.4).

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¹SCALE: *Science – Children – Awareness – Legal Instruments – Evaluation*

²*Status report "Umwelt und Gesundheit gestalten: 3 Jahre Aktionsprogramm – Bilanz und Perspektiven 1999 - 2002: Statusbericht" and documentation from the symposium on 5 and 6 June 2002.*

³*Federal Environment Agency et al. (Publisher) (2005): APUG Report 1999 - 2005: Action Programme Environment and Health. Projects – Activities – Results.*

⁴*The Federal Environment Agency investigated both adults and children from ages 6 to 14 years in an environmental survey conducted between 1990 and 1992. By comparing the data from that study with the current conclusions, the Agency is now able to evaluate the trend for the exposure of children to environmental agents.*

Additional information:

Action Programme Environment and Health (APUG): <http://www.apug.de>

Action Programme Environment and Health North Rhine-Westphalia (APUG NRW): <http://www.apug.nrw.de>

Federal Environment Agency (UBA): <http://www.umweltbundesamt.de>

Federal Institute for Risk Assessment (BfR): <http://www.bfr.bund.de>

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU): <http://www.bmu.de>

Federal Ministry of Food, Agriculture and Consumer Protection (BMELV): <http://www.bmelv.de>

Federal Ministry of Health (BMG): <http://www.bmg.bund.de>

Federal Office for Radiation Protection (BfS): <http://www.bfs.de>

German Environmental Survey for Children (GerES IV):

<http://www.umweltbundesamt.de/survey/us03/uprog.htm>

German Health Survey for Children and Adolescents (KiGGS): <http://www.kiggs.de>

Robert Koch Institute (RKI): <http://www.rki.de>

WHO Fourth Ministerial Conference on Environment and Health, Budapest in 2004:

<http://www.euro.who.int/budapest2004>

WHO Regional Office for Europe: <http://www.euro.who.int>



2. Together on the path to improved environmental health

2.1 Introduction

Environmental conditions that are compatible with health are a prerequisite for the life of future generations. Sustainable health and environmental policies that will ensure our grandchildren's future are a task for several ministries, and joint efforts by everyone responsible and by various societal groups will be required.

More than one quarter of the German population feels that their health is strongly impacted by environmental problems. Institutions and participants from the various ministries are working to reduce the risks to human health that result from environmental pollution. The different tasks that are involved in environmental protection and health care fall under the responsibility of the German federal government, the German states ("Länder"), and the local authorities. Structures and initiatives exist at the federal, state, and local levels to facilitate the close cooperation needed to implement the measures specified in CEHAPE.

The German federal government and many non-governmental organisations help children, adolescents, and adults to enhance their skills so they can improve health and develop a healthy lifestyle. The participation of non-governmental organisations in communicating and implementing the objectives of the German

federal government is important for involving relevant societal forces and having an effect on various areas of life and work.

The German federal government considers the participation of young people to be a fundamental element in society and politics. Active participation of children and adolescents in the implementation of the regional priority goals of CEHAPE is a successful instrument for advancing efforts to promote health sustainably and for helping to advance environmental health for children and adolescents. Therefore, the responsible people at the federal, state, and local levels aim at tapping the potential of young people and increasing the involvement of children and adolescents in processes to improve health and environmental conditions in many ways.

2.2 Prevention as a joint effort

The aim of prevention and health promotion is to enhance physical, mental, and social well-being and thus to improve the quality of life of the population over the long term. Prevention is becoming increasingly important as a policy area that covers multiple sectors. Prevention-

2. Together on the path

oriented activities are intended to reduce the risk of disease before harmful effects occur. The state bears the responsibility for developing plans and measures to improve the environment and health conditions in all affected sectors. The ultimate objective is to create living conditions that will promote health and motivate the citizens to adopt a health-conscious lifestyle; this applies to individual citizens and to the entities responsible for public institutions such as schools and kindergartens.

In this context, risks that could result from environmental pollution must also be kept in mind. All of us can influence environmental conditions in our own private surroundings by our own behaviour. For example, levels of indoor air pollutants can be reduced by choosing appropriate interior materials (furniture, rugs, paint, and construction products). Proper ventilation can prevent the development of mould in living spaces. Refraining from smoking in enclosed rooms and vehicles makes a major contribution to keeping air quality high and avoiding additional impacts on health. A good basis of information for citizens, businesses, and the people in charge of public organisations is needed to support independent actions to promote health. By developing labelling systems and providing information, the German federal government is helping to improve knowledge about appropriate products and behaviour that will promote health.

Local preventive efforts are important for increasing public awareness of health and the environment and improving the health skills of each individual. Preventive measures must be taken where people live. Preventive efforts must be integrated directly into people's living environments and include areas such as school, the workplace, leisure activities, and the home in order to reach the greatest possible number of people and structure their surroundings in a way that will promote health. To develop the basis for a healthy lifestyle, strategies to promote health and preventive efforts must be put into place as early as possible so that a healthy development can be induced during childhood and adolescence.

Measures in the area of the environment and health are therefore frequently addressed to the population itself – in some cases directly to children and adolescents – or to people who can have a positive influence as opinion multipliers. For example, the Action Programme En-

vironment and Health (“Aktionsprogramm Umwelt und Gesundheit, APUG”), offers special Web pages about the environment and health for children and adolescents, as well as practical brochures and campaigns to provide information about how environment-related health risks should be evaluated and tips on how to avoid such risks. Local model projects have trained children and adolescents directly on site and encouraged them to participate actively in shaping their own living environment. Guidelines for schools – such as those on indoor air quality – support efforts to establish conditions that will promote health.

The German Forum on Disease Prevention and Health Promotion (“Deutsches Forum Prävention und Gesundheitsförderung”), which includes some 70 associations and organisations with an interest in prevention and the promotion of health, has reached an agreement with the Working Party on Healthy Kindergartens and Schools (“Arbeitsgruppe Gesunde Kindergärten und Schulen”) concerning the priority issues of physical activity, diet, coping with stress, and smoking. The Forum has developed recommendations and quality standards for healthy day-care facilities and (all-day) schools based on a broad consensus and has introduced examples of good practices for promoting health in day-care facilities and schools. The Forum has also held conferences, e.g., on healthy learning in day-care facilities and schools in October 2005 (see 4.3).

In addition, the German Prevention Prize, a co-operative project of the Bertelsmann Foundation, the German Federal Ministry of Health (“Bundesministerium für Gesundheit, BMG”), and the German Federal Centre for Health Education (“Bundeszentrale für gesundheitliche Aufklärung, BZgA”), was awarded in 2004 for projects to promote health in day-care facilities and schools. The prize-winning projects were also in the areas of diet and physical activity. The objective of the German Prevention Prize is to find out about high-quality projects in the area of prevention and disseminate information about them.

To put prevention and the promotion of health in Germany on a permanent footing, a law on prevention is planned which will enhance primary preventive care and the promotion of health in the direct living environment of the population. Prevention will become an independent pillar of health care. The Prevention

Act will improve cooperation, the coordination of preventive efforts, and the quality of measures taken by social insurance funds and the social insurance sector in a way that is comprehensive and free of red tape.

2.3 Environmental and health awareness

The German federal government has been conducting studies on environmental awareness in Germany since the early 1990s. Current results of the survey from 2006 indicate that 93 % of the German population consider environmental protection to be important. When people are questioned about the most important problems in Germany, environmental protection ranks second. One third of Germans consider environmental quality in Germany to be "somewhat poor", almost twice as many as during the last survey in 2004.

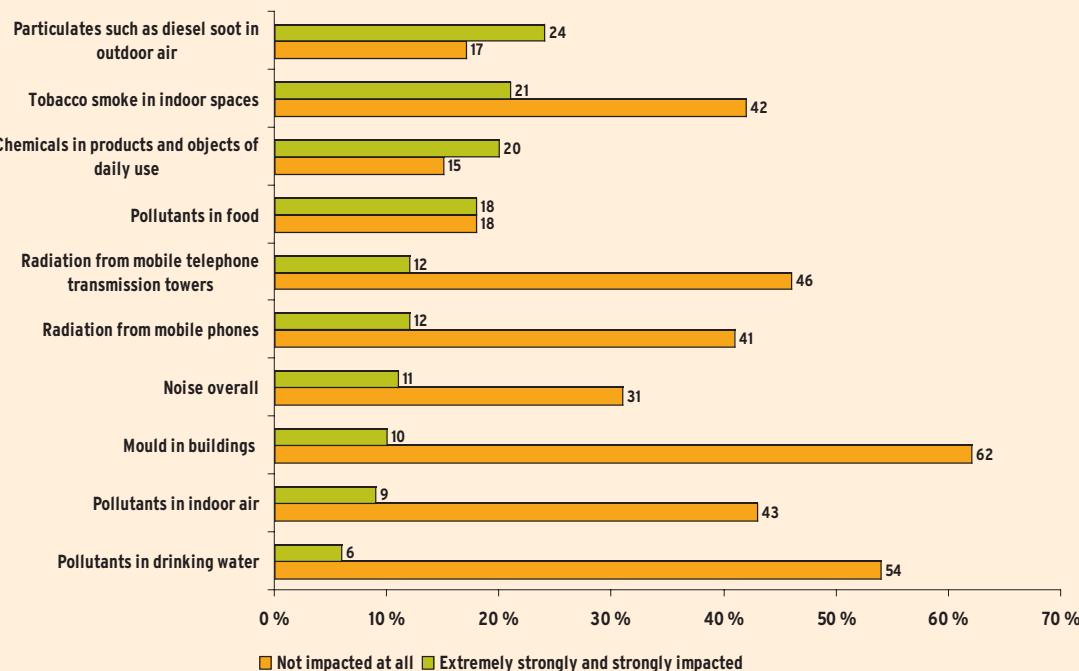
More than one quarter of the German population consider their health to be strongly impacted by environmental problems. Only 16 % of Germans feel that their health is in no way affected by environmental problems. Figure 2

shows which environmental risks are perceived to be particularly harmful.

Germans rate fine particles in the air as the pollutant posing the highest risk to health. Almost one in four respondents considers that particulates have had an extremely strong or strong impact on them. Furthermore, 59 % feel that they are impacted moderately or somewhat. A large number of respondents also perceived tobacco smoke indoors, chemicals in products and items of daily use, and contaminants in food as having strong impacts on health.

According to the survey, allergic diseases represent an increasing health problem. In 2006 19 % of respondents indicated that they are affected by an allergy, and some 21 % said that a member of their household suffers from allergies. According to the subjective assessment of the respondents, both the frequency of allergic diseases and their severity have increased. A total of 27 % of people with allergies now state that they consider their overall well-being to be very strongly or strongly impaired.

Figure 2: Perception of health impacts



Source: BMU 2006: Representative survey on environmental consciousness and environmental behaviour in 2006

2. Together on the path

2.4 Activities of the German states

Under the federal structure of the Federal Republic of Germany, important tasks involved in environmental protection and health care fall under the responsibility of the German states and are implemented at the administrative levels of the states.

Generally speaking, the adoption of federal laws and implementing legislation requires a majority vote by the German states in the German Federal Council ("Bundesrat") since German national legislation specifies that the states are responsible for implementation. However, the leeway for action can vary. Requirements under binding international agreements – for example within the framework of EU legislation on air quality, protection against noise, or monitoring of drinking water – must be strictly observed by the German states. The states have much more freedom to determine their own actions in other areas – particularly when dealing with problems related to indoor air quality; measures to promote health, reporting, and public education; and participation at the local level.

The general framework of German federal laws therefore does not require a uniform approach by the German states in every case. However, voluntary coordination among the states and a uniform approach are particularly advisable if this can avoid duplications of effort and if the problem involved is not specific to one region. Voluntary cooperation by the states is coordinated and structured in the bodies that come under specific conferences of ministers – including the Conference of Ministers of Health ("Gesundheitsministerkonferenz") and the Conference of Ministers of the Environment ("Umweltministerkonferenz") – in which the responsible ministers of the states adopt joint resolutions. The importance of these conferences of ministers is also to be seen in the fact that they prepare political comments that can be directed to the federal level, other conferences of ministers, or other participants.

The Table of Child-Specific Actions on Environment and Health under CEHAPE, which was proposed at the WHO European Conference in Budapest in June 2004, must therefore be implemented in different working structures depending on the type of action: either as part of the formal involvement of the German states through the Federal Council as specified under

German constitutional law, through voluntary cooperation between the German federal government and the states, or independently by the German states and local authorities.

► Coordination and cooperation

The implementation of the actions specified in CEHAPE will require working structures for mutual information and coordination, particularly among the Environment and Health Ministries at both the federal and state levels. The first steps towards establishing such structures were taken when creating APUG. In March 2000, the Conference of Ministers of Health created a project group to coordinate cooperation with federal institutions and to carry out projects involving several German states. Meetings of representatives of the states from the State Working Group on Environment-Related Health Protection ("Länder-Arbeitsgruppe Umweltbezogener Gesundheitsschutz, LAUG") with federal institutions were held during subsequent years. The adoption of the European Environment & Health Action Plan and of CEHAPE in Budapest in June 2004 clearly showed the need to enhance cooperation and promote greater involvement of the German state Ministries of the Environment and the responsible local authorities. For that purpose, federal-state coordination meetings were held in 2005 and 2006 with the participation of the Environment and Health Ministries at both the state and federal level, as well as local umbrella organisations. This form of extended cooperation is to be continued according to the current policy position of the Conference of Health Ministers. The development of these working structures has made a lasting improvement in interdisciplinary cooperation between the German federal government and the states and has made a substantial contribution to the further development of the area of environment and health in the Federal Republic of Germany.

► Examples of cooperation between the German federal government and the states

The action recommended in the Table of Child-Specific Actions on Environment and Health under CEHAPE regional priority goal III (Define and ensure implementation of minimum in-

door air quality requirements in schools and public buildings where children spend their time) is an example of an action that has already been implemented thanks to voluntary cooperation throughout Germany. A multi-state ad hoc working group was formed in 1989 and has been working with federal institutions since 1993 to establish guideline values for indoor air. The guideline values are used by local officials to evaluate indoor air quality in public buildings, and particular attention was devoted to children when the guideline values were developed (see 1.3). Another interdisciplinary federal-state working group has been working since 1997 on the health evaluation of construction products in connection with the EU Construction Products Directive; this work is aimed at the goal listed in the Table of Child-Specific Actions under CEHAPE regional priority goal IV (Develop and enforce regulations to minimize risks from hazardous building materials).

One example of political initiatives is the resolutions passed in July 2005 by the Conference of Ministers of Health on "preventive health care through efforts to reduce tobacco consumption" in order to make schools smoke-free. The resolution of July 2006 on the "improvement of protection for non-smokers in Germany" calls for more extensive smoking bans in public buildings, particularly in health-care facilities and day-care centres for children (see 5.4). Other initiatives of the Conference of Ministers of Health in recent years have aimed at getting the Conference of Ministers of Construction to adopt mandatory rules on minimizing indoor radon levels (see 6.3). At present, the Conference of Ministers of Health is working towards a voluntary undertaking by owners of discotheques to reduce noise levels there (see 6.4).

To ensure the rapid availability beyond individual administrations of information on air and water quality and atmospheric emissions and the condition of soil, the German federal government, states and local authorities are currently developing a German National Spatial Data Infrastructure ("Geodateninfrastruktur für Deutschland, GDI-DE"). It is part of the European INSPIRE initiative, which includes "health and safety" and "environmental monitoring".

► Independent activities of the states

In addition to national cooperation, many German states are carrying out independent projects. North Rhine-Westphalia is so far the only state to establish its own Action Programme Environment and Health ("Aktionsprogramm Umwelt und Gesundheit Nordrhein-Westfalen, APUG NRW"), which places the emphasis on regional and local implementation. APUG NRW pools tasks and initiatives in the area of environment and health, and its primary objective is to make further improvements to environment-related health protection in the state of North Rhine-Westphalia. It promotes interdisciplinary cooperation and encourages activities in the area of environment and health. Current areas of emphasis include "transport, environment, and health" and "housing and health". Projects in those subject areas primarily contribute to achieving CEHAPE regional priority goal III (prevent and reduce respiratory disease due to outdoor and indoor air pollution) and regional priority goal IV (reduce the risk of disease and disability arising from exposure to hazardous chemicals, physical agents, biological agents and to hazardous working environments). Projects that have been completed in the area of transport have helped to develop working materials to assist environmental and transport officials in doing evaluations and making decisions, thereby making it easier at the local level to plan and implement measures to reduce the adverse effects of air pollution and noise. This supports the implementation of the EU Directives on Air Quality and Environmental Noise. The combination of the areas of "transport" and "housing and health" offers ways to tie in with the EU Strategy on the Urban Environment. One area emphasized by projects that have been completed in the area of housing and health is the detection, avoidance, and reduction of pollutants in indoor air. Future projects will include the spatial and social living environments. Among other things, CEHAPE regional priority goal II is aimed at the prevention of childhood accidents. Local activities in North Rhine-Westphalia in this area are supported by APUG NRW.

The aim of all activities of APUG NRW is to improve environment-related health protection of the population. All population groups will benefit from improvements to air quality, both indoors and outdoors. Epidemiological studies done by the state of North Rhine-Westphalia not in the context of APUG NRW frequently fo-

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cused on children as a particularly sensitive group. Within the framework of APUG NRW, a network has been established to connect participants in the areas of environment, planning, transport, construction, and health. Representatives from business and academia are actively involved at the project level.

Environmental health studies in ten-year-old schoolchildren have been conducted in the German state of Baden-Württemberg since 1992 as part of the "Sentinel Public Health Offices" ("Beobachtungsgesundheitsämter") project. Children in the fourth grade of primary school underwent biomonitoring for heavy metals and chlorinated hydrocarbons in blood and urine and the frequency of respiratory diseases and allergies was determined, initially every year and then every two years until 2002 at four locations with different structures (Mannheim, Stuttgart, Kehl, and Aulendorf/Bad Waldsee). Since 2004, the project has included regular examinations at various public health departments of sensitisation to several inhalation allergens and a monitoring programme to assess the body mass index (BMI)¹ of fourth graders. The "Sentinel Public Health Offices" project has also included – and will continue to include – various individual studies on issues of environmental medicine, including biological pollutants and particulate levels in homes and schools, and the stress-based effects of environmental noise on schoolchildren.

The environment-related health condition of children starting school has been monitored since 1991 in the German state of Saxony-Anhalt. The data are used as a basis for efforts to counter negative trends that are observed and develop appropriate preventive approaches within the framework of the state's own health target process. In that context, projects have been carried out to promote physical activity (see 4.3) and prevent accidents (see 4.2) in day-care facilities and schools.

Many projects involving protection against noise have been initiated in the German states of Baden-Württemberg, Bavaria, Brandenburg, Hesse, and Schleswig-Holstein, with particular attention to the prevention of hearing loss in children and adolescents (see 6.4). Schleswig-Holstein has also established a heat wave warning system (see 5.2), a project to investigate pollutant levels in food, and a breast milk programme for the entire state (see 6.2). A measurement programme to improve indoor air

quality in schools and kindergartens has also been instituted for the entire state (see 5.3).

2.5 Actions at local authority level

Environment-related health protection must be addressed directly to the people concerned. This is the task of the German states and local authorities. There is a particular need for action at the local level concerning the development of an environment that is compatible with health, for example a healthy home environment, sufficient open and green spaces, places where children can play, or a reduction in the impact of traffic and noise. Local authorities can take advantage of their direct contacts with citizens to educate them about risks to health due to environmental influences and about how to participate actively in shaping an environment that will promote health. Activities by associations, clubs, and initiatives in the area of environmental health education, such as educational campaigns in certain districts, are also important.

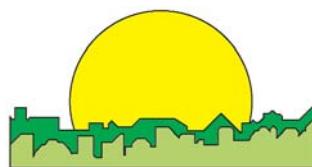
Promising instruments for environment-related health protection at local authority level in Germany are local action programmes, initiatives, and the creation of networks for involved ministries. The most important initiatives and programmes are described below.

► Healthy Cities Network

Health in the cities is becoming an increasingly important issue in the European Region and is becoming an ever more demanding task. The health of people who live in the urban environment is decisively influenced by the places where they live and work, by the characteristics of their natural and socio-economic environment, and by the quality and accessibility of the agencies that provide social welfare and health services to the public.

The German Healthy Cities Network was created in Frankfurt am Main in 1989. It is a voluntary association of some 60 local authorities in the Federal Republic of Germany. It is part of WHO's Healthy Cities movement. In Europe, over 1,000 cities and municipalities in 29 countries are now included in national and regional networks. The Healthy Cities initiative of WHO

is based on the Ottawa Charter for Health Promotion, which in 1986 declared its support for "health for all". The Healthy Cities Network is addressed to employees in public health, social welfare, housing, environmental, and town planning agencies, as well as to representatives of health initiatives and self-help groups.



The members of the Healthy Cities Network pursue an integrative approach to health policies. They try to ensure that all public planning and decisions include content and methods to promote health. The objective is to create appropriate background conditions so that all citizens can participate more actively in structuring their own living and environmental conditions. The establishment of a comprehensive health and social welfare reporting system is part of the process of making a city healthy. The project cities have implemented numerous programmes in the past on the basis of cooperation among ministries. Activities in the overlapping area of environment and health are accorded great importance.

► **Federal-state initiative "Socially Integrative City"**

The Socially Integrative City Programme was launched in 1999 to counter the increasing social and spatial fragmentation in cities. The Programme currently funds new approaches to the development of urban districts in 420 programme areas in 284 German cities and municipalities. The objectives of the Programme are to:

- Stabilize and improve physical conditions for housing and living space and the economic base in urban districts,
- Increase opportunities by improving skills, abilities, and knowledge
- Enhance the local image, openness of the district, and identification with the neighbourhood.

The Socially Integrative City Programme is oriented to channelling funds in addition to its own Programme funding, such as the financial

aid from various German federal and state ministries and local authorities, into the districts of the Socially Integrative City so that investment and non-investment projects can be carried out there. This is particularly successful thanks to the partner programmes of the Socially Integrative City, which are specifically concerned with the "funding framework" of the "Socially Integrative City".

Implementation of the Programme so far shows that it is on the right path so that effective organisational structures for district development can be established and integrated plans of action can be developed, and so that measures and projects that will add momentum can be carried out.

► **"Local Agenda 21 - Environment and Health" project**

The topic of environment and health received a major stimulus from the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 (known as the Rio Conference). Agenda 21, which was adopted at the Conference, contains a separate chapter (chapter 6 of Agenda 21) on protecting and promoting human health. Local Agenda 21 also originated at the Conference (chapter 28 of Agenda 21). Local Agenda 21 provides the prerequisites at the local level for stronger integration of skills in the area of the environment and health and for taking advantage of potential synergies at the interface of environment and health.

The results of the Local Agenda 21 – Environment and Health project, which was carried out in the framework of the APUG show the increasing importance to local administrations of the subject of environment and health. In response to a survey, almost half of the employees of local environmental and public health agencies, as well as the Local Agenda 21 coordinating offices, stated that dealing with environment and health was accorded great priority in their work.

During the project, good practices in the area of environment-related health protection were compiled and presented on an online portal. This gives decision-makers and other participants at the local level specific suggestions for networking the area of environment and

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health. The focus is on joint areas of activity – including noise abatement, improvement in the living environment, and public relations work – and opportunities for cooperation between people who are locally involved in the field of environment and health.

► Local activities under the Action Programme Environment and Health

The German federal government funded five model projects throughout Germany from 2003 to 2005 as part of the local activities under the APUG. The projects showed how housing and community conditions can be improved and individual risk prevention can be supported among the population, particularly among children. Different participants, such as local administrations, associations and initiatives, educational and research facilities, and entities responsible for providing services to children and adolescents, received support in different cities on integrating the topic of environment and health in the individual living environment and making residents aware of healthy, environmentally-conscious lifestyles. The focus was active participation of the population – particularly children and adolescents – in structuring the environment in which they live (see 2.7). Thanks to cooperation among ministries and linking up resources and the structures of what is offered, an effective local network has been established in many places to support environmental and living conditions that promote health. The model projects were based on existing networking structures such as Local Agenda 21, Healthy Cities, and Socially Integrative Cities networks and also expand on them.

A model project was funded by the city of Munich as part of the local activities under APUG. In March 2003 Munich, the capital of Bavaria, became the only city in Germany to have its City Council make a formal commitment to implementation of APUG. That paved the way for continuation of APUG in Munich after 2005 when funding of model projects ended.

2.6 Civic engagement: Participation of environmental and health organisations

As a result of cooperation among policy-makers, agencies, and non-governmental organisations, it has been possible to broaden the dialogue with members of the public concerning issues of environment-related health protection for children and adolescents in Germany and to have a more profound discussion of the most urgent problems and any opportunities for ensuring that environmental and living conditions will promote health.

For better coordination of the activities and projects of non-governmental organisations in the area of children, environment, and health, the creation of the Network for Child Health and the Environment (“Netzwerk Kindergesundheit und Umwelt”) was funded within the framework of APUG in 2001. The Network is a broad coalition of associations of medical and healthcare professionals, health initiatives, environmental associations, parents’ initiatives, and children’s and young people’s organisations. The Network merged to form the association Network for Child Health and the Environment – Alliance for Our Grandchildren’s Future (“Netzwerk Kindergesundheit und Umwelt – Bündnis für eine enkeltaugliche Zukunft”) in 2004.²

Under the sponsorship of the Ecological Physicians Society (“Ökologischer Ärztebund”), the Network for Child Health and the Environment has developed and tested a “Guideline for paediatric environmental medicine in outpatient health care” and a curriculum for advanced training as a preventive care assistant. The aim of the “Guideline for paediatric environmental medicine in outpatient health care” is to improve the training of paediatricians, particularly in the field of preventive medicine. It provides basic information and assistance in handling cases where environmentally-caused conditions are suspected in children and adolescents. Trained specialists in paediatrics practices who offer advice on prevention that is targeted to young people and parents is also a successful approach for minimizing or preventing diseases in children or adolescents that are caused or influenced by environmental factors.

In recent years the Network for Child Health and the Environment has become established as a permanent contact partner for the non-governmental organisations on issues related to

children, environment, and health. With the financial support of the German federal government, the Network will, as in the past, attend the WHO European Ministerial Conference in Vienna in June 2007 to participate in the international process to improve the environmental and living conditions of children and adolescents.

The activities of the Network are documented in a brochure on children, the environment and health ("Kind – Umwelt – Gesundheit"). The Network also has its own Internet platform to inform the public about its activities.

2.7 Participation of children and adolescents

"Don't just talk about kids, get kids actively involved" has been the motto of many initiatives and projects launched by the German federal government over the past few years. The involvement of children and adolescents – as experts about themselves – is a successful strategy in the area of environment-related health protection for children and adolescents. This applies particularly to specific projects and initiatives at the local level in which children and adolescents can directly play a part.

The German federal government has held several events and forums on child health and the environment with the active participation of children and adolescents within the framework of APUG. The youngsters were able to discuss strategies for action to improve environmental aspects that affect children's health with specialists and policy-makers and also helped to design aspects of the events.

At a "children's summit" in 2003, participating children and adolescents determined what areas related to environment and health should from their viewpoint receive greater emphasis. They adopted a "children's resolution" on a healthier, more environmentally conscious everyday life. The event showed how children can be given a voice on current political issues related to environment and health.

Active involvement by children and adolescents – particularly from socially disadvantaged families – has also been at the forefront of local activities in connection with APUG. In projects such as "environmental detective" or "planning

for real," girls and boys dealt creatively with the issue of environment and health and were able to participate in shaping the immediate environment in which they live.

At the end of 2006, the Action Programme for More Youth Involvement ("Aktionsprogramm für mehr Jugendbeteiligung") was launched. A number of federal institutions and the German Federal Youth Council ("Deutscher Bundesjugendring e.V.") are involved in this joint initiative. The Programme targets children and young people aged between 6 and about 24 – both those who are members of organisations and those who are not. The main topics and target groups included "The younger generation's value in society", "Children and adolescents from disadvantaged families", "Children and adolescents with migration background", "Demographic change" and "Intergenerational solidarity". With its motto "You can't change anything if you don't do anything," the Programme promotes a diverse range of individual modules in the form of series of projects, media workshops and events within the framework of the EU Presidency. There will also be a number of activities in connection with the elections to the European Parliament in 2009, and annual competitions for ideas aimed at children and adolescents with special needs. One of the highlights of the Action Programme for More Youth Involvement will be a festival/summer camp to be held in Berlin in 2008, with thousands of children and adolescents attending.

"Involving children and adolescents" is also one of seven key elements within the implementation of the National Action Plan 'for a child-friendly Germany 2005 – 2010' ("Nationaler Aktionsplan 'Für ein kindgerechtes Deutschland 2005 - 2010'").

¹Body mass index (BMI) = weight in kg/ height in m²

²Member groups include Arbeitsgemeinschaft Allergiekrankes Kind (AAK), Arbeitsgemeinschaft Pädiatrische Umweltmedizin in der Gesellschaft für Pädiatrische Allergologie und Umweltmedizin, Bund für Umwelt und Naturschutz Deutschland (BUND), Kinderumwelt GmbH, Deutsche Berufsverband der Umweltmediziner (dbu), Interdisziplinäre Gesellschaft für Umweltmedizin (IGUMED), Kind und Umwelt e.V., "National Coalition für die Umsetzung der UN-Kinderrechtskonvention in Deutschland", and Ökologischer Ärztebund.

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Additional information:

Action Programme Environment and Health (APUG): <http://www.apug.de>

Action Programme Environment and Health North-Rhine Westphalia (APUG NRW): <http://www.apug.nrw.de>

Conference of Ministers of Health: <http://www.gmkonline.de>

Conference of Ministers of the Environment: <http://www.umweltministerkonferenz.de>

Federal Minister for Family Affairs, Senior Citizens, Women and Youth (BMFSFJ) (Children and Adolescents): <http://www.bmfsfj.de/Politikbereiche/Kinder-und-Jugend/partizipation.html>

Federal Ministry for the Environment, Nature Conservation and Consumer Protection (BMU): <http://www.bmu.de>

Federal Ministry of Health (BMG): <http://www.bmg.bund.de>

GeoPortal.Bund: <http://geoportal.bkg.bund.de>

German Federal Youth Council: <http://www.dbjr.de>

German Forum on Prevention and Health: <http://www.forumpraevention.de>

German National Spatial Data Infrastructure: <http://www.gdi-de.de>

German Prevention Prize: <http://www.deutscher-praeventionspreis.de/>

Healthy Cities Network: <http://www.gesunde-staedte-netzwerk.de/>

Internet portal Local Agenda 21 Environment and Health: <http://www.la21-umwelt-gesundheit.de>

Munich Action Programme Environment and Health: <http://www.muenchen.de/apug>

Network for Child Health and the Environment: <http://www.netzwerk-kindergesundheit.de>

Socially Integrative City: <http://www.sozialestadt.de>

Study on environmental awareness in Germany, 2006: <http://www.umweltbundesamt.de/umweltbewusstsein>



3. CEHAPE - Regional Priority Goal I: Healthy drinking water and safe waste water management

3.1 Introduction

The availability of sufficient quantities of drinking water and safe and hygienic waste water management are important prerequisites for human health, particularly the health of children. Therefore, one of the goals of CEHAPE from June 2004 is to provide access to safe and affordable water and adequate sanitation for all children. This will prevent or significantly reduce the morbidity and mortality arising from gastrointestinal disorders and other diseases due to poor water quality and inadequate waste water management. Access to drinking water is available throughout Germany, and provision of waste water management is guaranteed nearly everywhere.

In 2004, a total of 60.05 million people in Germany (72.45 % of the population) were supplied with 4,112.52 million m³ of drinking water from centralised water supply plants with outputs of more than 1,000 m³ per year. Of the untreated water that is purified to produce drinking water in those plants, 76.2 % comes from groundwater, 13.3 % from surface water, and 10.5 % from other resources, such as bank filtrate. Due to strict statutory requirements, drinking water in Germany is of excellent quality overall.

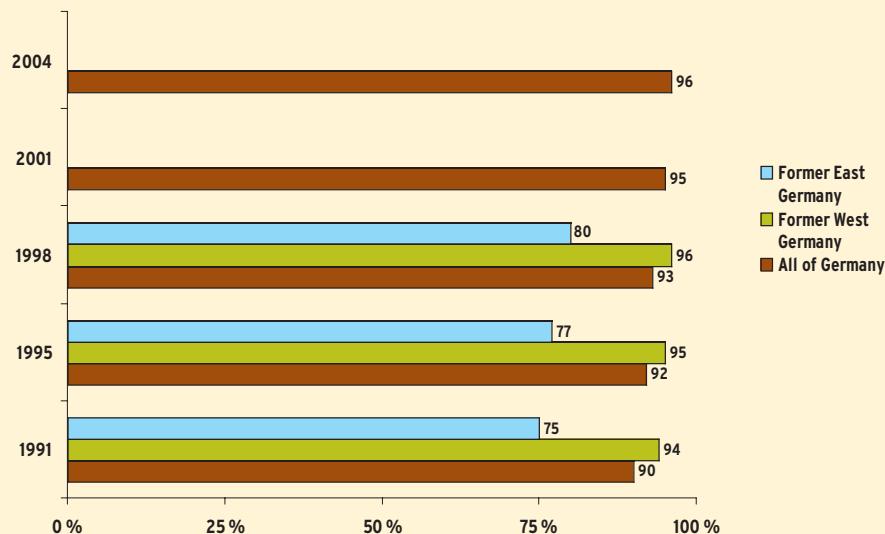
Over 96 % of the population in Germany (79 million people) are connected to the public sewer system. Some 9.4 billion m³ of waste water is treated in public treatment plants every year. Waste water management in Germany has reached a high level of technical advancement.

3.2 Drinking water quality

The basic structure of Germany's piped water supply system is over 100 years old. It is constantly being adapted to meet new technical and health requirements. One major objective of the public water supply is to provide to the public at all times sufficient quantities of drinking water that fulfils strict statutory quality requirements, at a sufficiently high pressure. "Water for human consumption" should not just be pure and good-tasting, in other words, perceived by consumers to be pleasant and appetising. Above all, it must not contain any pathogens or substances in concentrations that could be harmful to health. This is necessary because water is not only used by adults for drinking and everyday domestic needs, but is also used among other things to prepare infant formula.

3. CEHAPE-RPG I

Figure 3: Population connected to public sewers



Source: German Federal Statistical Office 2006

Consistently following the multi-barrier principle is key to continuous preservation of high drinking water quality. Its basic elements are the ongoing protection of resources, treatment that is appropriate for the quality of the source water, and avoidance of recontamination during storage and distribution and in domestic plumbing systems as a result of proper technical planning, construction, and operation in accordance with the generally-recognized state of the art.

Drinking water is distributed through a network of pipes that can change its composition to a greater or lesser degree, due among other things to the interaction with surfaces that come into contact with water, such as the materials used to make the pipes. That is why hazardous materials such as lead must not be used in the public water distribution system in Germany today. In all, quality of public water supply in Germany is high or very high.

Health or taste problems occur in many places "in the last few metres", in other words in the home plumbing system, for example due to old-fashioned lead pipes or fixtures and fittings that are not state of the art or were not properly installed ("DIY errors"). The low surface to volume ratio of pipes in buildings; frequent, sometimes prolonged stagnation of the water; and in some cases a high ambient temperature promote corrosion processes and therefore the

release of (heavy) metals into drinking water, as well as microbial growth. Legionella growth in drinking water pipes and high lead concentrations in the drinking water in old buildings are the most serious problems encountered in water distribution systems in Germany and can also be harmful to health. For example, the consumption of low doses of lead can cause headaches, fatigue, lassitude, and a loss of appetite, or it can change the haematopoietic system that produces blood cells and retard learning abilities in children.

► Measures and actions to maintain drinking water quality

In Germany the Drinking Water Ordinance of 21 May 2001 ("Trinkwasserverordnung 2001, TrinkwV 2001") protects drinking water quality and specifies how it is to be monitored. The Ordinance that entered into force on 1 January 2003 transposed into German national legislation Directive 98/83/EC on the quality of water intended for human consumption of 3 November 1998.

The German states ("Länder") are responsible for implementation of the 2001 Drinking Water Ordinance, and they report annually on compliance with the limit values and requirements contained in the Ordinance. The reports are

compiled and evaluated by the German Federal Environment Agency ("Umweltbundesamt, UBA"). The public health offices of the districts and independent towns are responsible for monitoring drinking water quality in Germany. House and apartment owners are responsible for domestic drinking water plumbing and its suitability from the viewpoints of health and technology for transporting drinking water.

In addition to statutory requirements for drinking water quality and monitoring, the appropriate professional associations prepare technical rules and regulations for all steps in the supply chain, from protection of drinking water resources to treatment, storage, and distribution, as well as drinking water pipes in buildings. The 2001 Drinking Water Ordinance refers in different places to generally-recognized rules of the art. This link between technical rules and regulations and the Ordinance ensures that proper technical practices are followed when planning, building, and operating water supply systems, thereby making a major contribution to preventive health protection.

The German Federal Ministries of Food, Agriculture and Consumer Protection, and Health and Social Security, in conjunction with the Federal Environment Agency and several professional associations, published an information brochure on lead in drinking water in 2003. The Federal Environment Agency also issues many recommendations and guidelines after hearing the testimony of the Drinking Water Commission of the German Federal Ministry of Health, for example concerning sampling for Legionella, sampling in domestic plumbing systems for microbiological testing, and sampling when testing for heavy metals.

A brochure on drinking tap water ("Trink was – Trinkwasser aus dem Hahn") published by the Federal Environment Agency in December 2005 contains information on drinking water supply pipes in buildings. It explains among other things what materials may be used in drinking water pipes, how to determine what materials are contained in an existing system, whether those materials pose a risk to health, and potential protective measures.

The German states and local authorities have also conducted – and are continuing to conduct – numerous activities on how to avoid exceeding the limit values for drinking water due to improper pipes or fittings in buildings. These

activities have concentrated on lead, copper, Legionella, reverse osmosis filters, the problem of stagnation, and the general issues of corrosion and building drinking water pipes. Different media and methods were used, such as personal advisory services offered on-site (including sampling), telephone advice lines, flyers (some of which were in foreign languages), publications in the press, and lectures. Specific information was provided for households, plumbers, DIY centres, and consumer networks. Special events such as consumer symposiums and the Long Night of Consumer Protection ("Lange Nacht des Verbraucherschutzes") were also held.

Many German states, local authorities, and water supply companies test drinking water free of charge for households that include pregnant women and young children and conduct campaigns to promote the replacement of lead pipes, which include the provision of grants. There are also agreements between public health officials and water supply companies concerning the replacement of lead water supply pipes by 2013. Generally speaking, consumers in Germany can obtain information on the quality of drinking water from the responsible public health offices and water supply companies. If there is a justified suspicion that limit values for drinking water are being exceeded, the public health office will help arrange for proper investigation of the suspected case by a listed, accredited agency.

► Outlook

Random checks have indicated that drinking water from the large water supply plants in Germany is of good to very good quality. Over 98 % of the water analyses that were done complied with the maximum allowable limits for microbiological and chemical parameters. It must be remembered that no water supply system can be prevented from exceeding limit values in every single case and that these are mostly short-term local events. The entire population in Germany is therefore generally supplied with clean, high-quality drinking water. It is particularly positive to note that the percentage of cases sampled where the limit values for the parameter nitrate were exceeded declined from 1.1 % in 1999 to 0.8 % in 2001 to 0.13 % in 2004. Limit values for the parameter lead were detected only at the taps of final consumers. This indicates that lead is still present

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in drinking water pipes in buildings or that fittings are being used that do not comply with generally recognized rules of the art. Many public campaigns over the past few years have increased public awareness of the problem of lead – and other substances that are harmful to health – in drinking water.

In spite of the generally high quality of drinking water in Germany, individual exceptions are sufficient cause to make further efforts to maintain safe drinking water supplies for the public in the future and where possible to work towards further improvements in quality.

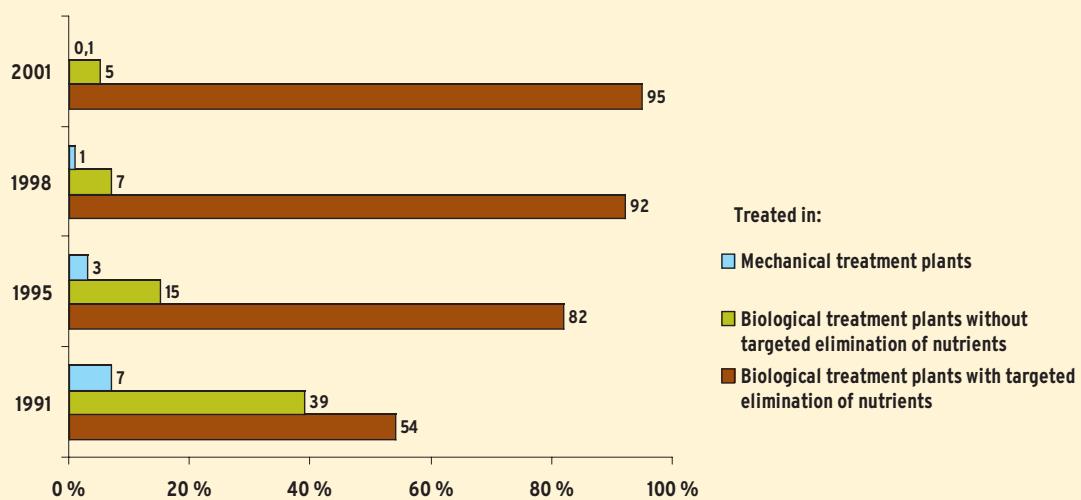
3.3 Waste water management

Every year private households and trade and industry produce over five billion cubic metres of waste water that must be treated before it is discharged into rivers and lakes. Household waste water contains high concentrations of detergents and cleaning products. Today almost 100 % of waste water is treated in modern treatment plants, about 96.5 % in biological treatment plants with removal of nutrients, and about 3.5 % in biological treatment plants without additional processing steps. Waste water management in Germany is subject to government regulation (the Federal Water Act; "Wasserhaushaltsgesetz, WHG") and state laws on water). There are almost 10,000 public waste

water treatment plants. The percentage of the population that is connected to the public sewers increased from 90 % in 1991 to 96 % in 2004.

Household and industrial discharges are generally referred to as waste water; it has been changed by being used and is discharged into a sewer. Pollutants are present in waste water in both dissolved and undissolved form. The content of waste water can be divided into oxygen consuming compounds – (such as uric acid and glucose), nutrients (such as nitrogen or phosphorous compounds), harmful substances (such as toxins, heavy metals, and synthetic organic substances), micro-organisms (bacterias, fungi, and viruses), and contraries (such as salts, fats, oils, clay, and sand). The undissolved particles in household waste water primarily come from toilet flushing (faecal matter and paper) and the kitchen (such as leftover food). These are therefore primarily organic compounds (fats, proteins, carbohydrates). Oxygen consuming compounds are biodegradable and can cause unpleasant odours during anaerobic degradation processes. The biological oxygen demand caused by these substances can also reduce the oxygen content of lakes and streams, which can result in fish die-offs, for example. Nutrients cause eutrophication, particularly in standing bodies of water, and are responsible for increased algae growth in lakes and in the sea.

Figure 4: Effluent treated in public water treatment plants



Source: German Federal Statistical Office 2003

► Measures and activities in the area of waste water management

The Federal Water Act is a framework law that provides general rules for water management activities. According to Article 7a of the Act, a permit for discharging waste water is granted only if the pollutant load of the waste water is kept as low as possible according to the state of the art. The German federal government, with the consent of the Federal Council ("Bundesrat") uses statutory ordinances to specify requirements that are in accordance to the best available techniques. To protect bodies of water from unintended contamination with pollutants, Article 19g of the Act also specifies how substances that are hazardous for water must be dealt with during transport, storage, and handling. The provisions of Article 7a of the Act establish the basis for the German Waste Water Ordinance ("Abwasserverordnung, AbwV"), with specific requirements for the discharge of waste water into waterbodies and therefore for waste water flow, waste water avoidance, and waste water treatment.

The specific statutory requirements are specified in the Waste Water Ordinance, the most recent revision of which entered into force on 1 January 2005. It contains requirements for the discharge of domestic and municipal waste water and over 50 branches of production (industries), such as the agro-food industry, the chemical industry, and the iron, steel, and metal processing industries, or textile manufacturing and processing. The Waste Water Ordinance also transposes the technical requirements of EU legislation that are related to waste water.

Public waste water management – including sewage treatment plants – in Germany is a state duty that is performed by communities and cities as a local authority responsibility. Some private industrial companies also have their own sewage treatment plants. Germany is among the countries that fulfil the requirements of the EU Directive on urban waste water treatment (Directive 91/271/EEC).

► Outlook

Compared with other countries, Germany (along with Denmark and Austria) is a leader in the area of waste water management. Modern waste water treatment plants are able to eliminate most pollutants in waste water. For example, municipal waste water treatment plants can remove some 90 % of the phosphorous and 76 % of the nitrogen by eliminating nutrients.

As a result of strict environmental legislation and many voluntary technical measures taken by industry, considerable progress has been made in recent years in treating and preventing industrial waste water. The documented improvement in the water quality of rivers, streams, and lakes in Germany is the result of those efforts.

Further development of technologies that take cross-media aspects into account will be the focus of future waste water management. The use of resources must be minimized and closed loops for materials must be created. Solutions will differ as a function of the various background conditions taking into account cross-media aspects. Decentralized technologies will also become more important.

A major discharge path for the pollution of surface waters is runoff from treatment plants as a result of rainfall, discharges from two-pipe drainage systems, and overflows of combined sewers containing rain-water and household waste water. It can be very beneficial in that regard to separate rainwater from treatment of other types of waste water.

A future challenge will be how to deal with traces of organic materials such as drugs, cosmetics, and endocrine disrupting compounds, which end up in the aquatic environment after processing in treatment plants. Little or nothing is known about the eco-toxicological potential of these pollutants, and they should if possible be kept out of surface water and prevented from moving from there into the groundwater. Drinking water is obtained from both sources in Central Europe. Conventional biological waste water treatment methods eliminate considerably more than 95 % of the organic load contained in waste water, but remove far less of the polar micropollutants or trace chemicals, such as many of the pharmaceutical products mentioned above. Combination methods involving biological, physical, and/or chemical treat-

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ment methods may be much better at eliminating these pollutants.

Based on the results of a nationwide testing programme, the 61st Conference of Ministers of the Environment in November 2003 adopted a resolution specifying among other things that in future pharmaceuticals must be taken into account to a much greater extent in the testing programmes of the German states and federal government for environmental monitoring. The state of North Rhine-Westphalia held an interdisciplinary symposium last year on minimizing discharges of pharmaceuticals into bodies of water that are used to produce drinking water. A flyer has been published to inform the public about environmentally-compatible disposal of unused pharmaceuticals.

In addition, increased attention must be devoted to ensuring – particularly in the interest of protecting children – that bodies of water that

are used for bathing are free of harmful micro-organisms such as viruses, bacteria, or parasites. Purified waste water contains 10 to 100 million germs per litre. Any requirements for bathing water are contained in the requirements for sanitation from the Bathing Water Directive (“Badegewässerrichtlinie”). Technical solutions for reducing germ counts, such as membrane technology, already exist.

However, membrane filter systems are just one way to protect bathing waters under hygiene aspects. Other systems have been used successfully for decades now to keep waste water out of bathing waters, such as the “ring sewer” system that was used for the first time around the lake Tegernsee in Bavaria, or UV disinfection of waste water.

Additional information:

Bathing Water Directive: <http://www.bmu.de/gewaesserschutz/downloads/doc/36874.php>

Conference of Ministers of the Environment: <http://www.umweltministerkonferenz.de>

Drinking Water Ordinance: http://bundesrecht.juris.de/trinkwv_2001

Federal Environmental Agency (UBA): <http://www.umweltbundesamt.de>

Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) (protection of water): <http://www.bmu.de/gewaesserschutz>

Federal Ministry of Health (BMG): <http://www.bmg.bund.de>

Water Act: <http://bundesrecht.juris.de/whg/index.html>

4. CEHAPE - Regional Priority Goal II: Accident prevention and promoting physical activity

4.1 Introduction

Society as a whole is responsible for the safety of children and adolescents. Accident prevention is therefore an important duty for everyone in society. Accidents involving children can be prevented, or at least their severity can be reduced, by designing an environment that takes children into account, taking technical safety measures, and carrying out monitoring and supervision, as well as through education and training. More comprehensive public campaigns and more effective measures to improve traffic safety are needed to promote the safest possible environment.

An environment in which children feel safe and can move about freely is not only an important prerequisite for preventing accidents, but also stimulates physical activity and allows youngsters to develop a healthy, active lifestyle.

A lack of physical activity, in contrast, is a major risk factor for overweight in children and adolescents. Overweight and obesity, which are primarily caused by a lack of physical activity and an imbalanced diet that is too high in calories, are also a growing health problem for children and adolescents in Germany. Overweight over a prolonged period can lead to secondary conditions such as high blood pressure, diabetes, and joint problems.

In addition to regular physical activity, the greatest potential for prevention lies in a balanced diet, which promotes healthy development of children and adolescents.

Accident prevention and the promotion of physical activity are important elements for reducing and preventing childhood diseases. Priority goal II of WHO's Children's Environment and Health Action Plan for Europe (CEHAPE) is aimed at preventing and substantially reducing health consequences from accidents and injuries and pursuing a decrease in morbidity from a lack of adequate physical activity, by promoting safe, secure and supportive homes and environments for all children.

4.2 Accident prevention

Starting with the first year of life, accidents are the greatest health risk for children and adolescents. They are the most frequent cause of death in children between their first and fifteenth year of life. Experts say that about 60 % of the accidents suffered by children and adolescents are avoidable.

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Germany has already achieved a great deal in the area of accident prevention for children and adolescents. That is shown, for example, by the trend for children killed in traffic accidents. The number of children killed in road traffic has decreased by more than 90 % since 1970. That is due among other things to numerous statutory requirements, technical improvements, and educational campaigns conducted by public institutions in cooperation with many groups and initiatives of civil society.

► Data on the prevalence of accidents in children and adolescents

The available data on accidents in children and adolescents in Germany provide information about the current incidence of accidents, as well as about trends over time. Based on these data, participants at the federal, state, and local levels can develop and successfully implement specific accident prevention measures.

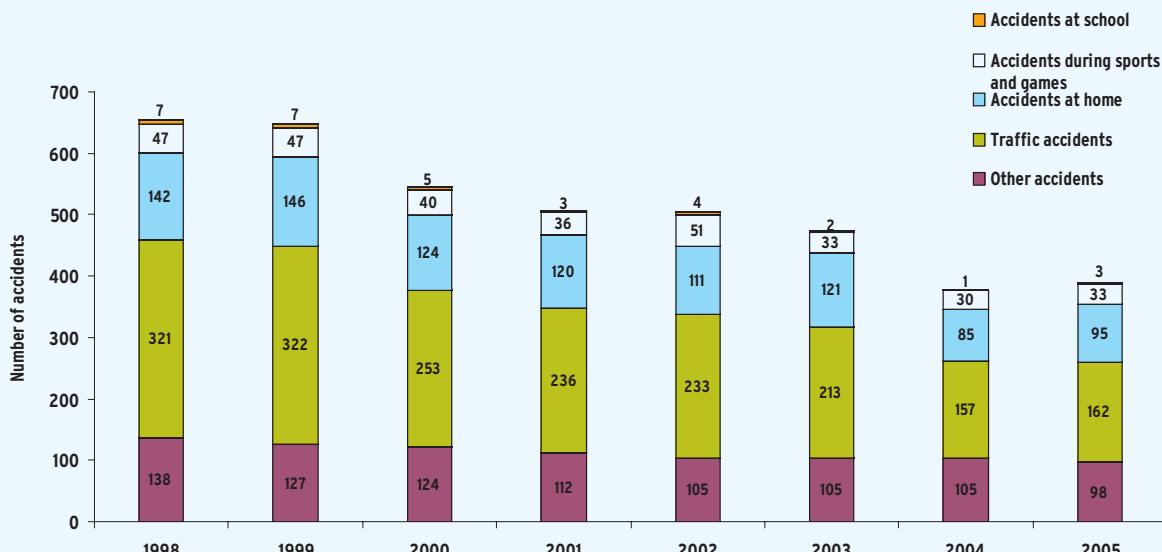
In 2005, a total of 391 children in Germany died as the result of an accident or a severe injury. 41 % of those children were killed in traffic accidents, 24 % in household accidents, and 8 % in accidents during sports activities or while at play. Three children died in an acci-

dent at school in 2005. Breaking down this data by age shows that the risk of dying in an accident at home is greatest from ages 0 to 5 years, while the most frequent cause of death among 10- to 15-year-olds is traffic accidents.

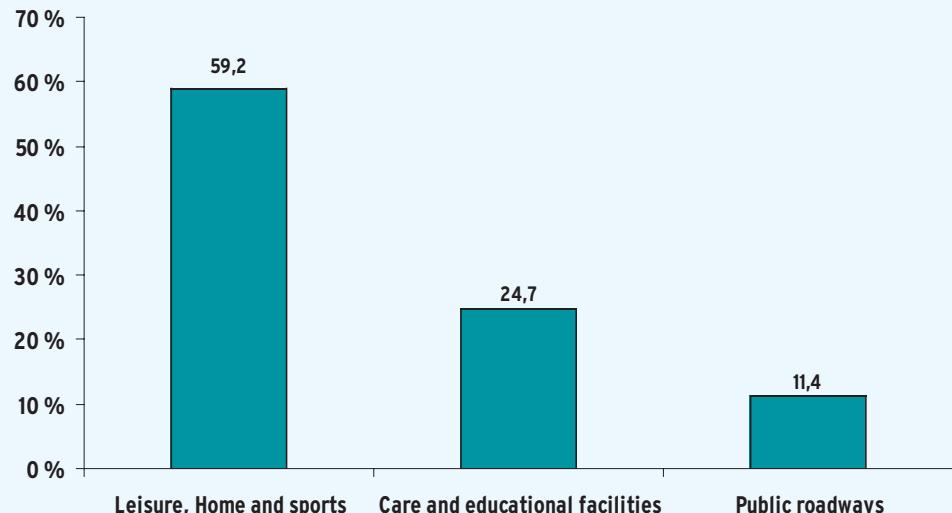
An analysis of the accident data from 1998 through 2005 shows a downward trend for all types of accidents. This is particularly evident for traffic accidents, where 50 % fewer children died (see figure 5).

Data on children injured as a result of accidents is available from statistics on accidents among schoolchildren and statistics on traffic accidents. Current data on the incidence of accidents that do not only relate to school or traffic accidents among children and adolescents in Germany are provided by the German Health Survey for Children and Adolescents (2003 - 2006; "Nationaler Kinder- und Jugendgesundheitssurvey, KiGGS") of the Robert Koch Institute ("Robert-Koch-Institut, RKI") (see 1.3). The KiGGS data include injuries requiring medical treatment and provide information about the place where the accident occurred, the accident mechanisms, and the resulting injuries. Figure 6 below shows where children and adolescents in Germany most frequently had accidents.

Figure 5: Mortality in children ages 0 to 15 years due to accidents in Germany from 1998 to 2004



Source: GBE-Bund

Figure 6: Percentage of injuries as a result of accidents by type in Germany from 2003 to 2006

Source: RKI 2006: German Health Survey for Children and Adolescents (2003 - 2006)

As children and adolescents get older, the occurrence of accidents shifts from home to leisure, home and sports activities, as well as to accidents in educational institutions and on the road.

Falls, at 60.5 %, are the most frequent causes of accidents. That is followed by around one fifth (20.4 %) of injuries due to collisions or impacts with objects or people. The main injuries that result are contusions, dislocations, and strains.

Accidents at home and during leisure time

Accidents at home and during leisure time, according to the KiGGS data (2003 - 2006), account for over half of accidents among children and adolescents (see figure 6). Most childhood accidents at home or during free time occur when playing, running around or playing sports. This is because when children play they do not recognize hazards, they overestimate their own abilities, or they do not pay attention. Many accidents are attributable to defective products and an unsafe environment and, in the case of younger children, inattention by the people caring for them.

Accidents in day-care facilities, schools, and universities

According to KiGGS, about one quarter of all accidents involving children and adolescents occur in care and educational facilities (see figure 6). The Central Federation of Public Sector Accident Insurers ("Bundesverband der Unfallkassen e.V., BUK"), has compiled epidemiological data for Germany on the incidence of accidents and injuries among schoolchildren since 1971 in a register that was created on the basis of the statutory accident insurance scheme for schoolchildren. It currently includes 17.4 million children, adolescents, and young adults and includes incidents at day-care facilities, general education and vocational schools, polytechnics, and universities, as well as on the way to and from those places and at home. The main cause of serious accidents and particularly fatalities is traffic accidents on the way to school in rural areas. Injuries that require medical treatment are primarily caused by accidents while playing sports.

Traffic accidents

Children are subject to a high risk of accidents related to road traffic, and they are actually at

greatest risk of a fatal accident as a passenger in a car. When children have accidents while riding bicycles or walking, the accidents are frequently caused by the child's behaviour. The world of road traffic is an adult's world in which the other participants in traffic often misunderstand children's spontaneity, age-related limitations to perception, and behaviour.

A total of 6,274 children¹ under age 15 were severely injured by traffic accidents in 2005. Of the 159 children in fatal accidents, 67 were riding in cars, 42 were pedestrians, 41 were on bicycles, and 9 were using other means of transport.

The number of children who were passengers in cars when they had an accident² declined by about 28 % from 1991 (16,583) to 2005 (12,006). The number of children who died in cars dropped by almost two-thirds during the same period. In 2005, 67 children under 15 died from traffic accidents while they were passengers in cars, compared with 196 children in 1991. The number of children severely injured in cars has decreased by about 60 % since 1991, from 3,438 to 1,350 children.

This trend is due among other things to increased use of restraint systems in passenger cars. In 1992 only around 70 % of children fastened their seatbelts while riding in cars, but the rate had risen to 97 % by 2005.

► Measures and activities to prevent accidents among children and adolescents

To pool research and activities in Germany related to the prevention of childhood accidents, particularly accidents at home and during leisure time, a federal working party on child safety ("Bundesarbeitsgemeinschaft Kindersicherheit") was formed in 1997 on the initiative of the German Federal Ministry of Health ("Bundesministerium für Gesundheit, BMG"). Its successful work is now being continued by Safe Kids Germany ("Bundesarbeitsgemeinschaft Mehr Sicherheit für Kinder e.V.") formed in 2002, which is continuing to support prevention of childhood accidents in Germany.

Safe Kids Germany is the umbrella organisation for the prevention of childhood accidents and the platform for cooperation by institutions

that are active or interested in the field of childhood accidents. One important task is networking and providing an opportunity for everyone involved in the process to exchange their experiences. Public awareness of the issue of preventing childhood accidents is to be increased, while raising the consciousness of parents and children. Child Safety Day is held on 10 June every year and is an appropriate forum for this.

The German Federal Centre for Health Education ("Bundeszentrale für gesundheitliche Aufklärung, BZgA"), in a cooperative project with Safe Kids Germany, has assembled a database on the prevention of childhood accidents in Germany, which is available on the Internet. It provides a structured overview of the institutions that are active in the area of preventing childhood accidents in Germany, so it is an important platform for information and networking. The Federal Centre for Health Education has also published an educational brochure for parents on how to prevent accidents during childhood ("Kinder schützen – Unfälle verhüten").

Activities by the statutory accident insurers in day-care facilities, schools, and universities

The statutory accident insurance scheme in Germany also covers all children and adolescents in day-care facilities, schools, and universities. It is required by law to use any appropriate means to prevent accidents and occupational diseases and to ensure that effective first aid is provided. Since the introduction of accident insurance for schoolchildren in 1971, "technical accident prevention" has been developed into a comprehensive concept for promoting health and safety. It takes a consistent, holistic approach to issues of safety and relevance to everyday life.

The aim of promoting health and safety is to develop abilities and skills that help to maintain, improve, or regain health and safety. The public accident insurance insurers provide rules for designing buildings for schools and child-care facilities, information about safety in school sports and promoting physical activity, and media and programmes on road safety. Almost all accident insurers have implemented

the concept of schools that promote physical activity ("Bewegungsfreundliche Schule").

Activities in the area of traffic safety for children

The massive decline in the number of children killed in traffic accidents in recent decades shows that work to improve the safety of road traffic in Germany has been successful. The German federal government is of the view that further improvements in traffic safety are not merely the duty of the politicians, but are also a duty for society at large. For that reason, the Federal Ministry of Transport, Building, and Urban Affairs is working with many forces of civil society and promoting measures by the German Road Safety Council ("Deutscher Verkehrssicherheitsrat e.V., DVR") and its members, particularly the German Traffic Observatory ("Deutsche Verkehrswacht e.V., DVW").

Efforts are focused on actions to improve training in road safety outside of schools. The Child and Traffic Programme ("Kind und Verkehr"), which has received federal funding since 1980, addresses parents evenings in kindergartens and day-care facilities with the aim of helping parents prepare their children for safe participation in road traffic.

At the same time as the Child and Traffic Programme, a new programme is being developed in which teachers can speak to children – particularly in the last year of kindergarten – to increase their awareness and prepare them directly for their future participation in road traffic.

Safe cycling by children is also part of the "Bicycle Weeks" ("Fahrradwochen") conducted by The German Road Safety Council and funded by the federal budget. The Councils provide information on safety aspects and the risk of accidents during "action days" at town festivals and bicycling and other major events.

Increased use of the 30 kilometre per hour speed limit zones and "playing zones" also promote traffic safety for children. Other important actions being taken are the development of safer child seats, stricter enforcement of speed limits (particularly near schools), and the introduction of the requirement to use child restraint systems.

Under the motto "Better be considerate" ("Rücksicht ist besser"), the German Federal Ministry of Transport, Building and Urban Affairs ("Bundesministerium für Verkehr, Bau und Stadtentwicklung, BMVBS") is working with the support of various civic groups to ensure that consideration again becomes the most important principle for getting along with each other in traffic and to make a noticeable improvement to the atmosphere on the road in Germany.

Training about road safety is mandatory in German schools, and the German states ("Länder") are responsible for this. They provide their own curricula or assistance. The "Recommendation on training about road safety in schools" ("Empfehlung zur Verkehrssicherheit in der Schule")³ specifies the scope of training in road safety, topics to be covered, and methods to be used.

In addition to mandatory training about road safety in schools, many German states support on-site activities related to accident prevention. In the state of Saxony-Anhalt, for example, many projects and activities in the area of accident prevention are offered in children's day-care centres and schools: Model projects of the Saxony-Anhalt State Health Association ("Landesvereinigung für Gesundheit Sachsen-Anhalt e.V.") and the Saxony-Anhalt Accident Insurance Fund ("Unfallkasse Sachsen-Anhalt") which tested ways to prevent accidents, include "A safe start in kindergarten" ("Sicher starten im Kindergarten"), "My school's really safe" ("Ganz sicher meine Schule"), and "Action – With safety" ("Action – mit Sicherheit"). There was a positive effect on the incidence of accidents and safe physical activity was promoted in the institutions concerned. Mainly the number of severe accidents declined.

► Outlook

The available data show that over half of all accidents involving children and adolescents occur at home and during leisure time. This demonstrates the need for more focused education about how to avoid accidents. This has been done, among other things, by the creation of the Safe Kids Germany ("Bundesarbeitsgemeinschaft Mehr Sicherheit für Kinder e.V."). Parents should increasingly direct their attention to potential preventive safety measures at

home and in the private sphere. Specific safety measures are important in that regard, as is proper use of household appliances and tools. Safe Kids Germany prepared "Recommendations on further development of the prevention of childhood accidents in Germany" ("Empfehlungen zur Weiterentwicklung der Kinderunfallprävention in Deutschland") in November 2006. The objective of the recommendations is a systematic, continuous reduction in the number of childhood accidents in Germany. The importance accorded by society to the prevention of childhood accidents should be increased and more intensive, networked preventive efforts that include the ministries concerned should be expanded.

The European Union is also tackling this issue, and in 2006 a draft Council recommendation on the prevention of injury and the promotion of safety has been submitted. One of its target groups is children and adolescents. The recommendation includes establishing a community-wide injury surveillance system to collect injury data provided by the Member States, as well as establishing a community-wide mechanism for the exchange of information on good practices and disseminating this information to relevant stakeholders.

4.3 Promoting physical activity

Physical activity has a positive effect on health at every age. Getting enough exercise plays an important role in the physical, mental and even social development of children and adolescents. Regular exercise and physical activity are necessary so that children can explore their surroundings, improve their motor skills, and test their own physical limits in social interactions with others of the same age. There are many indications that the early years set the stage for an active lifestyle later. For example, a link can be established between a lack of physical activity during childhood and overweight and associated diseases later in life. A sedentary lifestyle is a major risk factor that can contribute to cardiovascular disease, diabetes, and back pain. In contrast, an active lifestyle helps to maintain and promote health, vitality, and quality of life.

Against that background, the expansion of prevention programmes and the promotion of health in the areas of everyday physical activity and sports are of major importance for health

policy in Germany. When taking a holistic preventive approach, an active lifestyle also includes the promotion of a balanced diet and a positive way to cope with stress.

► Data on the physical activity and motor skills of children and adolescents

Current data from KiGGS, the German Health Survey for Children and Adolescents, allows a comprehensive analysis of the physical activity and motor skills of the upcoming generation, thereby supporting the planning and implementation of health-related interventions (see 1.4).

Most girls and boys between 3 and 10 years of age exercise regularly: 77 % play outdoors almost every day, and almost as many engage in sports at least once a week. Children from families with migration background and with a low socio-economic status are much less active.

84 % of adolescents between 11 and 17 years of age are so active during their leisure time that they sweat or get out of breath at least once a week. Some 23 % reach this level of activity almost every day. 66 % of adolescents rate their own physical fitness as very good or good.

In contrast to the childhood years, clear sex-specific differences in the pattern of activity appear during adolescence: girls are less active during their leisure time and rate their physical fitness lower. This is particularly clear for girls from families with migration background and with a low socio-economic status.

As part of the motor fitness module of KiGGS, children and adolescents aged between 4 and 17 years were also examined with regard to their motor skills and physical and athletic activity.

The results for endurance, strength, coordination, and mobility clearly show that most boys and girls in Germany are physically active and participate in sports. At the same time, shortcomings were discovered that indicate underlying potential for preventive measures during childhood and adolescence. Above all, differences in the physical activity and motor skills of the youngsters based on sex, migration status, and socio-economic status indicate potential starting points for targeted interventions.

► Data on the prevalence of overweight and obesity in children and adolescents

A total of 15 % of children and adolescents between 3 and 17 years of age are overweight, and more than one third of them or 6.3 % of all children and adolescents are obese. This has been shown within the framework of KiGGS.⁴ Socially disadvantaged children, children with migration background, children who were not breastfed, and children whose parents are also overweight are at greater risk for being overweight and obese. Figure 7 shows that the percentage of obese children rises with age.

► Measures to promote physical activity

Promoting healthy lifestyles is a task for society as a whole; it involves various policy aspects and approaches by several government departments. In addition to measures at the federal level, numerous efforts are also being made under state responsibility and at local authority level. The health insurance funds and local sports associations are also very active in this area. The German federal government is taking various health-related measures to encourage people, particularly children and adolescents, to be more physically active and to eat a more balanced diet based on their actual require-

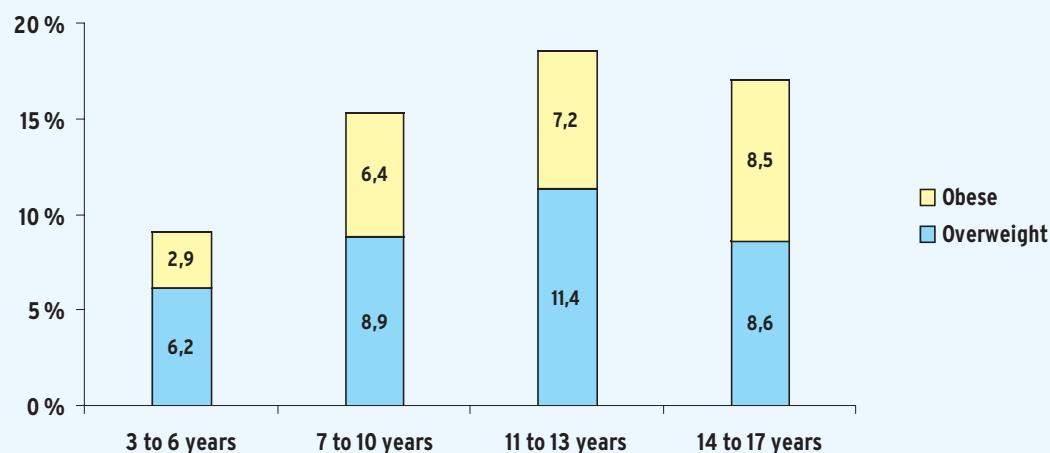
ments. The following examples show initiatives at the federal level in Germany.

To enhance preventive measures to improve health, the Federal Ministry of Health initiated the “Activity and Health” (“Bewegung und Gesundheit”) campaign in 2005. The slogan “Germany’s getting fit. Why not join in?” (“Deutschland wird fit. Gehen Sie mit.”) is intended to motivate people of all ages to introduce more physical activity into their daily routines by walking 3,000 extra steps a day.

The German Forum on Disease Prevention and Health Promotion (“Deutsches Forum Prävention und Gesundheitsförderung”) has regularly explored the topic of exercise in connection with diet and coping with stress, and in January 2007 organised a conference on “Physical activity as part of everyday life – where people live and work” (see 2.2).

The Federal Centre for Health Education has been targeting children and adolescents for many years, providing comprehensive information and conducting campaigns with an emphasis on socially disadvantaged regions. It highlights physical activity, along with balanced nutrition and positive ways to cope with stress, as shown by the young people’s campaign “Feeling good” (“Gut drauf”). The Federal Centre for Health Education has also published a brochure on evaluating the quality of programmes to prevent and treat overweight and

Figure 7: Percentage of overweight and obese children and adolescents by age in Germany from 2003 to 2006



Source: RKI 2006: German Health Survey for Children and Adolescents (2003 - 2006)

4. CEHAPE-RPG II

obesity in children and adolescents ("Qualitätskriterien für Programme zur Prävention und Therapie von Übergewicht und Adipositas bei Kindern und Jugendlichen").

The German federal government is conducting various campaigns to improve individual nutrition behaviour as well as the background conditions for health. For example, the initiative "Eat better. Exercise more. Light and easy" ("Besser essen. Mehr bewegen. KINDERLEICHT") includes numerous measures and campaigns such as "FIT KID – The healthy eating campaign for children's day-care centres" ("FIT KID – Die Gesund-Essen-Aktion für Kitas"), "School + FOOD = Top marks" ("Schule + Essen = Note 1") and a competition for ideas, all with the objective of effectively preventing overweight in children and adolescents. The Platform for Diet and Physical Activity ("Plattform Ernährung und Bewegung e.V., peb") is an instrument created with the participation of all societal parties involved to support and network the efforts of existing and new initiatives.

The German federal government is also actively participating in European and international initiatives. These include the European Union Platform on Diet, Physical Activity and Health, the EU Commission's Green Paper on Promoting Healthy Diets and Physical Activity, and the WHO Ministerial Conference on Counteracting Obesity, which was held in Istanbul in November 2006. Under the German presidency of the EU Council, this issue was also discussed during the conference on "Prevention for Health: Nutrition and Physical Activity – A Key for Healthy Living" in February 2007. A memorandum was adopted that also specifies further commitments to preventive measures to improve the health of children and adolescents.

The German states are also making great efforts to prevent overweight and obesity, particularly in children and adolescents, and to promote an active lifestyle. For example, the state of Saxony-Anhalt has been funding numerous model projects since 1998, ranging from whole-food cooking to "teaching on the move" ("Bewegter Unterricht") in schools. The state sports association and the Saxony-Anhalt Health Association ("Landesvereinigung für Gesundheit Sachsen-Anhalt e.V.") are supporting preventive efforts with an initiative to establish and expand sports activities to promote health. Almost all of the activities emphasise socially disadvantaged population groups.

► Outlook

In view of the data on overweight and physical activity among children and adolescents, it will also remain necessary in the future to offer and further improve targeted measures, subject to quality assurance. Data that are available or will be provided after further evaluation should be reflected in appropriate plans for preventive efforts. Children and adolescents are an important target group because it is undisputed that a health-promoting lifestyle from birth makes a major contribution to a healthy life. Major steps have already been taken by the German federal government, such as the Physical Activity and Health campaign. Overall, many initiatives and campaigns in Germany – some of them funded by the federal government – by the health insurance funds, sports associations, and others are primarily aimed at children and adolescents.

Current measures need to be better coordinated and networked. There should also be an exchange among the various actors, and initiatives from other European countries should be better included.

¹Corresponds to 0.05 % of the population in this age group (11.924 million).

²"Having an accident" as used here includes traffic participants who were injured or killed.

³Resolution of the Conference of Ministers of Education and Cultural Affairs of 17 June 1994.

⁴In accordance with the recommendations of the German obesity study group AGA ("Arbeitsgemeinschaft Adipositas im Kindes- und Jugendalter"), reference data on the distribution of the body mass index (BMI = body weight in kg / height in m²) is used to define overweight and obesity. Children whose BMI is higher than the BMI of 90 % of children in the individual age and sex group of the reference population (90th percentile) are considered overweight. A child is considered obese above the 97th percentile.

Additional information:

*Campaign "Eat better. Exercise more. SO EASY A KID CAN DO IT" (Besser essen. Mehr bewegen. KINDER-LEICHT) (German Federal Ministry of Food, Agriculture and Consumer Protection):
<http://www.kinder-leicht.net>*

Central Federation of Public Sector Accident Insurers (BUK): <http://www.unfallkassen.de>

Federal Centre for Health Education (BZgA): <http://www.bzga.de>

Federal Ministry of Food, and Agriculture and Consumer Protection (BMELV): <http://www.bmelv.de>

Federal Ministry of Health (BMG): <http://www.bund.bmg.de>

*Federal Ministry of Labour and Social Affairs (BMAS) (occupational health and safety):
<http://www.bmas.bund.de/BMAS/Navigation/arbeitsschutz.html>*

Federal Ministry of Transport, Building and Urban Affairs (BMVBS): <http://www.bmvbs.de>

"FIT KIT" project of the German Nutrition Society (DGE): <http://www.fitkid-aktion.de>

Forum on Prevention and Health: <http://www.forumpraevention.de>

German Health Survey for Children and Adolescents (KiGGS): <http://www.kiggs.de>

German Road Safety Council (DVR e.V.): <http://www.dvr.de>

German Traffic Observatory (DVW e.V.): <http://www.dvw-ev.de>

Platform for Diet and Physical Activity (peb e.V.): <http://www.ernaehrung-und-bewegung.de>

"Prevention" campaign (German Federal Ministry of Health): <http://www.die-praevention.de>

Robert Koch Institute (RKI): <http://www.rki.de>

Safe Kids Germany: <http://www.kindersicherheit.de>

*"School + Eating = Top marks" (Schule + Essen = Note 1) project of the German Nutrition Society:
<http://www.schuleplusessen.de>*

5. CEHAPE - Regional Priority Goal III: Clean air as a way of preventing respiratory diseases

5.1 Introduction

Air pollution can harm human health and cause respiratory diseases, such as asthma. One of the goals of WHO's Children's Environment and Health Action Plan for Europe (CEHAPE) is therefore to reduce pollution in ambient and indoor air and reduce the frequency of illnesses it causes. The objective is for all children in Europe to be able to grow up in an environment where a clean air exists.

In Germany stringent legislation regulating industry, traffic and private households has led to a clear reduction in ambient air pollution in recent decades.

People in Germany spend a large part of their life indoors. The quality of indoor air can be negatively influenced by numerous sources of pollution. Tobacco smoke is the most significant and most dangerous avoidable indoor air pollutant that can damage human health.

Political attention is increasingly focusing on indoor spaces as possible places where the public might suffer exposure to pollution. The German federal government has initiated numerous activities in this field.

5.2 Ambient air quality

Ambient air pollution of the ambient air from emissions from power plants, industrial installations, traffic, agriculture and private households jeopardizes human health and the environment. A high concentration of air pollutants, such as sulphur dioxide (SO_2), nitrogen oxides (NO_x), ammonia (NH_3) and volatile organic compounds (VOCs)¹, leads to eutrophication (caused by NO_x , NH_3), acidification (caused by SO_2 , NO_x , NH_3) and summer smog as a result of ground-level ozone (caused by NO_x , VOC).

Ozone can be harmful to human health, causing irritation to the eyes, throat and mucous membranes, and changes in lung function. A high concentration of particulate matter (PM_{10}) in ambient air can cause serious damage to health and lead to a rise in the mortality rate from cardiovascular diseases.

Everyone may be affected by the negative effects of ambient air pollution, but asthmatics, babies and toddlers are particularly at risk. Children have to be classified as a risk group because they breathe a greater volume of air per minute relative to their body weight than adults.

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Air pollution, especially from vehicle exhaust, can cause permanent damage to children's lungs. Soot particles in ambient air can also lead to a rise of respiratory tract infections in babies and, particularly in conjunction with ozone, can aggravate asthma and cause a rise in cases of coughs and bronchitis.

► Measures and activities to control ambient air quality

For a long time one of the main concerns of German environment policy has been to improve the quality of ambient air and thus make a positive contribution to the health of the population, especially babies, children and adolescents. As a result, stringent legislation that has been passed over the last 20 years in Germany has brought about increasingly clean air. The trend in emissions of various air pollutants in Germany is regularly recorded and published. The "Daten zur Umwelt" brochure, which is published by the Federal Environment Agency ("Umweltbundesamt, UBA") and is also available online, gives an overview of these trends.

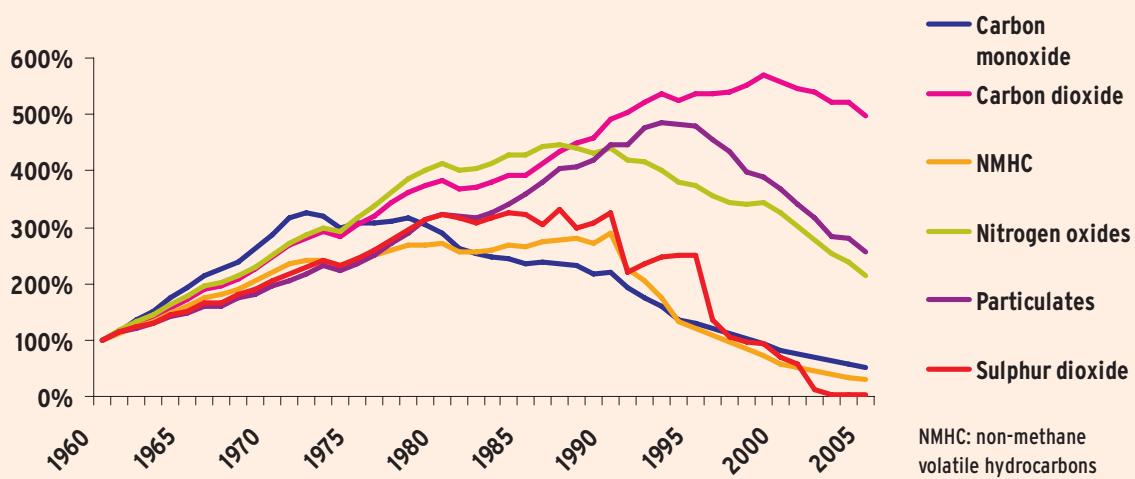
The improvement of ambient air quality in Germany is primarily a result of the Federal Immission Control Act ("Bundesimmissionsschutzgesetz, BImSchG") which came into force in 1974 and has been amended several times since. Its scope covers power plants, industrial installa-

tions, waste incineration facilities and motor vehicles. The Act makes it possible to stipulate limit values for emissions for different pollutants and to define air quality standards with respect to pollutants concentrations (immission). The Federal Immission Control Act is concretised by secondary legislation – such as the Federal Immission Control Ordinances ("Bundesimmissionsschutz-Verordnungen, BImSchVen"), which, for example, regulate in detail the permitting and operation of plants and air quality standards, or the Technical Instructions on Air Quality Control ("TA Luft").

The UN/ECE Convention on Long-range Transboundary Air Pollution (known as the Geneva or LRTAP Convention²), which was passed in 1979, and the EC Air Quality Framework Directive (96/62/EC) and the daughter directives based on it have been implemented in Germany by ratification legislation and by the Federal Immission Control Act and the Federal Immission Control Ordinances. The Technical Instructions on Air Quality Control regulate in greater detail things such as the operation of plants. The Framework Directive's objective is to ensure consistently high air quality across all EU countries. Amongst other things, the daughter directives set air quality limit values to control ambient air pollution by particular pollutants.

To ensure compliance with these limit values, the German states are obliged to put in place

Figure 8: Change in exhaust from motor vehicles in Germany from 1960 to 2005



Source: Federal Environment Agency 2007

reduction measures based on air quality control plans. Great effort will be needed to achieve long-term compliance with the limit values set – for example for particulate matter – particularly in urban agglomerations.

The German federal government has put in place numerous measures to improve the quality of ambient air quality: for example, in May 2000 it approved the Action Programme Summer Smog. This programme consists of 17 measures with long-term effect, designed to reduce the nitrogen oxides and volatile organic compounds which are the precursors of ground level ozone. Other examples of measures of this kind include imposing a toll for heavy goods vehicles, the introduction of exhaust tests for motorcycles and shifting freight transport from the road to rail and waterways.

Furthermore, in March 2003 a broad-based national programme was approved that incorporated the previous programme of action on ozone designed to implement Directive 2001/81/EC on National Emission Ceilings (NEC Directive). Its aim is to further reduce the concentrations of sulphur dioxide, nitrogen oxides, ammonia, and volatile organic compounds. The programme lists the measures that have to be put in place by 2010 to ensure compliance with the EC Directive. The national programme was updated on 1 October 2006.

Emissions of nitrogen oxides dropped between 1990 and 2004 by about 45 %, emissions of volatile organic compounds by about 65 %. This success also brought about a reduction in ground-level ozone concentrations. In recent years there has been a drop in the number of occasions on which the ozone alert threshold of $240 \mu\text{g}/\text{m}^3$ has been exceeded. However, the decline of emissions of nitrogen oxides has slowed down again in recent years.

Currently sulphur dioxide pollution has now been reduced to a tenth of what it was in 1970, which has resulted, amongst other things, in a reduction in "acid rain". Furthermore, since the winter of 1995/96, the critical pollution levels that had caused the phenomenon of "winter smog" in previous years have never again been reached anywhere in Germany, even under unfavourable conditions. It was therefore possible to abolish the winter smog alert regulations in Germany. Particulate matter pollution in industrial agglomerations, such as the Ruhr area, has been reduced by around 60 % since 1980. Nev-

ertheless, ambient air quality limit values for particulate matter in Germany are still being breached, especially in agglomerations with high volumes of traffic.

The German federal government's air quality policy relies as much as possible on a strategy of creating economic incentives rather than issuing bans. Since 1 January 2003, mineral oil tax on "sulphur-free" fuel, containing a maximum of 10 mg of sulphur per kg fuel, has been 1.5 euro cents per litre lower than on fuel with a higher sulphur content. The result of this is that there is virtually no fuel with high sulphur levels in Germany today. The German federal government also promotes alternative fuel in a number of ways. For example, the mineral oil tax rate for natural gas has been set at a considerably lower rate until 2020. In Berlin a number of public agencies, including the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety ("Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, BMU"), have set themselves the goal of promoting and deploying 1,000 "eco-taxis" that run on natural gas; they have already become a feature on the streets throughout most of the city.

In 2002, the German federal government presented a National Cycling Plan ("Nationaler Radverkehrsplan"). The period 2002 to 2012 will see the launch of new ways of promoting cycling and new implementation strategies, recommendations for action, and a contribution to a cycle-friendly climate in Germany. An online bicycle portal provides information about events, news, publications and practical examples on promoting cycling as part of a sustainable transport policy. Since 2004, two million euros have been set aside in the federal budget for non-investment measures to implement the National Cycling Plan, which are available for measures initiated by the federal government, the states, local authorities and private actors. Model projects are being funded that are contributing to greater use of the bicycle in Germany. Children and adolescents, both in the school and leisure sector, are an important target group. Between 2002 and 2004, the Federal Environment Agency also carried out a project "Status of mobility education and advice in German schools and developing an exemplary approach to delivering sustainability education and advice in German schools taking environmental and health aspects into account." Its aim was to encourage children and adolescents

in the long-term use of environmentally friendly means of transport, such as bicycles, bus and trains, and walking. There was a deliberate focus on reinforcing independent mobility for young people and reducing “accompanied mobility” with parent involvement.

In line with the EC Ozone Directive (2002/3/EC) of February 2002, the public is now informed if the ambient ozone-concentration, averaged over an hour, exceeds 180 µg/m³ of air (information threshold). Above the information threshold it is recommended that people should not exert themselves outdoors for a sustained period of time. In Germany the Federal Environment Agency publishes current ozone levels on the internet. In May 2006, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety published an information brochure on the topic “A lot of summer – not much smog. Take action to prevent summer smog” with the aim of providing the public with information about the dangers of summer smog and possible protective measures.

► Outlook

The stringent legislation of recent years has led to a significant improvement of ambient air quality. Nevertheless, this trend has been stagnating since 2000. First and foremost, pollutants that are harmful to health – including those from motor vehicles, such as nitrogen oxides and volatile organic compounds, that are chiefly responsible for the high ozone levels – and particulate matter emissions need to be further reduced. Since the number of motor vehicles in Germany has risen steadily since the end of the Second World War and cars are indispensable for many people both for their family life and their work, it is particularly important that we establish forms of an environment- and healthy compliant mobility. In terms of protecting health, particularly children’s health, not only summer smog but also fine particulate matter is a problem that must be taken seriously. It is also a problem that must be addressed not only on a national level but also through international collaboration.

5.3 Indoor air quality

People in Germany spend up to 80 or 90 % of their life indoors, mostly in their own home or in offices, but also in public buildings such as schools and children’s daycare centres. Indoor air quality is not always conducive to health. The quality of indoor air can be negatively affected by pollutants from a number of sources. They include building materials, furniture and interior fittings, from which chemicals – particularly volatile and semi-volatile organic compounds (VOCs/SVOCs) – can be released.

Opening windows can also contribute to polluting indoor air, for instance by admitting particulate matter from the ambient air. Temporarily active indoor air sources include first and foremost smoking tobacco (see 5.4), which like other habits such as burning candles in the home or using scented oils in lamps, has a negative effect on indoor air quality. But pollutants in indoor spaces can also come from cooking, particularly on gas, and from open fires, painting and decorating. People themselves impair the quality of indoor air, by breathing out carbon dioxide and moisture. Moisture is also produced indoors by activities such as showering and washing and drying clothes and can under certain conditions cause bacteria and mould to grow. Particulate matter and VOCs/SVOCs get into indoor air during decorating and DIY work. The indoor air can also be polluted with radioactive radon (see 6.3 and figure 9).

Chemical and microbiological pollutants in indoor air have a negative effect on people’s health and sense of well-being. They can cause stinging eyes, conjunctivitis, nasal irritation and sinusitis, hoarseness, bronchitis, asthma, rashes, allergies, headaches and concentration problems. Environmental and health policymakers in Germany are thus concerned to protect everyone, but in particular babies, toddlers and children, from the harmful effects on health caused by indoor air pollutants.

Numerous activities have been carried out in Germany to achieve better indoor air quality. For example, provisions on biocides were added to the Chemicals Act (“Chemikaliengesetz, ChemG”) tightening up the regulations on licensing biocide products. Some secondary legislation, such as the Ordinance on bans and restrictions of dangerous substances (“Chemikalien-Verbotsverordnung, ChemVerbotsV”) was passed or amended. New specifica-

Figure 9: Where does indoor air pollution come from?	
Source	A selection of compounds/classes of compounds released
People themselves	Carbon dioxide, water vapour, body odours
Heating and cooking	Oxides of nitrogen and carbon, VOCs, water vapour, particulate matter
Smoking tobacco	As for heating and cooking, with the addition of nicotine, nitrosamines, cyanides, benzene, formaldehyde, benzo(a)pyrene
Household and hobby products	VOCs (volatile aromatic and aliphatic hydrocarbons, alcohols and others)
Furnishings	VOCs
Building and decorating work	VOCs and semi-volatile organic compounds, pesticides, mineral fibres
External environment	Ambient air pollutants, radon
VOC = Volatile Organic Compounds	
Source: BMU 2005: UMWELT 6/2005	

tions were developed for detergents and cleaning products, commercial installations and air conditioning systems. Keeping the public informed about the causes of indoor air pollution and how to prevent it is also one of the German federal government's key concerns.

► Measures and activities on indoor air quality

There is no specific legislative basis for setting statutory requirements for indoor air quality. Indoor air pollutants come from different sources and have different underlying causes that in turn are subject to different legislation. The main legislation in this category includes the Building Products Act ("Bauproduktengesetz"), the Chemicals Act, the Food and Feed Act (refers also to Consumer Products or "Bedarfsgegenstände", i.e. products that the consumer comes into direct contact with, such as body care products, toys or cleaning products; "Lebensmittel-, Bedarfsgegenstände- und Futtermittelgesetz"), the Detergents and Cleaning Products Act ("Wasch- und Reinigungsmittelgesetz"), the Biocides Act ("Biozidgesetz"), the Infection Protection Act ("Infektionsschutzgesetz") and the Plant Protection Act ("Pflanzenschutzgesetz") (see 6.1).

One possibility for improving the quality of indoor air is offered by the Building Products Act

of August 1992 – based on EC Directive 89/106/EEC (Construction Products Directive) of December 1988. It regulates matters pertaining to construction products being placed on the market and trade in these products.

Chemicals legislation offers the possibility under the Ordinance on bans and restrictions on the placing on the market of dangerous substances, preparations and products of partially or totally withdrawing substances from the market and thus preventing or reducing pollution of indoor spaces by these substances. Examples of substances relevant to indoor spaces that are covered by this Ordinance include formaldehyde, pentachlorophenol and polychlorinated biphenyls (PCBs). This legislation has contributed to considerable reductions in emissions of individual substances.

With a view to further improving health protection, EU Environment Ministers in Brussels adopted the REACH Regulation on Registration, Evaluation, and Authorisation of Chemicals on 18 December 2006. It will come into force on 1 June 2007 (see 6.1).

The Commission on Indoor Air Quality ("Innenraumlufthygiene-Kommission, IRK") at the Federal Environment Agency³, is particularly important for health-related aspects of the topic of indoor air. It has produced recommendations and opinions on numerous topical questions relating to indoor spaces, such as "Hy-

giene problems connected with air conditioning systems", "Biological contaminants in indoor air" and "Emissions from construction products". However, they not only write opinions aimed at experts but also produce brochures and guidance booklets aimed at consumers. The Commission on Indoor Air Quality has also prompted the establishment of important technical committees, including the Committee for Health-related Evaluation of Building Products ("Ausschuss zur gesundheitlichen Bewertung von Bauprodukten, AgBB") and the ad-hoc working group consisting of representatives from federal and state agencies established to set guideline values for individual indoor air contaminants (see below).⁴ The aim of the Commission on Indoor Air Quality's work is to evaluate the risk to health connected with spending time indoors and, where necessary, recommend measures to remedy the situation.

In December 1993 a working group was set up to establish guideline values for indoor air. It consists of experts from the Commission on Indoor Air Quality and the working party on indoor air within the Permanent Working Group of the Highest State Health Authorities ("Arbeitsgemeinschaft der Obersten Landesgesundheitsbehörden, AOLG"). So far this working group ("Ad-hoc-AG IRK/AOLG") has worked out guideline values for organic compounds – such as toluene, dichloromethane, pentachlorophenol, styrene, tris(2-chloroethyl)phosphate, bicyclic terpenes, naphthalene –, for dearomatised hydrocarbon solvents and PCBs, mercury vapours and the inorganic gases carbon monoxide and nitrogen dioxide. Recommended values were also established for total volatile organic compounds (TVOCs). The commission gave an official opinion on the problems connected with evaluating diisocyanates. The recommended guideline values, along with earlier recommendations that already existed, have proved to be very useful in practice, making it possible to evaluate exposure to chemical pollutants in indoor air more effectively than in the past. Furthermore, the ad-hoc working group also published guidance for public health offices and monitoring institutes outlining recommendations for correct indoor air measurement depending on the type of building and on the use in practice of guideline and reference values. The aim is give consumers more confidence that a uniform procedure is being used to measure and more importantly evaluate contaminants in indoor air.

A range of different successful measures for preventing chemical pollutants in indoor air caused by building materials have been put in place in Germany. Examples include the introduction of low-formaldehyde chipboard and biocide-free wood treatment products for indoor use, a trend away from using highly volatile substances as solvents in paint, lacquer, varnish and adhesives, and the use and promotion of low-emission products. Environmentally sound products that are not harmful to health are labelled with the "Blue Angel" eco-label to help consumers make an informed choice when buying products.

Creating a healthy environmental quality in indoor spaces is one of the key areas of the work of the Action Programme Environment and Health ("Aktionsprogramm Umwelt und Gesundheit, APUG") (see 1.2). Combating mould is one of APUG's key areas of work. A number of research projects have improved the basic knowledge for assessing and evaluating mould and thus facilitated uniform evaluation of mould growth. Guidance booklets and brochures on the mould problem were also produced.

In 2002, the Commission on Indoor Air Quality produced a guidebook for prevention, testing, evaluation and remediation of mould in indoor spaces („Leitfaden zur Vorbeugung, Untersuchung, Bewertung und Sanierung von Schimmelzwachstum in Innenräumen“), known for short as the "mould guidebook", and in 2004 a brochure for the public entitled "Help! There's mould in the house" („Hilfe! Schimmel im Haus“). This brochure describes the phenomenon of mould, its causes and effects, and gives tips about how to prevent it from growing. To complement the "mould guidebook", a "mould remediation guidebook" was produced in autumn 2005 to assist property developers, consultants, architects and interested house owners. Mould remediation was also one of the main topics of the 12th "WaBoLu-Innenraumtag"⁵, a conference on indoor air quality that took place in May 2005 at the Federal Environment Agency. Participants discussed questions of proper ventilation and design and construction measures aimed at helping to prevent mould growth, and presented cases and solutions based on good practice.

The evaluation of the German Environmental Survey for Children (GerES IV), which is currently in progress, will provide important insights

into the body burden of pollutants and contaminants in children and on the adverse health affects they cause (see 1.4).

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety is a member of the European Commission's working group on indoor air. Under the German presidency, it will be holding on 4 and 5 June 2007 an international conference on health-related evaluation and limitation of indoor air emissions from building products.

At the beginning of 2005, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety compiled a report on the topic of indoor air hygiene, entitled "Improving indoor air quality – selected key areas for action from the Environment Ministry's point of view" ("Verbesserung der Luftqualität in Innenräumen – Ausgewählte Handlungsschwerpunkte aus Sicht BMU"). The aim of this report is to identify key areas for action needed to improve the quality of indoor air and ensure high quality indoor air in the long term.

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety has developed and compiled teaching materials for school classes entitled "I think it stinks! Environment and Health: On the Quality of Indoor Air" ("Mir stinkt's! Umwelt und Gesundheit: Zur Qualität der Innenraumluft"). These materials give school pupils information about sources of pollutants in indoor spaces and on the possibilities for improving air quality.

In 2000 the Commission on Indoor Air Quality developed a comprehensive guidebook for indoor air hygiene in school buildings ("Leitfaden für die Innenraumlufthygiene in Schulgebäuden"); today its recommendations and suggestions form the basis for assessing and evaluating the indoor air hygiene situation in schools and children's day care centres. This guidebook is currently being revised and the update is scheduled to be published in 2008. It will also contain information on particulate matter in school buildings.

As part of APUG a brochure for consumers was published in April 2005 entitled "A healthier home – but how? Practical everyday tips" ("Gesünder wohnen – aber wie? Praktische Tipps für den Alltag"). The brochure describes hygiene problems in the home in an easily understandable form, identifies their causes and

makes recommendations about how to prevent or reduce indoor air pollution. In November 2006 a brochure containing further information on building products was published under the title "Building products: identifying and preventing pollutants and odours" ("Bauproducte: Schadstoffe und Gerüche bestimmen und vermeiden").

Supplementing federal level measures and activities to improve indoor air quality, the German states have also launched numerous initiatives. In view of the fact that the indoor air quality in schools is still dissatisfying, the State Working Group on Environment-Related Health Protection ("Länder-Arbeitsgruppe Umweltbezogener Gesundheitsschutz, LAUG") decided in autumn 2005 to implement further measures to improve air quality in schools. They include plans to re-assess carbon dioxide and particulate matter levels in indoor air in schools. Schleswig-Holstein has a monitoring programme to establish current reference values in the state. In this particular state, background values for indoor air pollution in schools and kindergartens were established 10 years ago. A change in products in recent years has changed the composition and the levels of individual contaminants in the indoor air and in addition new pollutants are increasingly being identified (e.g. glycol ethers). The background values for indoor air are currently being updated as part of ongoing monitoring programmes.

In schools and community facilities in the states of Baden-Württemberg, Berlin, Bavaria and Hesse, studies on levels of particulate matter in indoor air during lesson time – measured in terms of particulate mass – revealed a high level of pollution. Further investigations are needed to establish to what extent the indoor air depends on cleaning and ventilating behaviour and to look at the composition of the particulate matter in the indoor air and its health risks. This links in with research projects being conducted by a number of states, such as PAMINA (Particulate Matter in Indoor and Ambient Environment) and an interstate testing programme in public facilities.

The idea of the research collaboration is to acquire more precise knowledge of the pollution situation in indoor spaces and identify the contribution made by different sources. The question of whether the samples of particulate matter collected are distinct in composition and effect is of particular significance. This would

make it possible to estimate the contribution of particulate matter in indoor air to the overall health risk. The influence of ventilation and cleaning on particulate matter levels in indoor air is also being investigated with a view to deriving from the results recommendations for appropriate cleaning. Events are held to give education authorities, school management and users of the spaces comprehensive information on the topic of indoor air quality.

The Bavarian Health and Food Safety Authority ("Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit") has developed a CO₂ air quality "traffic light" that gives visual and acoustic information about air quality. These air quality traffic lights are scheduled to be used in pilot projects schools to raise awareness among users of the space about correct and energy-efficient ventilation.

► Outlook

The numerous measures and activities put in place by the German federal government and the German states have made an important contribution to improving the quality of indoor air. Only in rare cases today is the concentration of indoor air pollutants so high that acute effects on health could arise. Nevertheless, indoor air quality will remain an important topic in the future, since new products for building and furnishing homes mean that the pattern of substances released into the indoor air in homes will continue to change. This means that consumers must take even greater responsibility – on matters of ventilation and heating, for example. They themselves have a significant influence on the quality of indoor air. In addition, when purchasing products they should take care to use only those products that release low levels of substances into the indoor air, or better still none at all.

Informing the public about pollution factors and options for action that are relevant to indoor spaces will remain one of the federal government's priority areas of work. The aim is to raise public awareness about the importance of indoor air hygiene for human health, and particularly the health of babies, toddlers and children.

5.4 Protection from tobacco smoke

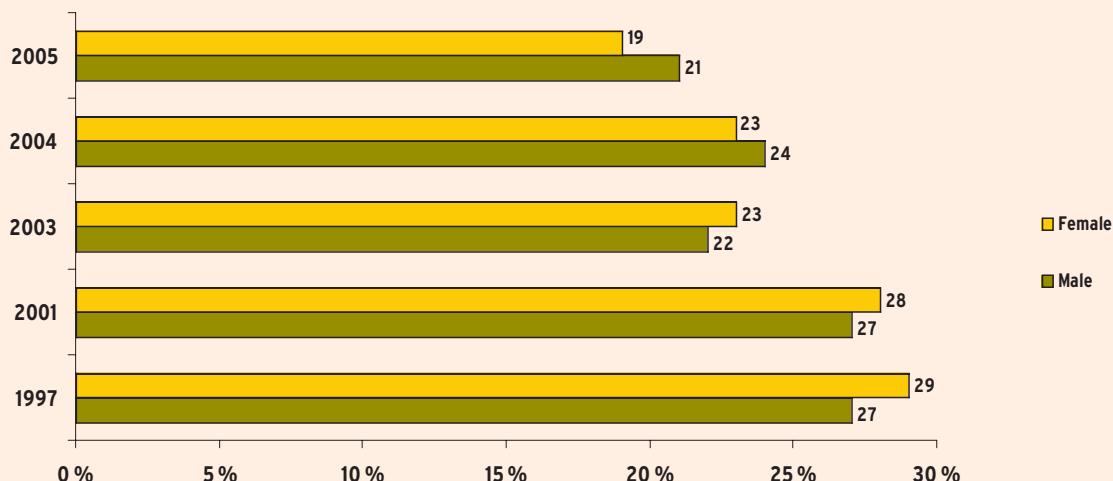
Tobacco smoke is by far the most significant and most dangerous indoor air pollutant. It is the leading cause of air pollution in indoor spaces where people smoke. It is also avoidable. In 2006, 256 million cigarettes were smoked each day in Germany. Cigarette smoke contains over 4,000 chemicals, including numerous toxic and carcinogenic substances such as benzene, cadmium and formaldehyde. The health risk from smoking is not confined to the person actually smoking. On the contrary, non-smokers who have been exposed to tobacco smoke can suffer serious damage to their health, such as acute and chronic cardiovascular diseases, cancer, or diseases of the lower respiratory tract, such as pneumonia, or asthma. Non-smokers can also die as a result of passive smoking.

Babies, toddlers and children cannot protect themselves from exposure to tobacco smoke since they cannot simply avoid smoky environments. Every other child in Germany lives in a household in which at least one person smokes. Every fifth child has also been put at risk due to exposure in the womb to tobacco smoke. The organism of the foetus or child shows a more sensitive reaction to tobacco smoke than adults. It is essential therefore that they be specially protected from tobacco smoke.

► Prevalence of smoking

Since the mid-1970s, studies have been carried out in Germany at regular intervals of roughly four years on the smoking behaviour of children and young people aged between 12 and 25 – and adults. Since the beginning of the 1990s there has been a marked rise in smoking among children and young people. Starting in 2001 a reversal in the nicotine consumption trend in the younger age groups can be observed: between 2001 and 2005 there was a drop in the smoking rate in 12 to 17-year-olds from 28 % to 20 % – in girls the figure dropped from 28 % to 19 %; in boys from 27 % to 21 %. And there was a marked rise in the proportion of young people who had never smoked, particularly among younger adolescents aged 12 to 15 in recent years. In 2001 almost half of this group (48 %) had never smoked; in 2005 that figure had risen to about two-thirds (62 %).

Figure 10: Change in the smoking behaviour of adolescents between ages 12 and 17 in Germany from 1997 to 2005



Source: BZgA 2005

A study of the adult population conducted in 2004 revealed that about 34 % of adults between 18 and 59 smoke – 31 % of women and 37 % of men. That means around 17 million Germans smoked. In 2003, the smoking rate for women of childbearing age (20 to 39) was particularly high at 40 %. Fortunately there has been a drop in numbers of smokers in this age group, a smoking rate of less than 30 % having now been achieved.

► Measures and activities to protect people from tobacco smoke

To encourage non-smoking and protect people from second-hand smoke, federal and state agencies in Germany have taken comprehensive preventive measures in recent years, both in terms of structures and legislation. In the area of prevention, a campaign to encourage young people not to smoke has been running since 2001 under the umbrella of the national “smoke-free campaign”. The aim is to stop people from taking up smoking and encourage smokers to give up smoking. A comprehensive package of coordinated measures has been specially developed for children and adolescents.

In addition to that, the German federal government has put in place measures aimed at promoting non-smoking in the adult population. It is expected that adults’ giving a clear signal

against tobacco products will have a positive impact on reducing smoking among children and adolescents. The idea is to convey the message that not smoking is the social norm.

The German federal government is very concerned to protect children from passive smoking. To achieve effective protection of children and unborn children from the negative effects of tobacco smoke, parents have been made more aware of the health risks involved in smoking through targeted public education campaigns in recent years. The insight that all places where children spend time should be kept free of smoke is important. A further aim is to lower the smoking rate for young adults, pregnant women and parents. The participation of healthcare professionals – particularly from the fields of gynaecology and paediatrics and midwifery – has an essential role to play in providing advisory services here. The German Federal Centre for Health Education (“Bundeszentrale für gesundheitliche Aufklärung, BZgA”) was commissioned by the federal government to develop guidebooks on the topic of “smoking in pregnancy” specifically for these groups of professionals, which were distributed to doctors’ surgeries throughout the country. They are complemented by brochures providing information to pregnant women, parents-to-be and young families about the dangers of smoking and passive smoking and giving assistance in giving up smoking. The key area of protecting children from passive smoke in the

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family is underpinned by TV spots as a way of using the media to reinforce people's awareness and motivation to give up smoking or not take it up in the first place.

As far as legislation is concerned, the Youth Protection Act ("Jugendschutzgesetz"), which came into force in 2003, should be mentioned. This Act makes it illegal to sell tobacco products to adolescents under the age of 16. The Protection from the Dangers of Passive Smoking Bill ("Gesetz zum Schutz vor den Gefahren des Passivrauchens"), which had its first reading in the German Bundestag on 27 April 2007, proposes tightening up provisions to protect young people, which would include a complete ban on the sale of tobacco products to adolescents under the age of 18. This effectively complements the existing ban on adolescents smoking in public. The 2003 Youth Protection Act also includes restrictions on tobacco advertising in cinemas and restrictions on children and adolescents accessing cigarette vending machines from 1 January 2007. In terms of structural changes, the three-stage rise in tax on tobacco in recent years has been a successful health policy.

The Protection from the Dangers of Passive Smoking Bill proposes not only tightening up provisions to protect young people but also contains a blanket ban on smoking in all public institutions at federal level, on public transport and in railway stations. It also proposes improved regulations in the area of health and safety in the workplace.

In parallel to this, the German states are working to produce solutions that are as uniform as possible in their fields of competency. This includes protecting non-smokers in restaurants and pubs. Following a resolution of the heads of government of the German states of 22 March 2007, there is a consensus that protection for non-smokers must be guaranteed, in particular in the following areas:

- Facilities for children and adolescents, including educational and leisure facilities,
- Health and social care facilities,
- Administrative agencies at state and local authority level, including Land corporations, institutions and foundations,
- Facilities where works of artistic, entertainment or historical form or content are stored, conveyed, performed or exhibited, if they are accessible to the public,

- Discotheques, particularly with a view to protecting adolescents and young adults.

There is also agreement among the states that a complete ban on smoking in enclosed spaces in restaurants and pubs – irrespective of the size or nature of the establishment – must be achieved. Most of the state-level regulations on protection of non-smokers are expected to come into force sometime in 2007.

The Action Plan on Drugs and Addiction ("Aktionsplan Drogen und Sucht") that was adopted in 2003 contains far-reaching goals and activities of an effective anti-tobacco policy. Through this the topic of tobacco prevention has become a stronger element in the discussion at state and local authority level and led to a wide range of activities designed to promote protection from passive smoke.

► Outlook

In recent years, the federal government and the states have launched numerous important preventive measures against smoking and passive smoke exposure. The drop in the smoking rate among women of childbearing age from 40 % (2003) to less than 30 % (2005) is a result of the carefully targeted prevention measures that were addressed particularly to young women and families. The decrease in the smoking activity of 12- to 17-year olds to 20 % represents the achievement of a key political objective. The drug and addiction council has set a target of reducing the smoking rate in this age group to below 17 % by 2008. Initial studies have shown that there has already been a decline in smoking among school pupils younger than 14 (see for example, the school bus study carried out in Hamburg in 2006).

Despite these successes, it remains important to continue the activities in order to reduce the health risk to the public from active or passive smoking. The major activity that is imminent here is the implementation of legislation at state and federal level to improve protection of non-smokers.

¹The generic term VOC emissions (VOCs = Volatile Organic Compounds) covers a number of volatile organic compounds such as halogenated hydrocarbons, alkanes/alkenes, aromatics, terpenes, esters, aldehydes and ketones. Generally, when describing VOC emissions, a distinction is made between methane and non-methane VOCs (NMVOC, Non-Methane Volatile Organic Compounds).

²The Geneva Convention is based on the Final Act of the Conference on Security and Cooperation in Europe (CSCE) of 1975, which cites environmental protection as one of the fields of cooperation.

³The Commission on Indoor Air Quality advises the President of the Federal Environment Agency on all matters of indoor air hygiene. The members of this commission are appointed by the President for a term of three years. They come mainly from scientific institutions in Germany and state-level agencies with responsibility for technical aspects of indoor air hygiene. Membership of the Commission on Indoor Air Quality is non-remunerated. Apart from professional members, representatives of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the Federal Ministry of Health and the Federal Ministry of Transport, Building and Urban Affairs, and the Federal Environment Agency take part in the meetings. Additional guests are invited as experts when necessary.

⁴The Committee for Health-related Evaluation of Building Products ("AgBB") is a committee composed of representatives of the German states; it was set up in 1997 by the highest state agencies responsible for building ("ARGEBAU") and for health protection ("AOLG"); its secretariat is at the Federal Environment Agency. Federal agencies, such as the Federal Institute for Materials Research and Testing ("Bundesanstalt für Materialforschung und -prüfung") and the Federal Institute for Risk Assessment ("Bundesinstitut für Risikobewertung, BfR") also work in the Committee. AgBB's work has focused mainly on developing a scheme applicable to a health-related evaluation of VOC emissions from building products, known as the AgBB evaluation scheme. It provides a good basis for initiating measures under Article 17 of the Chemicals Act, which provides for bans or restrictions to be imposed on certain dangerous substances or products containing or liable to release such substances and also a good additional basis for proposing measures within European work on existing chemicals.

⁵"WaBoLu" stands for "Wasser, Boden- und Lufthygiene" (water, soil and air hygiene).

5. CEHAPE-RPG III

Additional information:

Act on Food, Feedstuffs and Consumer Products: <http://bundesrecht.juris.de/lfgb/BJNR261810005.html>

Action Programme Environment and Health (APUG): <http://www.apug.de>

Biocides Act: <http://www.bmu.de/chemikalien/biozide/biozidgesetz/doc/6904.php>

“Blue Angel” eco-label: <http://www.blauer-engel.de>

Building Products Act: <http://bundesrecht.juris.de/baupg/index.html>

Chemicals Act: <http://bundesrecht.juris.de/chemg/index.html>

Conference of Health Ministers (GMK): <http://www.gmkonline.de>

Commission on Indoor Air Quality (“Innenraumlufthygiene-Kommission, IRK”):

<http://www.umweltbundesamt.de/uba-info-daten/daten/gesundheit/irk.htm>

Committee for Health-related Evaluation of Building Products (AgBB):

<http://www.umweltbundesamt.de/bauprodukte/agbb.htm>

Detergents and Cleaning Products Act:

<http://www.umweltbundesamt.de/uba-info-daten/daten/wasch/gesetze.htm>

Environmental quality data and ozone forecasts: <http://www.env-it.de/luftdaten/start.fwd>

European Chemicals Regulation (REACH): <http://www.reach-info.de/>

Federal Centre for Health Education (BZgA): <http://www.bzga.de>

Federal Environment Agency (UBA) (air and air quality): <http://www.umweltbundesamt.de/luft/index.htm>

Federal Immission Control Act (BImSchG): <http://bundesrecht.juris.de/bimschg>

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (air quality):

<http://www.bmu.de/luftreinhaltung>

Federal Ministry of Health (BMG): <http://www.bund.bmg.de>

German Environmental Survey for Children (GerES IV):

<http://www.umweltbundesamt.de/survey/us03/uprog.htm>

Infection Protection Act: <http://bundesrecht.juris.de/ifsg/index.html>

National Cycling Plan: www.nrvp.de

Ordinance on bans and restrictions of dangerous substances (ChemVerbotsV):

<http://www.gesetze-im-internet.de/chemverbotsv/index.html>

Plant Protection Act: http://bundesrecht.juris.de/pflschg_1986/index.html

Smoke-free information portal of the Federal Centre for Health Education (BZgA):

<http://www.rauchfrei-info.de/>

Youth Protection Act: <http://www.bmfsfj.de/Kategorien/gesetze,did=5350.html>

6. CEHAPE - Regional Priority Goal IV: Prevention of illness caused by chemicals, physical and biological agents and by hazardous working environments

6.1 Introduction

Chemicals, physical and biological agents and hazardous working environments can be associated with risks to human health. The objective of WHO's Children's Environment and Health Action Plan is to prevent as far as possible any adverse effects on health that these influences might cause in unborn children and children of all ages, including newborn and premature infants and adolescents. A further aim is to reduce all forms of childhood cancer and the incidence of melanoma and other forms of skin cancer in later life. Numerous measures and activities have been put in place in Germany to achieve these goals.

Special consideration must be given to children when assessing risks. A research project revealed that many procedures for assessing risk and setting standards take susceptible groups such as children into account. For example, it is common regulatory practice when setting guideline or limit values for environmental media and food on the basis of data acquired from animal testing to take account both of the difference between species – between rats and humans for example – and differences within the human population. A default factor of 10 per each of these extrapolations (total of 100) is seen as adequate to take account of these differences, including individual differences with-

in the most susceptible age group. Default factors must be used whenever there is no empirical evidence to indicate the specific susceptibility of groups, especially children, that might justify the use of a smaller or greater extrapolation factor.

For the protection of children from radiation, age-specific habits and special characteristics of physical build and metabolic processes are taken into account. In some cases, the guideline and limit values for radioactive substances in baby food are set lower than those for adult food on precautionary grounds.

In some cases children are given special consideration due to higher exposure. For example, the Commission on Indoor Air Quality ("Innenraumlufthygiene-Kommission, IRK") at the Federal Environment Agency ("Umweltbundesamt, UBA") sets guideline values for certain substances that occur in indoor air (see 5.3). Children are usually taken account of by an additional safety factor of 2 due to their relatively higher respiratory minute volume.

Prevention of illnesses caused by physical agents is one of CEHAPE's major goals. Long-term high levels of noise – from sources including roads, railways, airports, sports facilities

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and neighbourhood activities – are a health risk and can have an adverse effect on health of varying severity.

6.2 Chemical safety

Chemicals are part of everyday life; they perform so many useful functions in the workplace and the home. Whether there are risks associated with chemicals depends on the properties of the particular substance and the level of exposure. If necessary, proposals for reducing the risk, by introducing restrictive measures for example, are made on the basis of a risk assessment.

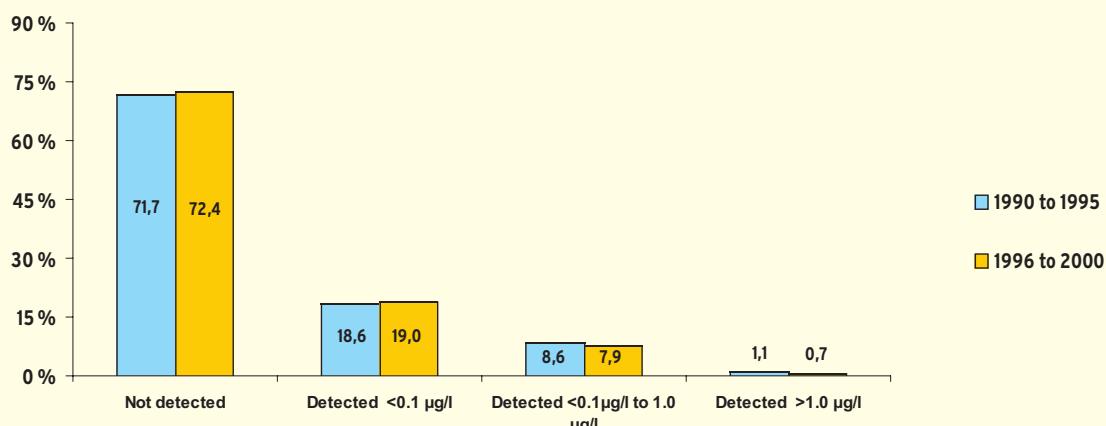
In order to be able to evaluate risks to human health and the environment, comprehensive studies on the effects in human beings and the environment must be available, along with a description of the exposure situation. The data situation for many substances, particularly existing chemicals, is currently patchy and does not allow sufficiently precise evaluations to be made. An improvement in the situation is expected from the EU's new chemicals policy REACH¹ coming into force.

Well-tested substances such as lead, polychlorinated biphenyls (PCBs), methyl mercury, arsenic and toluene, for example, have been proven to be toxic to the developing brain of unborn children, babies, toddlers and children.

Some chemical substances that were produced in the past in high volumes, such as PCBs, flame retardants or certain musk compounds, have accumulated in the environment and have been detected today in breast milk and sometimes in children's blood and urine. Most of these substances have now been banned in Germany and Europe, but they can still find their way into Germany in contaminated food or consumer products.

Plant protection products can cause problems for humans and the environment because their effect is not limited to the pathogens and plant diseases they are used to combat. Some plant protection products come under the POPs Convention² (Stockholm Convention). POPs are substances with persistent, bioaccumulative and toxic properties. They can enter the organism via the food chain. The production, placing on the market and use of these plant protection products are banned. The plant protection product DDT is an exception, although its use is also banned in Germany. Under the provisions of the EU's Plant Protection Products Directive, plant protection products with persistent, bioaccumulative and toxic properties will no longer be authorized in the European Union.

Figure 11: Pesticide levels in ground water in Germany from 1990 to 1995 and 1996 to 2000



Source: BMU 2006

► Measures and activities on chemical safety

Legal provisions

The general legal basis for dealing with chemicals in Germany is the Chemicals Act ("Chemikaliengesetz, ChemG"). The purpose of the Act is to identify dangerous substances, avert risks, and prevent them from occurring with the aim of protecting humans and the environment from any harmful effects. Substances and preparations are also classified under dangerous substances legislation and labelled with "Indications of danger" (R phrases³). This classification system is uniformly used across all the EU Member States.

Since chemicals can get into surface water, they are also tested under the Federal Water Act ("Wasserhaushaltsgesetz, WHG") to establish if they are hazardous to water and classified in water hazard classes. Depending on the water hazard class, safety precautions of varying severity have to be complied with when handling these chemicals.

The licensing and use of plant protection products are also subject to stringent legal requirements. Basically only licensed plant protection products may be used, and then only on land used for agricultural, forestry or horticultural purposes. The licensing of a plant protection product for a user remains the responsibility of the individual Member States, so that not all plant protection products that are licensed in Europe are necessarily recognised in Germany. Licenses in Germany are dealt with by the Federal Office of Consumer Protection and Food Safety ("Bundesamt für Verbraucherschutz und Lebensmittelsicherheit, BVL"). Applications from manufacturers must include details of chemical and physical properties. The Federal Biological Research Centre ("Biologische Bundesanstalt") reviews specific issues relating to the intended effect, residue behaviour and degradation. The Federal Institute for Risk Assessment ("Bundesinstitut für Risikobewertung, BfR") evaluates the effects on human health and recommends maximum residue levels; the Federal Environment Agency gives an opinion on ecological matters.

One of the aims of the German Plant Protection Act is to avert possible risks for human health,

animals and the natural world arising from the use of plant protection products. The Regulation Governing the Use of Plant Protection Products ("Pflanzenschutz-Anwendungsverordnung") provides for bans on the use of and restrictions on particular active substances.⁴ Aspects of plant protection are also found in numerous other pieces of legalisation, including the Chemicals Act, the Federal Immission Control Act ("Bundesimmissionsschutzgesetz, BImSchG"), the "Dangerous Goods Ordinance" ("Gefahrgutverordnung"), the Waste Management Act ("Abfallgesetz") and the Bee Protection Ordinance ("Bienenschutzverordnung"). The Federal Nature Conservation Act ("Bundesnaturschutzgesetz") also indirectly regulates aspects of plant protection products in drinking water.

In December 2006, EU Environment Ministers in Brussels adopted the Chemicals Regulation REACH, which will come into force on 1 June 2007. It represents a change of paradigm by comparison with the EU's 1993 programme on existing chemicals, under which only 117 of about 30,000 environmentally relevant chemicals that were on the market were dealt with. REACH is intended to ensure that all substances relevant to the market are examined within a reasonable time in terms of danger to health and the environment. Whereas to date it was the duty of the government agencies to identify individual critical substances, require submission of data and evaluate that data, the introduction of REACH will see that responsibility transferred to manufacturers and importers. Under REACH, all substances that are produced or imported in volumes in excess of one tonne per year per manufacturer have to be registered with a central EU agency accompanied by a defined set of information. There is a statutory timetable within which this has to be done – between three and eleven years after the REACH Regulation enters into force. Dangerous substances that are carcinogenic, mutagenic or teratogenic and those that are persistent, bio-accumulative and toxic or very persistent and very bio-accumulative (even if they are not toxic) will be subject to an authorisation procedure. The Chemicals Agency will make non-confidential information about substances and their dangers available in an internet database.

There are currently two international conventions designed to reduce POPs: the POPs Convention (Stockholm Convention), which came into force in May 2004, and the POP Protocol to

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the Geneva Convention on Long-range Trans-boundary Air Pollution, dating from 1998. The Stockholm Convention lists the twelve most harmful POPs; under this Convention the manufacture, use and trade in these substances is largely banned. Both conventions not only require identified POPs to be banned and minimisation measures put in place, they also make provision for other similar substances to be incorporated into their scope. Recently for example, interest has focused on brominated fire retardants and perfluorinated compounds, such as perfluorooctanesulfonate (PFOS), which has been found by the Environmental Specimen Bank ("Umweltprobenbank") in the blood of young people in Germany. In Germany – as in most industrialised countries – the production and use of POPs are already banned or highly regulated. The main emission sources for undesirable by-products, such as waste incineration facilities, are statutorily obliged to comply with stringent limit values, so that health risks and danger to the environment are minimized. However, the less economically developed countries pose a problem in this respect. To address this Germany has, in the last 15 years, put over 350 million euros into about 150 development cooperation projects within its programme of capacity building in the chemicals sector.

As part of a philosophy of preventive environmental and health protection, before being placed on the market, all biocidal products are subject to an authorisation procedure that is standardised throughout the EU. Older biocide active substances and products that were already on the market before May 2000, will undergo systematic review up to 2010. In the long term this will lead to the most dangerous biocide active substances being replaced by others from which no unacceptable effects on the environment and health are to be expected provided they are used properly. Improved labelling regulations for biocidal products, a ban on advertising that plays down the risk associated with them and duties to provide information for use in possible cases of poisoning will also improve the quality of information provided to consumers, enabling them to make an informed choice about buying and using these products. A precondition for the authorisation of biocidal products in Germany is that the active ingredients they use have been tested at EU level and – as is the case with plant protection products – have been included on a “positive list of permitted active substances”.

Studies of pollutant burdens

The German Environmental Survey for Children (GerES IV) conducted by the Federal Environment Agency is making a contribution to a successful policy on chemicals in Germany and Europe, in that it facilitates the identification of body burdens of pollutants, especially in children, along with the possible sources of those pollutants (see 1.4).

A study carried out by the Federal Environment Agency and the Federal Institute for Risk Assessment investigated levels of flame retardants in breast milk, paying particular attention to polybrominated diphenyl ethers (PBDE).⁵ The study looked at what PBDE concentrations occur in human breast milk in Germany, what quantities are ingested by breast-fed babies and what factors have a particular influence on the level of PBDEs found in humans. A total of 128 breast milk samples taken from 89 mothers across Germany were analysed. This number of samples makes the study one of the most extensive investigations of PBDE levels in human breast milk in the world. The outcome of this study was that the Federal Environment Agency and the Federal Institute for Risk Assessment have come to the conclusion that today's level of knowledge does not suggest that PBDEs in breast milk poses a risk for babies. By comparison with other European countries, PBDE levels in breast milk in Germany tend – with an average of 2.4 ng/g fat (in women eating a non-vegetarian diet) – to be more in the lower range. By comparison, current information from Canada and the USA shows that levels there are many times higher than European ones.

Studies designed to survey pollutant levels are also being carried out at state level. Schleswig-Holstein's duplicate study on total intake of PCBs in young women and the state-wide breast milk programme can be cited as examples here. In the duplicate study, young women's individual daily dietary intake of PCBs and other POPs was investigated in 1997 and 2003. The findings showed that, by comparison with 1997, the food samples from 2003 had lower levels of PCBs, DDT and HCBs. The levels found in the food matched the accumulated contaminant levels in the breast milk. Levels in breast milk were ascertained in a separate programme that has been running since 1985, which provides current data on body burdens of pollutants in young women. Consolidating the data from the duplicate study with the data

from the breast milk monitoring programme has made it possible to carry out a plausibility assessment for intake through food and to estimate the half life of individual PCB congeners.

Findings of studies carried out as part of the Sentinel Public Health Offices project in Baden-Württemberg show that internal pollutant levels in recent years have in most cases decreased and for the majority of children are in the range of not harmful to health. In individual cases markedly high levels of mercury were identified, the majority of which could be traced back to the use of skin-lightening creams containing mercury. Similarly isolated cases of high levels of lead were found. There has been a significant decline in internal levels of organochlorine compounds in children in Baden-Württemberg in the last 15 years. In the case of heavy metals, a decline was observed mainly in mercury in urine and to a lesser extent in lead in blood. The main influencing factor for the levels of mercury in children turned out to be the number of amalgam fillings in their teeth, which has also dropped markedly over the last decade. Overall the studies showed that location was only a minor influence.

The federal and state agencies have produced educational brochures as one way of helping consumers reduce their use of chemicals in everyday life. The "Blue Angel" eco-label provides help in choosing to buy products that are environmentally sound and not harmful to health. It indicates, for example, which products for interior furnishings and decoration – such as paints, varnishes, furniture, floor coverings, adhesives and mattresses – have particularly low emissions and are therefore less likely to cause health problems than other products (see 5.3).

► Outlook

In terms of environmental policy, Germany's record on chemical safety is a positive one. In many environmental media, such as water, soil and air, and in the human organism, concentrations of poorly degradable organochlorine compounds such as polychlorinated biphenyls (PCBs) and dioxins have decreased. First-generation pesticides, such as DDT, aldrin, dieldrin and toxaphene have been replaced by effective substances that are more readily degradable, so that cases of maximum residue levels being ex-

ceeded are now rare.⁶ The possibility of heavy metals entering the environment has now been drastically reduced – for example as a result of the 1971 Lead in Petrol Act ("Benzinbleigesetz, BzBIG") and its follow-up legislation. The EU's new chemicals policy REACH will create the conditions needed to ensure safe use of chemicals.

6.3 Protection against radiation

Increased radiation exposure levels can be a hazard for the environment and human health. That is why two of the environmental health objectives under Regional Priority Goal IV of CEHAPE are to protect babies, infants, children, and adolescents against ionizing and non-ionizing radiation. Exposures to ionizing radiation can originate from x-ray use in medical care, from the use of nuclear energy, and from increased natural radioactivity, for example from radon. Ionizing radiation has a high energy, which can directly ionise molecules and cause free radicals in the body, which then can result in genetic changes and cancer. Radon is a radioactive noble gas that can occur in high indoor concentrations. It is the most frequent cause of lung cancer after smoking. Some 1,900 of the almost 40,000 deaths from lung cancer in Germany every year are attributable to radon.

As a result of technical progress, the population is exposed to increasing levels of non-ionizing radiation, particularly low-frequency fields from power supplies and high-frequency fields from wireless communication networks. The expansion of mobile telephone networks in Germany, particularly the introduction of UMTS (Universal Mobile Telephone System) technology, has given rise to considerable public debate of potential risks from communication technologies. These include the risk of cancer, cardiovascular disease, or subjective health complaints. Scientific studies on potential risks of new technologies have so far not led to final conclusions under all aspects. Based on health effects that have been documented to this point, limit values have been specified which guarantee protection of the population according to the current state of scientific knowledge.

Modern leisure activities, which involve spending a great deal of time in the sun and a more frequent use of tanning beds, have increased

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the exposure to ultraviolet (UV) radiation. UV radiation can have many detrimental effects on health. Excessive radiation can cause sunburns, inflammations of the eye, and allergic reactions. Long-term damage from UV radiation can include skin cancer and cataracts. UV radiation can also have a negative effect on the immune system.⁷ Babies, infants, and children require special protection, since their skin is more sensitive than that of adults.

Many measures and initiatives have been launched in Germany to protect babies, children, and adolescents against ionizing and non-ionizing radiation and to increase general awareness of the risks from radiation.

► **Measures and activities to protect against radiation**

Ionizing radiation

The population in Germany is protected against increased exposures to ionizing radiation by dose limits. These have to be obeyed for all age groups. Dose limits are applicable to the emissions from nuclear power plants during normal operation and during the planning phase of nuclear installations to protect against potential exposures in cases of nuclear accidents. In addition to compliance with dose limits, the German Radiation Protection Ordinance ("Strahlenschutzverordnung") requires all exposure to radiation or contamination of people and the environment to be optimized – even below exposure limits – in accordance with the state of the art in technology and scientific knowledge and taking into account all the circumstances of each individual case.

The special characteristics of children are explicitly taken into account when assessing exposure levels to radiation. For example, the German Radiation Protection Ordinance takes into consideration the customary diet at each age. Particularly the consumption of breast milk by babies is taken into account, because after ingestion or inhalation of radioactive substances by a nursing mother before or during the nursing phase the radionuclides can be passed on to the baby in mother's milk.

The German federal government has developed models to assess the transmission of radioactive substances from the mother via breast milk to the baby. The guiding principle is to avoid any risk to the baby by underestimating exposure to radiation. The applicable calculation parameters take into account age-specific characteristics, such as customary diets and dose coefficients.

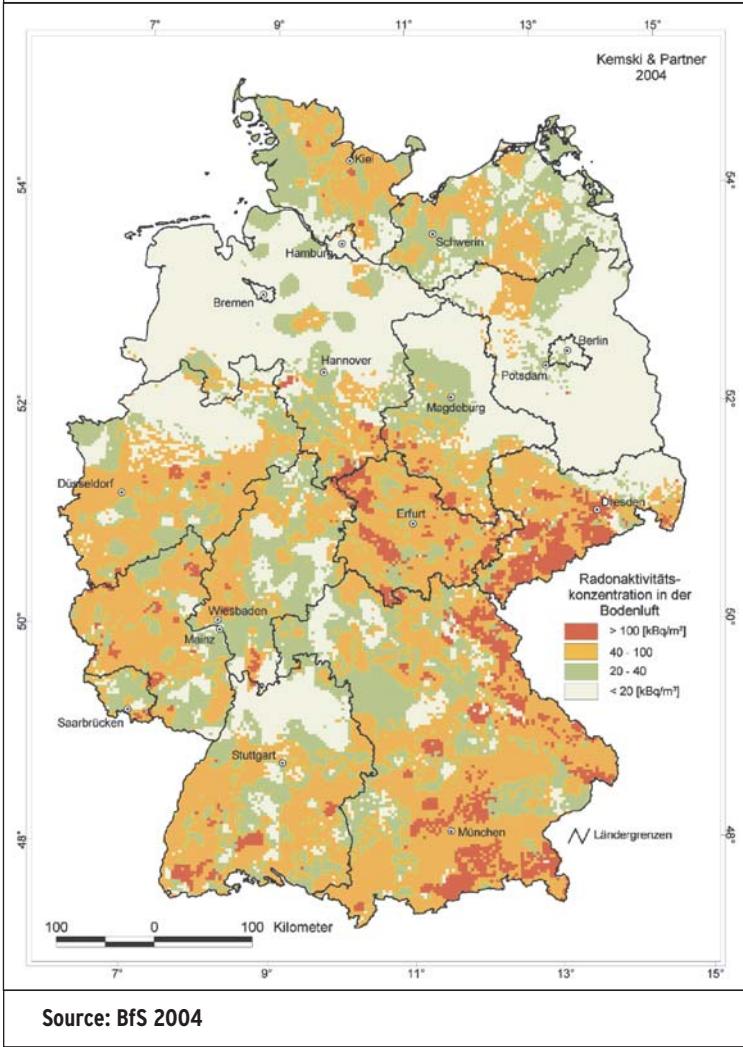
Patients undergoing medical diagnostic procedures in radiology and nuclear medicine are protected against increased radiation levels by diagnostic reference values. Values are given for frequent and radiological applications with high exposure levels. These diagnostic reference values must not be exceeded without a good medical reasoning in radiology and must be strictly followed in nuclear medicine. Diagnostic reference values were specified and published by the German Federal Office for Radiation Protection ("Bundesamt für Strahlenschutz, Bfs") in 2003. Children are also included in the specification of diagnostic reference values for paediatric x-ray studies and weight-based conversion factors.

The German Radiation Protection Ordinance also protects the unborn by specifying that the intrauterine dose for women of child-bearing age who are exposed to radiation in the workplace may not exceed 2 mSv (millisieverts) in a year. The dose for unborn children from external and internal exposure to radiation may not exceed 1 mSv from the time a pregnancy has been declared until it ends. An unusual aspect of internal radiation exposure in women is that for specific radionuclides an intake before a woman becomes pregnant can lead to significant doses for a child that is conceived later. How this knowledge will be included in legal provisions is currently under investigation.

Comprehensive measurements taken since the 1980's have shown high radon levels in soil air in certain regions in Germany, which is due to radon emanation from underground rock. The first assessment of the representative distribution of radon concentrations in German housing was done in late 2005. Based on that distribution and the most recent risk estimates for radon induced lung cancer, it was calculated that about 5 % of lung cancer cases that occur every year in Germany are caused by indoor radon; that is approximately 1,900 deaths from lung cancer each year. Due to the high health risk from indoor radon, the German Federal

Government has developed a strategy to reduce indoor radon concentrations in occupied spaces, which aim not only at eliminating peak levels but also at general reduction of indoor

Figure 12: Map of radon concentrations in soil air 1 m below the surface basing on data of September 2003



radon levels. Starting with an exposure level of 100 Bq/m³, it is recommended to undertake remediation measures even in existing buildings, staggered over time based on radon concentration. The manual "Radonhandbuch Deutschland", which was published in 2001, provides an overview of current remediation measures and how effective they are.

Non-ionizing radiation

The 26th Ordinance Implementing the German Immission Control Act ("Verordnung zur Durchführung des Bundesimmissionsschutzgesetzes, BImSchV") has been in force in Germany since 1997. This Ordinance on Electromagnetic Fields ("Verordnung über elektromagnetische Felder") sets limit values for commercially operated fixed installations for low-frequency fields used for the supply of rail lines and electric power in general, as well as for high-frequency fields, for example mobile telephone base stations.

In 2001 the German Radiation Protection Commission ("Strahlenschutzkommision, SSK")⁸ evaluated the current level of knowledge concerning the potential health effects of electric, magnetic, and electromagnetic fields below current limit values. In its recommendation on protecting the population against electromagnetic fields ("Grenzwerte und Vorsorgemaßnahmen zum Schutz der Bevölkerung vor elektromagnetischen Feldern") it noted that the current limit values provide reliable protection against known risks. To resolve unanswered questions, it recommended intensifying research activities as a precautionary measure. In response, the German Federal Government initiated the "Deutsche Mobilfunk Forschungsprogramm", a mobile telephony research programme that is scheduled to complete its work early in 2008.

The programme is carrying out several projects that will investigate potential risks for children and adolescents. For example, a population-based cross-sectional study is analyzing the relationship short-term subjective well-being (self-rated) and exposure to mobile telephone fields (measured using personal dose meters) in 1,500 children between ages 8 and 12 and 1,500 adolescents between ages 13 and 17. Another epidemiological study will explore the risk of childhood leukaemia in the vicinity of high-power television and radio transmitters.

To reach out to adolescents, the age-specific information brochure "Mobile phones: Just how do they work?" ("Mobilfunk: Wie funktioniert das eigentlich?") was published in 2003. It contains practical guidance on avoiding radiation when using mobile phones, including using mobiles with low levels of radiation. The "Blue Angel" jury developed the environmental label for low-exposure mobile phones in 2003.

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Teaching materials on mobile phones have been made available to school children of year 5 and above since spring 2006. Because most school children of this age in Germany are already familiar with mobile phones and often have their own mobile phones, they need early background information on aspects related to radiation protection.

The results of epidemiological studies, particularly on childhood leukaemia, indicate the need for further studies of low-frequency fields. So far, however, experimental studies have not confirmed a relationship between health risks and weak low-frequency fields (below current limit values).

The German Federal Office for Radiation Protection has been operating a national UV measurement network on behalf of the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety ("Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, BMU") since 1993. To make its daily report, at around noon the measurement centre retrieves current UV data from nine other affiliated stations and provides the information to the public. From April to September three-day UV forecasts are also issued for northern, central, and southern Germany, making a major contribution to the avoidance of UV exposure and to risk communication.

Also in connection with UV radiation, gaps in knowledge about issues such as the mechanism involved in the origin of skin cancer are being filled by funding research projects. Over the last few years, several studies have shown a connection between excessive UV exposure during childhood and a later risk of skin cancer. Public relations work by the German federal government is emphasizing information campaigns about the risk of UV radiation for the target groups of children and adolescents, as well as for parents and others who care for children. Age-appropriate brochures have proven successful in this area, too.

In January 2002, the Federal Office for Radiation Protection created a round table on tanning beds with the objective of specifying uniform criteria for a minimum standard to protect customers against excessive UV exposure levels and therefore the high health risks of tanning beds. Participants from scientific and state institutions, as well as representatives of tanning studio operators and manufacturers of

tanning beds, have reached agreement on the criteria and the fundamental procedure for certification of tanning studios. The main criteria for certification are defined standards for equipment with limits for UV radiation and testing requirements, as well as uniform operating procedures related to hygiene and occupational health and safety. The technical qualification of employees who deal with customers and the scope of information and advice offered to customers are also specified.

► Outlook

Strict dose limits and diagnostic reference values protect the population in Germany against increased exposure levels from ionizing radiation as a result of the use of nuclear energy and medical care, respectively. The control of indoor radon levels will be one of the greatest challenges in the future. The German federal government wants to ensure sufficient protection against radon, at least during planning and constructing new buildings. Over the longer term, radon levels in existing structures also have to be reduced.

To reduce the risks to health as a result of non-ionizing radiation, the German federal government will carry out additional measures for the benefit of the public in the future. For example, the further development and provision of teaching materials on the risks of UV radiation and mobile telephones is planned. In spite of broadly based educational activities on known risks to health, the popularity of UV with consumers – including the use of tanning beds – in Germany is increasing constantly. A policy of providing more information targeted to specific groups is therefore needed.

6.4 Noise protection

People in Germany feel that noise is one of the environmental stresses that affects them most. In a representative survey on environmental awareness in Germany conducted in 2006, ("Umweltbewusstsein in Deutschland 2006"), 63 % of respondents stated that they feel disturbed and annoyed by road traffic noise in their immediate environment. Other sources of noise that often cause a disturbance are noisy

neighbours, aircraft, industry and trade, rail traffic and noisy sports.

In the case of children and adolescents, the main problem is noise from leisure activities and its effects. Noisy toys, fireworks, portable music players, visits to discos and other noisy events affect hearing and can cause permanent damage. Noise can also reduce performance – including children's learning capacity.

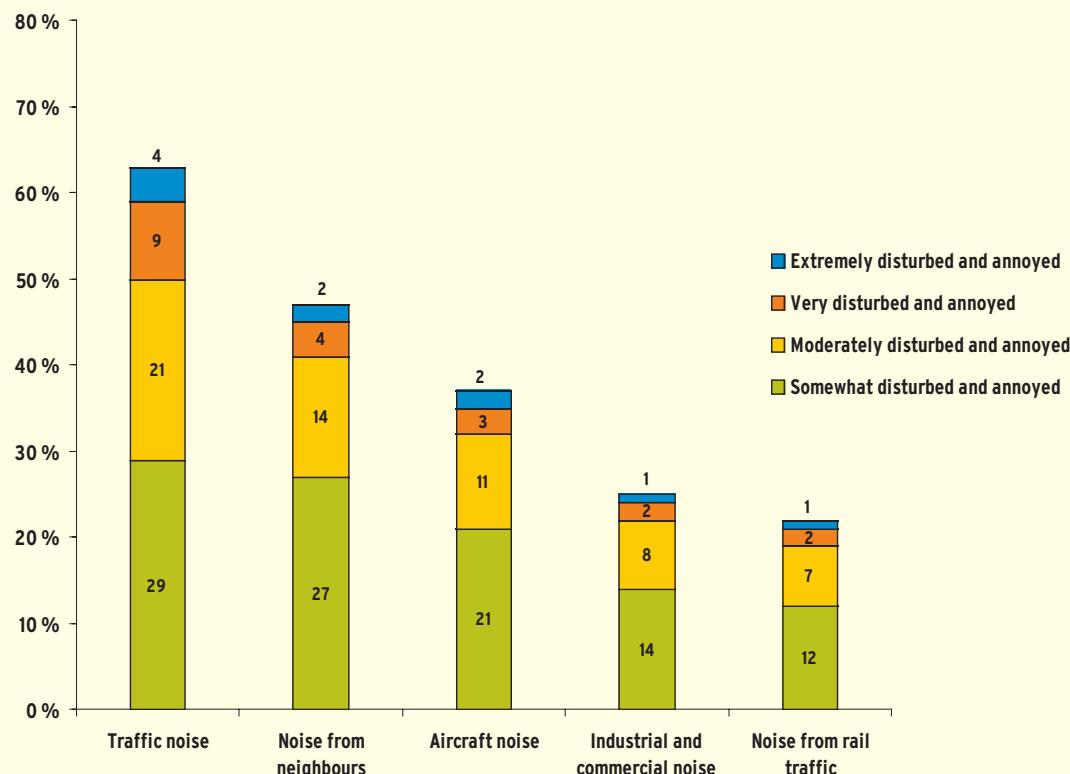
In its German Environmental Survey for Children (GerES IV), the Federal Environment Agency studied the noise exposure and effects of noise during the leisure time of 1,000 children aged between 8 and 14. To do this they carried out hearing tests in the children's homes. It was shown that around 13 % of the children studied had a hearing loss of more than 20 dB(A) at least one test frequency, and that 2.4 % had a loss of more than 30 dB(A). According to the study, noise exposure has already impaired or damaged the health of some members of the young generation (see 1.4).

Noise not only affects our hearing, it can also have a negative impact on the cardiovascular system. According to a study carried out by the Federal Environment Agency, about 4,000 heart attacks could be attributable to road traffic noise. Another study has shown that people exposed to night-time aircraft noise visited their doctors more frequently and were prescribed higher than average levels of medication to treat cardiovascular diseases and depression.

► Noise protection measures and activities

There are numerous legal regulations on noise protection in Germany – separated according to the different types of noise or sources of noise. An important general measure to improve noise protection in Germany is the EU's Environmental Noise Directive (2002/49/EC), which was transposed into German law in 2005. Under this Assessment and Management of Environmental Noise Act ("Gesetz über die Bewertung und Bekämpfung von Umge-

Figure 13: Nuisances caused by noise in the living environment



Source: BMU 2006: Representative survey on environmental consciousness and environmental behaviour in 2006

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bungslärm”), the competent authorities will have to develop noise maps for all main roads and railway lines, major airports and agglomerations. The purpose of the maps is to inform the public and at the same time they will form the basis for noise action plans, which the responsible authorities – with the participation of the public – are obliged to draw up for areas with noise pollution. The plans will set out measures to prevent or reduce environmental noise. They are also intended to protect quiet areas from any increase in noise. The states are responsible for the concrete implementation of the Directive. The new Act, which implements the EU Environmental Noise Directive, has made noise abatement plans an efficient instrument for combating noise.

Noise reduction is also an important part of the German federal government's transport research programme. After traffic prevention, quieter aircraft, motor vehicles, tyres and road surfaces are the most efficient and long lasting methods of noise reduction. The federal government is striving on the national, European and international level to achieve a technologically feasible tightening up of limit values for noise. In conjunction with the “Quiet Traffic” (“Leiser Verkehr”) research association, it is promoting the development of quieter transport technologies and thus laying a foundation for limit values that is in line with the latest state of the art.

Following a brief overview is given of the different legal regulations and measures at both federal and state level designed to protect the public from road traffic noise, rail traffic noise, aircraft noise and noise from leisure activities. Particular attention is paid to protecting children and adolescents from noise pollution – especially during leisure time and in educational facilities.

Road traffic noise

Road traffic is the most significant source of noise in Germany. For that reason, efforts to reduce road traffic noise are one of the German federal government's priorities. Apart from traffic planning and pricing measures, which aim to reduce traffic and achieve a modal shift, legislation and measures to reduce noise at source are a particular focus of attention here, since they provide a sustainable and usually

cost-effective way of reducing environmental noise.

The limit values for noise from motor vehicles are set by the European Community as requirements that new vehicles have to comply with. EU directives, which have been incorporated into the German Road Traffic Licensing Regulations (“Straßenverkehrs-Zulassungs-Ordnung, StVZO”), stipulate measuring procedures and limit values for vehicle noise emissions. Since 1980 noise emission requirements have been tightened up in three stages. In 1996 the limit value for noise from passenger cars was lowered by 3 dB(A) to 74 dB(A). The German federal government is advocating further reductions in connection with the development of the new noise measuring procedure.

Tyre/road noise is a major part of overall noise emissions from motor vehicles. In June 2001, the European Union set limit values for noise from tyres for the first time. In Germany particularly low-noise tyres can be labelled with the “Blue Angel” eco-label – indicating that they are low-noise and fuel-saving. The requirements for the eco-label are also intended to form an important basis for the necessary tightening of noise limit values for tyres at European level. Another effective way of reducing road noise is low-noise road surfaces – in the form of porous asphalt. New variations on this type of road surfacing reduce the noise levels on carriageways by about 7 dB(A) by comparison with normal mastic asphalt.

However, reducing noise through technical improvements to vehicles and roads is usually not sufficient. The aim of the German federal government's environmental policy is therefore to take appropriate additional measures to protect everyone who lives at a busy road from unreasonable noise levels.

The Traffic Noise Prevention Ordinance (“Verkehrslärmschutzverordnung, 16th BImSchV” of 12 June 1990) sets noise standards for new public highways and rail tracks for trains and trams in order to protect the neighbourhood from traffic noise. The noise standards are most stringent near schools. Right from the planning stage, a sufficient distance between the road and any buildings to be protected from noise – residential buildings, schools and hospitals, for example – must be respected. If this is not possible, protection of the neighbourhood must be guaranteed by installing

noise barriers such as walls or earth mounds and, if necessary, other protection measures, such as sound-insulated windows.

The statutory noise protection regulations for new roads do not apply to existing roads. However, for some time now, a noise abatement programme for existing motorways and major roads has been running; its provisions include installing noise barriers, such as earth mounds, walls or noise protection measures in residential buildings when threshold values are exceeded. For existing roads the German states and local authorities run a variety of different noise abatement programmes.

The range of transport planning measures available to reduce road traffic noise is similarly very extensive. It includes transport and development planning measures – such as promoting pedestrian and cycle traffic, traffic law – such as designating 30 k.p.h. zones – and also pricing policies to promote traffic prevention and modal shifts. At both federal and state level, overall progress in protecting the public from noise has been made in road traffic planning in recent years.

Promoting cycle traffic prevents unnecessary noise from being generated and improves the conditions needed to ensure the safe use of bicycles as a means of transport – particularly for children and adolescents. The National Cycling Plan (“Nationaler Radverkehrsplan”) introduced by the Federal Ministry of Transport, Building and Urban Affairs (“Bundesministerium für Verkehr, Bau und Stadtentwicklung, BMVBS”) aims to increase the proportion of cycle traffic. The objective is to coordinate pedestrian, cycle and car traffic and public transport in urban residential areas in a way that makes it possible to enjoy both living in a quiet neighbourhood and good mobility. Cycling is also becoming a more significant part of leisure traffic. Since 2002 the German federal government has made about 100 million euros per year available to expand the network of cycle paths at federal roads.

Rail traffic noise

The German federal government is particularly keen on promoting rail transport due to its environmental advantages in terms of land and energy use. The concern to shift more freight

and passenger transport to the railways is linked with the objective of making railways perceptibly quieter. In 1999, the German federal government presented a noise protection programme for areas near existing railway lines. Funding for this has doubled in recent years. The money is available for noise abatement measures directly on the tracks, for noise barriers and sound-insulated windows. For construction of new tracks and major modifications to existing rail tracks, the provisions of the Traffic Noise Prevention Ordinance (16th BImSchV) apply in the same way as they do to road traffic.

The European Commission has introduced noise limit values both for new freight wagons and passenger carriages and for locomotives and multiple unit trains. They have been in force since June 2006. Limit values for high-speed trains came into force back in late 2002. This has made for quieter rail traffic. In the long-term this removes a huge strain from the population – particularly for people who live near railway lines with night-time freight transport. But in the short term, measures are also needed on the vehicles already in service. Noise-reduction modifications to particularly noisy freight wagons are an urgent priority.

Aircraft noise

In recent decades noise emissions from individual aircraft have decreased significantly. In 2006, the International Civil Aviation Organisation (ICAO) increased the stringency of international noise limits for civil aircraft. Against the backdrop of the massive growth in air traffic forecast, it is vital that efforts be made on the international level to ensure that the stringency of noise limits are increased further if excessive noise annoyance to the public is to be prevented.

The fundamental amendment to the German Aircraft Noise Act (“Gesetz zur Verbesserung des Schutzes vor Fluglärm in der Umgebung von Flugplätzen, FluglärmG”), which was passed by the Bundestag in December 2006, its original version dates back to 1971, provides for better protection from aircraft noise for residents living near major airports. The amended act aims to balance the interests of the aviation industry against the noise protection interests of residents living near airports. It provides for

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a significant lowering of limit values for the determination of noise protection zones, the establishment of specific night-time protection zones, markedly lower limit values to apply to new airports or expansion of existing ones and restrictions on new residential developments and on building noise-sensitive facilities in areas with noise pollution.

cording to the specified areas. On the initiative of the State Working Group on Environment-Related Health Protection ("Länder-Arbeitsgemeinschaft Umweltbezogener Gesundheitsschutz, LAUG") guidelines for assessing noise generated by leisure activities are being drawn up. They will include information on ways of reducing noise and on the discretionary powers of government agencies in assessing noise.

Noise from industry and commerce

Noise from industry and commerce describes both noise from large industrial installations and from smaller craft and trade businesses; it can be noise from an entire industrial installation or smaller facilities within that installation. To protect people from harmful environmental impacts caused by noise from industrial installations the Technical Instructions on Protection from Noise ("Technische Anleitung zum Schutz gegen Lärm, TA Lärm") sets guide standards that apply to many types of facilities emitting noise. Protecting the neighbourhood from noise is of great fundamental importance.

Special protection for children and adolescents

Noisy toys, portable music players and going to discotheques pose significant health risks that can cause permanent hearing damage in children and adolescents. Going to discotheques is one of the most popular leisure activities of adolescents. The average noise level in discotheques can be as high as 110 dB(A), which is well into the range that can damage hearing, which begins at 85 dB(A).

The German Federal government, the German states and many institutions are working towards conveying the message to young people that it is possible to enjoy listening to music without endangering their health. For example, Federal Health Minister Ulla Schmidt as patron of a hearing campaign ("Initiative Hören") is working to promote an awareness of the quieter sounds of daily life. The Federal Centre for Health Education ("Bundeszentrale für gesundheitliche Aufklärung, BZgA") has produced a broad range of educational materials, making an important contribution to noise prevention and to preventing hearing damage in children. The "Radio 108,8" website, for example, aims to get children between the age of 10 and 12 interested in the world of hearing and provide them with comprehensive information on the subject.

A cross-departmental working group of German states, with the involvement of the Federal Environment Agency, presented its final report, including options for protecting the public at events (including discotheques) from noise that could cause hearing damage. Based on this report, state health ministers decided in 2005 that, from a health point of view, noise levels at events in general and music events in particular, including discotheques, should be restricted to a maximum of 100 dB(A) in areas audible to the public. This is to be achieved in a phased

Noise from sports and leisure activities

In individual cases, sports facilities may inherently hold a considerable potential for conflict since they are often located in or near residential areas. Since the Ordinance on Noise from Sports Facilities Regulation ("Sportanlagenlärmenschutzverordnung, 18th BImSchV") came into force in 1991, noise from sports facilities has been subject to detailed legal regulation. The Regulation sets a range of guide standards and cites measures that must be taken to ensure protection from noise.

In the "leisure society," noise from leisure activities is playing an increasingly significant role and leading to instances of serious conflict. Noise from leisure facilities that do not come under the scope of the Ordinance on Noise from Sports Facilities Regulation is assessed under the Noise from Leisure Activities Directive of each German state. In some cases, the Technical Instructions on Noise is consulted for guidance. The Noise from Leisure Activities Directive, which was presented in 1995 by the State Committee for Pollution Control ("Länderausschuss für Immissionsschutz, LAI"), establishes a system of guide standards that vary ac-

timetable, initially on a voluntary basis and through training programmes for owners of relevant business and event organisers and disc jockeys. If necessary, and possibly at a later stage, legislation to this field may have to be developed. Since 2006 this kind of legislation has been the sole responsibility of the states.

Back in 2004, the Federal Association of German Discotheques and Dance Clubs ("Bundesverband deutscher Discotheken und Tanzbetriebe e.V., BDT e.V.") which is a member of the German Association of Hotels and Restaurants ("Deutscher Hotel- und Gaststättenverband, DEHOGA"), introduced a "DJ driving licence". They were supported in this by the Professional Disc jockeys' Association ("Berufsverband Discjockey e.V., BVD e.V."), the responsible federal ministries and ministries in the majority of states and the Techniker Krankenkasse health insurance fund. The "DJ driving licence" is a certificate of continuing professional development that aims to bring about a change in awareness and attitude of professionals to loud music. The disc jockeys are trained in a seminar on the health effects of loud music, on acoustic and technical aspects and the legal liability situation. Over 1,800 DJs have so far acquired their "DJ driving licence" (as of: 05/2007).

Great advances are also being made in the prevention of hearing damage in children and adolescents as a result of numerous activities at state level. In Bavaria, for example, two projects "Olli Ohrwurm I and II" specifically address kindergarten and primary school children. The interactive "earaction" programme targets adolescents aged 12 and over.

In Brandenburg the State Health and Safety in the Workplace Agency ("Landesamt für Arbeitsschutz") has set up a "noise cabinet", which, amongst other things, provides information resources to support educational and project work in schools. On the initiative of – and with the participation of – this Agency, DIN standard 15905-5 was also revised. The updated version "Event-Technology – Sound Engineering – Part 5: Measures to prevent the risk of hearing loss of the audience by high sound exposure of electroacoustic sound systems" helps reduce the risk of damage to hearing and to ensure the public is better informed. The state of Brandenburg also used the joint information and prevention campaign run by the federal government, states and statutory accident insurance fund on the occasion of the "European

Health and Safety at the Workplace" in 2005 to step up its educational activities with adolescents. In this connection, the Internet portal "Down with noise" ("Schluss mit Lärm") received backing.

With its "noise package" a number of ministries and institutions in Hesse are working to improve acoustic conditions in schools. A series of pilot projects provide "noise traffic lights" to help schools in their educational campaigns to teach school pupils about the advantages of quiet behaviour. They have also produced a brochure with practical guidelines on acoustic remediation of classrooms and made it available to interested schools.

The state of Schleswig-Holstein also provides information in a brochure on acoustics in classrooms. Important background information helps to raise awareness of the problem and targets companies, institutions, and state agencies involved in planning, granting approval, building and operating schools. Practical tips point out possible ways of bringing about improvements.

Between 2003 and 2006, the state of Baden-Württemberg commissioned a number of research projects to identify the effects of noise in the school environment on the cognitive performance of primary school children. The projects aimed to record in detail the acoustic conditions in primary school classrooms and look for correlations with the performance and well-being of the children using them. The idea was to derive recommendations for the acoustic design of classrooms – based on children's actual learning environment. The results of the projects will be presented and discussed with users and stakeholders at knowledge transfer events.

Since 2005 the working panel on noise in educational facilities within the nationwide network "The New Quality of Work Initiative" ("Initiative Neue Qualität der Arbeit, INQA") has been looking at the topic of "acoustic ergonomics" in educational facilities. Through its broad range of activities and publications it is aiming to make a tangible contribution to reducing the noise pollution that children, pupils and educational staff are exposed to in schools and childcare facilities.

► Outlook

The foundation for hearing loss in adulthood is often laid in childhood through exposure to excessive noise. Protecting children and adolescents from noise is therefore one of the German federal government's special concerns. Legislation and measures on noise protection in Germany are effective instruments for protecting the health of the young generation. They include noise protection measures that everyone can take responsibility for implementing, such as avoiding loud music or wearing ear protectors. In the case of noise from leisure activities, in other words self-imposed exposure to music played at high volumes, attempts must be made to ensure that children and adolescents develop greater awareness of risk and that operators of music events and discothèques do not allow specified volumes to be exceeded.

The German federal government intends to further increase the level of protection from noise, particularly in the traffic sector. Despite past success, further research and development efforts must be made to reduce traffic noise at source.

Small-scale standalone noise-protection measures cannot in the long term ensure adequate noise protection. What is important is a comprehensive concept. For that reason, measures aimed at preventing traffic and encouraging a shift to less polluting modes of transport are gaining significance, including on reasons of noise reduction.

Environmental policymakers take the insights gained into the harmful effects of noise very seriously. It is the German federal government's aim to tangibly improve protection from noise. A benchmark for this is the recommendation of the German Advisory Council on the Environment ("Sachverständigenrat für Umweltfragen, SRU"), under which, as a short-term target, noise levels the public are exposed to should not exceed 65 dB(A) during the day and 55 dB(A) at night, in order to preclude the possibility of damage to health. Nevertheless, "severe annoyance" as defined in the Federal Pollution Control Act, which can also cause psychoneurological disorders, occurs at levels markedly below this threshold. It is therefore important in the medium-term to work towards achieving WHO's target values. To ensure children's unimpaired development, WHO's guide-

lines set maximum noise levels at 55 dB(A) for outdoor playgrounds and 35 dB(A) in classrooms.

¹REACH stands for Registration, Evaluation and Authorisation of Chemicals.

²POPs stands for Persistent Organic Pollutants.

³R and S phrases (risk and safety phrases) are warning codes assigned to hazardous elements and chemical compounds and to preparations containing them. In conjunction with hazardous substance symbols they are the most important elements in the statutory labelling system for hazardous substances prescribed by the EU.

⁴45 substances may no longer be used in Germany as plant protection products; they include, for example, chlorinated compounds (DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, lindane, chlordane, carbon tetrachloride, pentachlorophenol), heavy metal compounds (arsenic, lead and cadmium), mercury compounds, atrazine and methyl bromide. Eight other substances, such as paraquat and diquat, are allowed but only with restrictions. 49 substances, such as diuron and glyphosate, are subject to use restrictions to protect ground water in water protection zones, for example.

⁵"Rückstände von Flammenschutzmitteln in Frauenmilch aus Deutschland unter besonderer Berücksichtigung von polybromierten Diphenylethern (PBDE)", duration: 01.07.2002 to 31.10.2004, Environmental Research Plan of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

⁶The Federal Office of Consumer Protection and Food Safety and the Federal Ministry of Food, Agriculture and Consumer Protection publish information on possible residues from plant protection products in their National Reporting of Residues from Plant Protection Products ("Nationale Berichterstattung Pflanzenschutzmittelrückstände").

⁷One positive effect of UV radiation is the production of vitamin D in the skin. However, a low level of radiation is sufficient for this.

⁸The SSK is an advisory board of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. It gives advice in all matters related to protection against ionizing and non-ionizing radiation. Its activity also includes evaluation of recommendations on radiation protection developed by international bodies such as the ICNIRP and WHO. SSK also regularly publishes reports and evaluations of current research.

Additional information:

Action Programme Environment and Health (APUG): <http://www.apug.de>

Biocides Act: <http://www.bmu.de/chemikalien/biozide/biozidgesetz/doc/6904.php>

“Blue Angel” eco-label: <http://www.blauer-engel.de>

Chemicals Act: <http://bundesrecht.juris.de/chemg/index.html>

Commission on Indoor Air Quality (IRK):
<http://www.umweltbundesamt.de/uba-info-daten/daten/gesundheit/irk.htm>

Commission on Radiological Protection (SSK): <http://www.ssk.de>

Conference of Ministers of Health (GMK): <http://www.gmkonline.de>

Dangerous Goods Ordinance: <http://bundesrecht.juris.de/ggvse>

DJ “Driving Licence”: <http://www.dj-fuehrerschein.com>

“Down with noise” campaign: <http://www.schluss-mit-laerm.de>

European Chemicals Regulation (REACH): <http://www.reach-info.de>

Federal Association of German Discotheques and Dance Clubs (BDT e.V.) within the German Association of Hotels and Restaurants (DEHOGA): <http://www.dehoga-bdt.de>

Federal Environment Agency (UBA) (noise): <http://www.umweltbundesamt.de/laermprobleme>

Federal Immission Control Act (BImSchG): <http://bundesrecht.juris.de/bimschg>

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (noise protection):
<http://www.bmu.de/laermschutz>

Federal Office for Radiation Protection (BfS): <http://www.bfs.de>

German Advisory Council on the Environment (SRU): <http://www.umweltrat.de>

German Environmental Survey for Children (GERES IV):
<http://www.umweltbundesamt.de/survey/us03/uprog.htm>

German Mobile Telecommunication Research Programme (DMF): <http://www.emf-forschungsprogramm.de/>

German Road Traffic Licensing Regulations (StVZO): <http://bundesrecht.juris.de/stvzo>

New Quality of Work Initiative (INQA): <http://www.inqa.de>

Plant Protection Act: http://bundesrecht.juris.de/pflschg_1986/index.html

POPs Convention (Stockholm Convention): <http://www.bmu.de/chemikalien/pop-konvention/doc/2176.php>

Professional Disc jockeys’ Association (BVD e.V.): <http://www.bvd-ev.de>

Radiation Protection Ordinance: http://bundesrecht.juris.de/strlschv_2001/index.html

Radio 108,8: www.radio108komma8.de

Study on “Environmental awareness in Germany 2006”: <http://www.umweltbundesamt.de/umweltbewusstsein>

Waste Act: http://bundesrecht.juris.de/krw_abfg

Water Act: <http://bundesrecht.juris.de/whg/index.html>

WHO Guidelines for Community Noise: <http://www.who.int/docstore/peh/noise/guidelines2.html>

Annex

List of abbreviations and acronyms

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List of abbreviations and acronyms

AAK	Self-help organisation for parents of children with allergies	BMI	Body Mass Index
AgBB	Committee for Health-related Evaluation of Building Products	BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
AOLG	Working Group of the Highest State Health Authorities	BMVBS	Federal Ministry of Transport, Building and Urban Affairs
APUG	Action Programme Environment and Health	Bq	Becquerel, unit of radioactivity
ARGEBAU	Working group of state-level ministers responsible for construction	BUK	Central Federation of Public Sector Accident Insurers
BAG	Federal association or working group	BUND	German branch of Friends of the Earth
BAM	Federal Institute for Materials Research and Testing	BVD	Professional disc jockeys' Association
BDT	Federal Association of German Discoteques and Dance Clubs	BVL	Federal Office of Consumer Protection and Food Safety
BfG	Federal Institute of Hydrology	BzBIG	Lead in Petrol Act
BfR	Federal Institute for Risk Assessment	BZgA	Federal Centre for Health Education
BfS	Federal Office for Radiation Protection	CEHAPE	Children's Environment and Health Action Plan for Europe (WHO)
BImSchG	Federal Immission Control Act	ChemG	Chemicals Act
BImSchV	Federal Immission Control Ordinance	ChemVerbotsV	Ordinance Banning Certain Chemicals
BMAS	Federal Ministry of Labour and Social Affairs	dB(A)	Decibels
BMBF	Federal Ministry of Education and Research	dbu	German Professional Association of Environmental Physicians
BMELV	Federal Ministry of Food, Agriculture and Consumer Protection	DDT	Dichlorodiphenyltrichloroethane
BMFSFJ	Federal Ministry for Family Affairs, Senior Citizens, Women and Youth	DEHOGA	German Association of Hotels and Restaurants
BMG	Federal Ministry of Health	DIN	German Institute for Standardisation
		DJ	Disc jockey

List of abbreviations

DVR	German Road Safety Council	µg	Microgram
DVW	German Traffic Observatory	µm	Micrometre
EC	European Community	mSv	Millisievert
EU	European Union	NEC	National Emission Ceilings
e.V.	registered association	ng	Nanogram
EWG	European Economic Community	NH ₃	Ammonia
Fig.	Figure	NMVOC	Non-Methane Volatile Organic Compounds
FluglärmG	Aircraft Noise Act	NO _X	Oxides of nitrogen
GBE	Federal Health Reporting Service	NRW	North Rhine-Westphalia
GDI-DE	German National Spatial Data Infrastructure	OSCE	Organisation for Security and Co-operation in Europe
GerES IV	German Environmental Survey for Children (= KUS)	PAHs	Polycyclic aromatic hydrocarbons
gGmbH	Not-for-profit limited company	PBDEs	Polybrominated diphenyl ethers
HBM	Human biomonitoring	PCBs	Polychlorinated biphenyls
HCB	Hexachlorobenzene	PCP	Pentachlorophenol
ICAO	International Civil Aviation Organisation	peb	Platform for Diet and Physical Activity
ICNIRP	International Commission on Non-Ionizing Radiation Protection (WHO)	PFOS	Perfluorooctanesulfonate
PM ₁₀		PM ₁₀	Particulate matter with a diameter less than 10 µm
IGUMED	Interdisciplinary Society for Environmental Medicine	POPs	Persistent Organic Pollutants, substances with persistent, bio-accumulative and toxic properties.
INQA	New Quality of Work Initiative		
INSPIRE	Infrastructure for Spatial Information in Europe	REACH	Registration, Evaluation and Authorisation of Chemicals (European Chemicals Regulation)
IRK	Commission on Indoor Air Quality	RKI	Robert Koch Institute
KiGGS	German National Health Survey for Children and Adolescents	SCALE	Science – Children – Awareness – Legal Instruments – Evaluation (European environment and health strategy)
KUS	German Environmental Survey for Children (= GerES IV)		
LAUG	State Working Group on Environment-Related Health Protection	SO ₂	Sulphur dioxide
m ³	Cubic metres	SRU	German Advisory Council on the Environment

List of abbreviations

SSK	Commission on Radiological Protection	UN/ECE	United Nations Economic Commission for Europe
StVZO	Road Traffic Licensing Regulations	UNCED	United Nations Conference on Environment and Development
SVOC	Semivolatile Organic Compounds	UV	Ultraviolet radiation
TA	Technical instructions	VO	Ordinance
TrinkwV	Drinking Water Ordinance	VOC	Volatile Organic Compounds
TVOC	Total Volatile Organic Compounds	WaBoLu	Water, soil and air hygiene
UBA	Federal Environment Agency	WHG	Water Act
UMTS	Universal Mobile Telecommunications System (Mobile phone standard)	WHO	World Health Organisation
UN	United Nations		

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