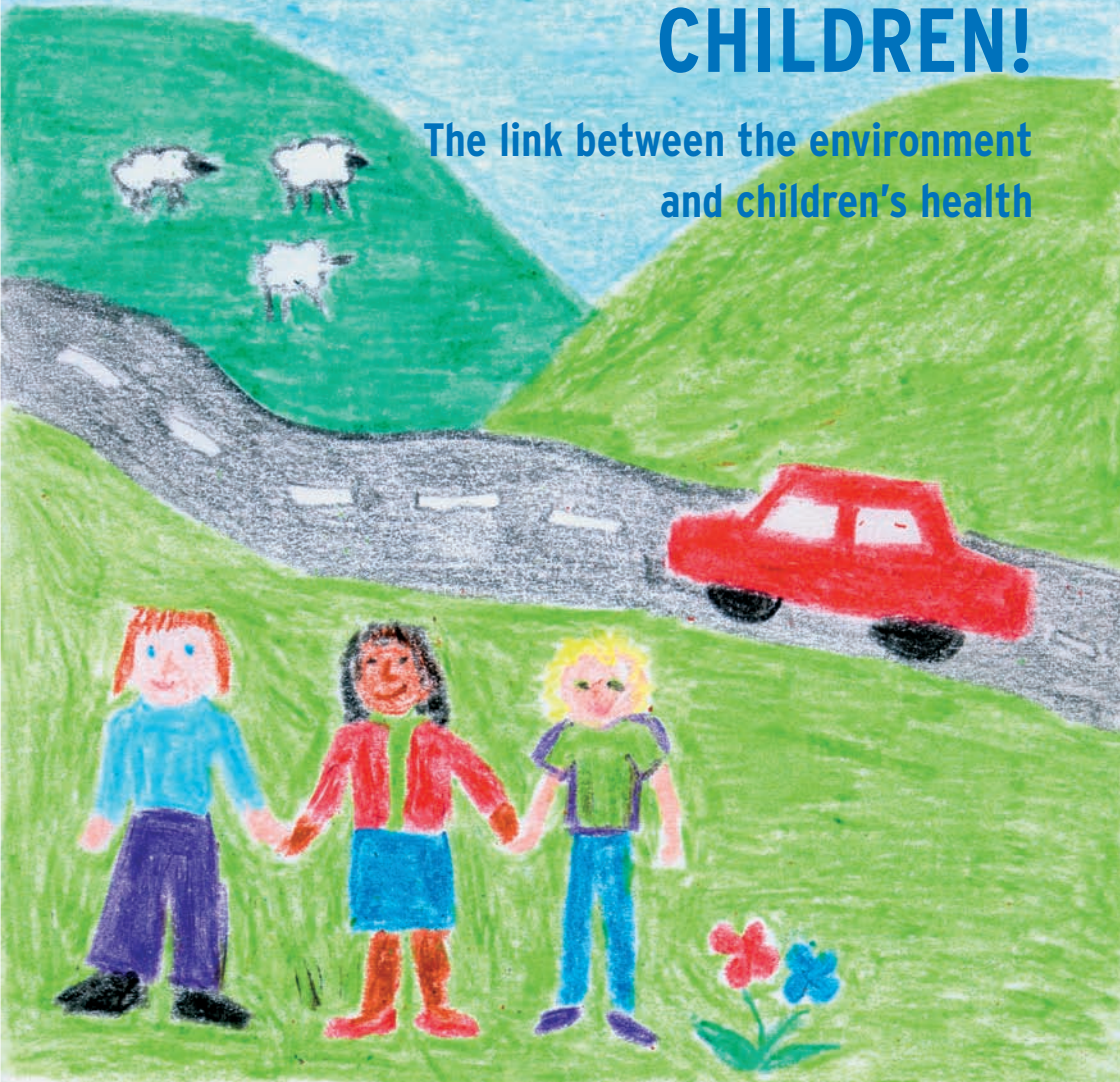


CHILDREN!

The link between the environment
and children's health



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EVERYONE IS DIFFERENT - THAT APPLIES TO CHILDREN, TOO

For a long time we have been aware of the fact that environmental influences play a central role in human health and particularly children's health. Children are not simply small adults. They often react differently – often with greater sensitivity – to environmental influences. Depending on their age, children can be exposed to these influences for longer periods of time than adults.

“We increasingly understand that the health and well-being of our families depends upon a clean and healthy environment. Nowhere is this more true than in the case of children.” This is a direct quotation from the Declaration of the Environment Leaders of the Eight on Children's Environmental Health issued at the end of the summit held in 1997 in Miami (the Group of Eight, or G8, consists of the seven leading industrial nations, plus Russia).

This information brochure is addressed to anyone who would like to know more about the effects of environmental influences on children's health.

It shall provide interesting information to parents, teachers and young people.



“It is not possible to give a global answer to the question of whether the health of children and adolescents is better or poorer than ten or twenty years ago. Generally speaking, it can be said that there has been a shift in the range of illnesses affecting children and adolescents – and adults too – away from the infectious diseases that still prevailed at the beginning of the 20th century to illnesses that are usually multicausal and often chronic.” However, on the increase in chronic conditions such as allergies, obesity and behavioural disorders the authors of the report add the qualify-



Children are our future:

They will constitute tomorrow's society. Protecting them is therefore a crucial responsibility.

ing remark, “that these syndromes (...) have attracted greater attention in recent years both in medical journals and in the general press,” so that the increase “can also be attributed to a new awareness of certain symptoms – both amongst doctors and the parents questioned.” (An extract from the Focus Report published as part of the Federal Government’s health reporting entitled “Gesundheit von Kindern und Jugendlichen,” RKI 2004. This report, which describes trends over time in incidence of illnesses, can be ordered from the Robert Koch Institute or downloaded from the website at www.rki.de.)

Children may react especially sensitively to influences from the environment and have greater difficulty than adults in avoiding some types of pollution. Typical behaviour patterns of small children include hand-to-mouth contact, crawling and playing on the floor or ground and digging, which can be associated with taking in dirt and contaminants. Air, water and soil pollution, along with ingesting different chemicals in food, can also impair health.

WHAT MAKES CHILDREN PARTICULARLY SENSITIVE IN MANY CASES?

Some of the ways in which a child's body reacts differently from that of adults are directly age-related. The child's organism is still developing and may therefore show a more sensitive reaction to contaminants. Children have greater surface area of skin in relation to body weight, a higher respiratory minute volume per kilogram of body weight, a higher metabolic rate, and absorb toxins from the gastrointestinal tract (lead, for example) more readily.

In the case of some substances that have proven to be harmful to health, it is actually known that children are more sensitive than adults (lead or mercury, for example). For other substances, such as certain pesticides or PCB,* for example, animal experiments indicate that the developing nervous systems of children react more sensitively than those of adults.

But the different pathways through which children may be exposed to influences that are detrimental to their health also play an important role. For example, children crawling around on the floor ingest significantly larger amounts of dust than adults. The dust may contain harmful substances, such as combustion residues, plasticisers such as DEHP or also radioactive substances (that occur in nature).

Organ development can also be a factor, if for example certain detoxifying liver enzymes are not yet fully developed. On the other hand, that can also be an advantage because it is these same enzymes that make certain substances "toxic" in the first place.

Other factors also have an influence on children's health. For example, children's age-related behaviour and their social environment play an important role. Sufficient exercise and opportunities for play, the parents' smoking habits and a healthy diet are just a few examples to be mentioned here.

* Polychlorinated biphenyls (Many of the scientific terms used in the brochure are explained in plain English in the Glossary at the end of this report.)

The interaction of these factors has an impact on the specific susceptibility of an individual, whatever stage or development they are in: children of different age groups react to particular influences with differing degrees of sensitivity.

ARE CHILDREN MORE SUSCEPTIBLE IN PRINCIPLE?

No, children do not always react with greater sensitivity than adults to environmental pollutants. This question has to be answered individually for each of the different noxae (harmful influences). Generalisations often paint a misleading picture, suggesting that children are in general more sensitive to all influences at all ages and in all situations.

However, we are not yet aware of all the influences that may be harmful to health. To be able to identify environmental health risks for children, health-related environmental observations and environment-related health observations in children are necessary.

In the past, little data were collected on extent to which children are affected by pollutants or harmful influences. However, this situation is set to improve: the Robert Koch Institute (RKI) is currently carrying out a survey of children and adolescents which will make it possible to acquire data on the state of health of children and adolescents that are representative for the whole of Germany. At the same time the Federal Environment Agency (UBA)

is conducting an Environmental Survey in conjunction with the RKI which will produce representative data on relevant environmental influences on children's health. For further information see www.kiggs.de and www.umweltbundesamt.de/survey/.



DO LIMIT AND GUIDELINE VALUES ALSO APPLY TO CHILDREN?

Children must be given special consideration when assessing the danger of particular environmental influences. The responsible agencies at Federal and state level are paying increasing attention to this problem and taking vulnerable groups, especially children, into consideration when assessing this kind of risk to health. For example, so-called safety factors are normally used when setting guideline or limit values for environmental media and food. These factors (a factor of 10 is often used, for example) are considered to be appropriate to ensure that individual differences are taken into account, even for the most vulnerable age group. They must always be used whenever no other - more precise - information from studies or other sources is available to indicate that children's sensitivity differs, which would justify using a smaller or larger safety factor.

In radiation protection for children, both age-specific physical characteristics such as body size and metabolic processes and habits are taken into account. In some cases, the guideline or limit values for radioactive substances in baby food are set lower than those allowed for adult food on precautionary grounds.



In some cases, children are also given special consideration because of higher exposure levels. The Commission on Indoor Air at the Federal Environment Agency, for example, sets guideline values for specific substances that are found in indoor air. A safety factor of 2 is usually applied to take children into consideration due to their particular breathing patterns.

THE GERMAN ENVIRONMENTAL SURVEY FOR CHILDREN (GERES IV)



Which environmental influences are especially harmful to children? Do we need to take particular precautionary measures? Are children showing more sensitive reactions today than in the past? These are some of the questions being addressed by the German Environmental Survey for children (GerES IV).

The environment changes and with it people change, too. Some illnesses or environmental risks that were very significant in the past are scarcely relevant today. But new problems constantly emerge and it is crucial that

we identify any potential dangers as soon as possible and draw the necessary conclusions.

In a pilot study within the nationwide survey it emerged, for example, that some children are apparently exposed to higher concentrations of plasticizers than was formerly realised. These substances, which may be present in many plastic products, are now very widespread in the environment. They are suspected of having a detrimental effect on health and in particular on children's health. Further investigations are being carried out to clarify this suspicion.

This preliminary study revealed a declining trend for other substances. For example, concentrations of lead are continuing to drop and were often so low that it was scarcely possible to measure them, i.e. they were on the detectability threshold.



PESTICIDES AND OTHER CHEMICALS

For some chemicals, such as lead and mercury, it is accepted as certain that children are particularly susceptible. For other substances, such as a number of pesticides, for example, there are indications that they may have an adverse effect on children's still developing nervous system. That is taken into account when licensing them.

Some substances that were produced in large volumes in the past (PCB, flame retardants or certain musk compounds) have accumulated in the environment and can sometimes be detected today in breast milk or in children's blood and urine. That does not mean that these substances will necessarily cause damage, particularly since there have been vast improvements in measuring techniques in recent years, with the result that substances can now be detected even in very low concentrations. Nevertheless, findings of that kind are not desirable. Most of these substances are now banned in Germany and Europe, but contaminated food or *Bedarfsgegenstände** can still find their way into Germany in imported goods .

Although we should not make a general assumption that products are a health risk, it is nevertheless advisable to avoid using unnecessary chemicals around the house.

If products are sold very cheaply, it is worth thinking about whether such a low price might be due to the fact that little attention was paid to environmental and health aspects during their production.

Another important thing to note: to avoid poisoning, cleaning and personal care products should always be kept out of the reach of children.

* Under German law *Bedarfsgegenstände* are products that the consumer comes into direct contact with, such as personal care products, toys or cleaning products. See also the Glossary at the end of this report.

Chemicals in the home: what does that include?

Cleaning products, detergents and washing up liquid, solutions containing alcohol, oils, caustic and acid products, powders, sprays and pastes – the list goes on, and it is not possible to include everything, because:

Chemicals are to be found in virtually all areas of our daily life. Often the consumer does not realise what is included in the term household chemicals.

Even products that are advertised as “containing no chemicals” cannot really work without chemicals, because in fact all products are made up of chemicals. For example, scented or aromatherapy oils, shower gels, soaps and candles all contain chemicals – even if you did buy them in the wholefood shop – and those chemicals could cause serious health problems if you swallowed them.

POISONS AROUND THE HOME - A REAL DANGER

Again and again, cases occur of children being poisoned by household chemicals such as cleaning products, medicines or even poisonous plants. This happens most frequently in the kitchen or bathroom. In cases where the children are under a year old, the most common place the poisoning happens is the living room. Later they “conquer” the garage or basement, in other words children accompany their parents into the hobby and DIY areas of the home. To prevent health problems and poisoning from paints, solvents and insecticides, make sure that hazardous products are always kept under lock and key and out of the reach of children.



A particular problem for children are cases of poisoning with dangerous lamp oils that contain paraffin or petroleum. Children often drink these oils from lamps and garden torches that are left unguarded within their reach. Great care should also be taken with barbecue lighting fluid. Legislation has been passed so that since 1999 safer alternatives are now available for coloured and per-

fumed lamp oils. However, that is not yet the case for clear lamp oils and barbecue lighters. Care must also be taken with caustic products such as descalers or toilet, oven and dishwasher cleaners. Here it is vital to pay particular attention to the warning labels because serious burns can occur and cause permanent damage.

It is also important to avoid having poisonous plants around the home and garden until the children are old enough to understand that they are poisonous. BfR brochures on this topic give good advice. They can be obtained by contacting the press office at BfR.

Important points to protect children from poisons:

- *Keep household products (cleaning products, acids, caustic products, insecticides) under lock and key.*
- *Lock medicines away in a safe place such as a special medicine cabinet.*
- *Make sure any alcoholic drinks are kept safely where children cannot reach them.*
- *Keep tobacco products, matches and cigarette lighters somewhere where children can't get at them.*
- *Empty ashtrays and throw cigarette ends away regularly.*
- *Remove oil and aroma lamps or other ornaments that contain chemicals from the reach of children – homes with young children should preferably not have these things at all.*
- *Remove poisonous plants and shrubs from the home, from window sills or the garden.*

WHAT SHOULD I DO IF SOMETHING NEVERTHELESS HAPPENS?

The best thing is to contact a Poisons Information Centre or paediatrician for advice. You will find the phone numbers of Poisons Information Centres in Germany in the annex to this brochure.

Do not on any account waste time trying to deal with the poisoning yourself using household remedies. Giving milk will in most cases aggravate the poisoning. It can also be dangerous to try and make the child vomit. Using salt water to try and do this can even be fatal for children. If you suspect a child has swallowed something poisonous follow the recommendations of the experts at the Poisons Information Centres.

HEALTHY AIR TO BREATHE

Since children in Germany spend a great deal of time indoors – up to 90 per cent of their time – they are exposed to a high degree to risks that arise from the use of products or the existence of certain influences in the rooms. Making indoor spaces increasingly airtight (windows and doors that when shut do not let in any air) and not opening the windows often enough to let fresh air in can make the indoor air too humid and not only pollutants but also allergens, e.g. from mould and house dust mites, can accumulate.

The quality of indoor air is almost always poorer than that of outdoor air. Tobacco smoke, vapours seeping out from building materials and furnishings, and insecticides used on carpets, for example, may be present. By using household products that contain harmful substances, paints and varnishes containing solvents or allowing children to use crayons that are not suitable, children may inhale these substances or absorb them through the skin.

Important for healthy indoor air:

- *As a general rule, it is important to ensure that homes have enough fresh air, because in most cases the outdoor air is much better than the indoor air. It is best to air out rooms several times a day briefly but thoroughly (5-10 minutes) preferably by opening facing windows to create a through draught.*
- *Do not smoke in homes where there are children. There is no other air pollution where the indications of real harm being caused to children's health are clear-cut as for passive smoking.*



But there are also risks to children's health from the air they breathe outdoors. For example, children may be exposed to high ozone concentrations in the summer. This applies equally to babies kicking or crying in their prams and to toddlers running around or schoolchildren engaged in sports when ozone concentrations are high.



Sport and exercise, especially in the fresh air, are extremely important for children. But: if ozone levels are high, care should be taken that children do not do sport or run around too energetically at midday or early afternoon when the highest ozone concentrations occur, since ozone can cause irritation of the respiratory tract.

Also pollutants such as nitrogen oxides, polycyclic aromatic hydrocarbons (PAHs) and fine dusts in the inhaled air can pose a health problem. Their small body size means that children may be exposed to higher concentrations of car exhaust gases on their way to kindergarten or school, for example.

Relative to body weight and unit of time, young children breathe significantly more air than adults. This means that they may absorb more pollutants through inhalation. However, it is difficult to establish the exact amount of pollutants children actually absorb through the lungs. To be on the safe side, assessments therefore assume a very high or even complete absorption.

For inhaled radioactive substances, the physical and chemical properties of the radioactive particles, the age-specific breathing patterns and the dimensions of the child's respiratory tract are taken into account.

Everyone is to a great degree responsible for the quality of the air in their own home, which means that children are usually dependent on their parents. Parents can do something beneficial for their children – and also for themselves – by not smoking at home. When buying products such as paint and adhesives, preference should be given to low-pollutant products wherever possible, even if they are sometimes slightly more expensive. Furniture and carpets, especially when they are new, can also pollute the indoor air. Imported products may also occasionally contain substances that have been banned here for a long time. Many low-pollutant and low-emission products



now carry the ecolabel known as the “Blue Angel” (www.blauer-engel.de).

Joss sticks, scented candles and oil lamps should not be used on precautionary grounds. A modern heating system and an electric cooker can reduce the pollution of indoor air caused by products of combustion.

Avoid using air fresheners, perfumed toilet blocks or similar products to get rid of unpleasant odours, in the toilet for example. Extensive airing out and regular cleaning are far better for

your health. Letting fresh air into the room will also counteract the accumulation of natural radioactive substances, such as radon, for example, in the indoor air.

At this point it is important to note that it is completely unnecessary to use disinfectants to clean your home as they do nothing to prevent disease. They are at worst an additional health risk for children and an additional source of pollution for effluent and therefore the environment as a whole.

THERE IS OFTEN A LINK BETWEEN ALLERGIES AND ENVIRONMENTAL FACTORS

An allergy is not something you are necessarily born with; it can develop during the course of your life. An allergy is an exaggerated reaction of the immune system to particular substances you have come into contact with repeatedly (known as allergens).

The incidence of allergies has shot up in recent years. Particularly children are more likely to suffer from an allergy very early on in life or show an atopic condition such as neurodermatitis which indicates a higher likelihood of developing an allergy. For example, the incidence of hayfever in 6-year-olds is said to be 1-7% and up to 10% in older children. A very common skin disease is neurodermatitis, which often affects children: up to 12% of children of preschool age suffer from it.

Atopic diseases, such as hayfever or neurodermatitis, are caused by the body reacting in an excessive fashion to what are in themselves harmless substances such as food ingredients, house dust or pollen – in other words, substances we encounter daily.



Often the symptoms of an allergy are either not correctly recognised or played down. And yet inadequate treatment of an allergy or the onset of asthma in children can cause lasting damaging over the course of their life (e.g. bronchial asthma) and therefore significantly impair their quality of life.

Allergy triggers in children's environment:

After pollen, house dust mites are the second most common allergy triggers (approx. 25% of all allergies). It is not actually the mites themselves that act as allergens, but components of their excrement. They are the most prevalent allergens in house dust. Mites are tiny spider-like creatures that are barely visible with the naked eye (0.1-0.5 mm). They live on flakes of skin and are therefore often to be found in great numbers in carpets, mattresses and bed linen. They need relatively high ambient humidity and therefore thrive in warm and poorly ventilated homes.

What can I do if my child has an allergy or is susceptible to house dust (has neurodermatitis, for example)?

Measures to combat mites:

- *Make sure the child's bedroom is well ventilated and not too hot.*
- *Do not allow pets into the bedroom.*
- *Leave beds turned back during the day to allow them to air out.*
- *Wash bed linen regularly on as hot a cycle as possible.*
- *Avoid fitted carpets in the bedroom.*
- *Avoid dust traps in the home (open bookcases etc.).*
- *Do not use humidifiers.*
- *Do not let the child use the vacuum cleaner; the vacuum cleaner should be fitted with a fine dust filter.*
- *Consider using special mattress covers and bed linen (if the allergy already exists).*

Pets in the home

Of all pets, cats most commonly cause allergies and a large proportion of allergy-sufferers are sensitive to cats. But other animals can also trigger or exacerbate allergies: dogs, birds or rodents. They should therefore not be kept in homes with people who have an allergic reaction to these animals.



However, some allergens are very long-lived. Cat allergens can still be found in homes years after cats no longer live there.

Two things can be said for certain: there are grounds not to keep pets only if children have a higher risk of allergy. Keeping pets is not an appropriate way of preventing children from developing an allergy.

What can I do about it? Tips on pets and children's allergies:

As a precautionary measure, it is advisable not to keep furry animals.

- *Existing data suggest that early contact with dogs (for example, if you already have a dog when the baby is born) is not associated with a higher allergy risk.*
- *As far as cats are concerned, the majority of studies on the subject see keeping cats as a risk factor. For that reason, it is advisable not to keep cats where there are children at risk (those with neurodermatitis, for example).*
- *The same applies to keeping rodents (rabbits, guinea pigs): it is preferable not to keep them in homes where there are children with a higher allergy risk.*

Source: DGAI, DDG, ABAP: Leitlinie Allergieprävention, Allergo Journal 13 (2004), issue 3, p. 252-260

Hay fever

Many plants produce masses of pollen when they are in flower, which are then transported by the wind. The pollen count is problematic only at certain times of year, which



varies according to the species of plant, so that people with allergies – depending on which particular pollen they are allergic to – suffer at different times. The pollen of wind-pollinated plants (weeds, grasses, trees) is particularly significant. When the pollen that someone is allergic to is in the air they will develop the typical symptoms of hayfever with red eyes and a blocked nose.

Children too – especially if they have a predisposition to it – often suffer from hayfever. Over longer periods what is seemingly just an irritating health problem can develop into allergic bronchial asthma. People who are allergic to pollen should therefore not expose themselves excessively to the pollen that triggers their particular allergy.

What can I do if I already have a pollen allergy? Possible measures:

- *Do not go for walks through meadows that are in flower.*
- *Keep your lawn short and do not mow it yourself.*
- *Keep your car windows closed, because outdoor air that comes in through the car's ventilation system will have trapped the pollen on the filters. In many cases, it should be possible to fit additional pollen filters.*
- *If possible, choose rooms as bedrooms that are not on the side of the house facing the prevailing wind.*
- *Take the child to an allergy specialist because there are effective treatments for the symptoms!*

MOULD IN THE HOME

Mould can also trigger allergies. As an isolated allergen, mould is less significant than pollen or pet hairs, but many allergy sufferers also react additionally to mould. Because of its harmful effect on health, children should not spend any length of time in rooms where mould is growing, especially if there is a serious infestation. Mould grows at high levels of humidity (from 65–70%, with seasonal variations) on many different materials, in other words not just on food, but also on books, wallpaper, clothes etc. If a home has inadequate ventilation and a lot of humidity is produced there will be a risk of mould infestation. Many new or newly decorated houses that have tightly shutting windows and thus only a low rate of air exchange, provide excellent conditions for mould fungi to grow. But older buildings with inadequate heat insulation and/or structural defects may also pose a risk because of condensation. To avert problems with indoor air quality the same rules as those for house dust mites essentially apply.

What else can I do?

- *Be sure to air out particularly the rooms in the home where humidity levels are higher (bathroom, kitchen and bedrooms), i.e. open the windows wide for 5–10 minutes.*
- *Do not place furniture right up against exterior walls as mould will often start to grow behind it.*
- *Do not keep houseplants in the bedroom as the soil often contains mould fungi.*

How do I recognise mould and when do I need to do something about it?

Mould infestation is not always visible (it is sometimes hidden in the cavity of a wall or behind furniture etc.) and sometimes you will only become aware of the problem when you start to notice a musty, mouldy smell or the first signs of dark patches on walls, ceilings or furniture. Advice on when and how to deal with it and other tips on preventing damage from mould in the home can be found in the Federal Environment Agency's brochure "Hilfe! Schimmel im Haus". It can be obtained free of charge or downloaded from the website at www.umweltbundesamt.de (publications page).

WATER: NOT ALWAYS SUITABLE FOR DRINKING, PLAYING AND SPLASHING AROUND IN

Thanks to the strict provisions of the Drinking Water Regulation, Germany's drinking water is one of the most tested and least polluted of all our food-stuffs. In individual cases, higher levels of lead may occur due to lead water pipes and fittings, for example, which can damage children's health. Higher copper levels may also occur where the water is very hard or new copper pipes have been fitted. In general, only freshly drawn water should be used to prepare food and if you have lead pipes in the home use a suitable brand of bottled water instead.

High nitrate concentrations that sometimes occur in the water of private wells can also be dangerous for babies. Again suitable bottled water should be used to prepare baby food. The water should be labelled "Suitable for the preparation of baby food."

Children suffering from diarrhoea due to poor-quality drinking water practically never occurs anymore in Germany, whereas it is still a problem in parts of Europe (some countries of Eastern Europe, for example) and above all in developing countries. In many cases children who fall ill due to poor quality drinking water may even die if they do not receive adequate medical attention.



If you have any questions about the quality of your drinking water, your water utility company will be happy to provide information, as will your local Gesundheitsamt or public health agency. If you would like to know whether your building has lead pipes you should first of all ask your landlord. Other important information can be found in the brochure "Lead and



drinking water” which is available free of charge from the Federal Ministry of Health (BMG).

Summer: the swimming season

Whether outdoors in the summer or indoors in the winter, you can swim in public swimming pools without concern. The pool’s operator and the public health agency carry out regular checks to ensure that the water in the pool does not pose any health risk.

There are many opportunities for swimming in natural waters that are officially designated as EU bathing sites and are regularly monitored. The current quality of these bathing sites in many of Germany’s states can be checked on the Internet. The website of the Federal Ministry of the Environment, Nature Conservation and Reactor Safety (BMU) has an overview with links to the EU bathing sites in your state: www.bmu.de/fb_gew/index.php?fb=2435



Avoid swimming in the sea or inland waters unless they are officially designated as safe for swimming. Children can contract gastrointestinal infections from waters that are polluted with sewage. There is also a risk of accidents.

MOBILE PHONES FOR CHILDREN - MAYBE NOT SUCH A GOOD IDEA?



The scientific evidence for whether children and adolescents are more sensitive than adults to the high-frequency electromagnetic fields of mobile phone networks is inconclusive. Current knowledge suggests that there is no reason to fear adverse effects on health from mobile phone fields.

Nevertheless, we can assume that children will be exposed to mobile phone fields for a considerably longer time span in their lives than today's adults. That is why it cannot completely be ruled out that over the long period of an entire lifetime adverse effects might develop that are as yet unknown. Furthermore, the issue of

whether children - who are after all still developing - are more susceptible has still not been conclusively resolved.

Until this has been unequivocally resolved, children's use of mobile phones should as a precautionary measure be confined to the minimum necessary - a precaution which incidentally also applies to adults.

For further information on the topic of electromagnetic fields, please visit www.bfs.de/elektro.

A brochure written specially for children and adolescents entitled "Mobilfunk: Wie funktioniert das eigentlich?" can be obtained from the Federal Office for Radiation Protection (BfS):
www.bfs.de/bfs/druck/broschueren/Brosch_Mobilfunk_Link

Children and mobile phones – how can I cut down the risks?

- *It is important to teach children responsible use of mobile phones. Mobile phones are not toys and should only be used when a landline is not available.*
- *Mobile phone calls should always be brief.*
- *Use low-radiation handsets to keep the fields the user's head is exposed to as low as possible.*
- *It is also important to wait for the connection to be established before putting the phone next to your ear. Mobile phones transmit at maximum power when connecting to the network.*
- *The power at which the mobile phone transmits depends on how good the connection to the nearest base station is. For that reason avoid using your mobile when the coverage is poor, in enclosed spaces, for example.*
- *The closer you hold the phone to your head the higher the level of radiation you will be exposed to. The electromagnetic fields get weaker with increasing distance. That is why it is better to hold the mobile away from you when texting or to use a headset when making a call.*

SUNLIGHT - TOO MUCH DAMAGES CHILDREN'S SKIN

What could be nicer for children than building sandcastles and splashing around on the beach in brilliant sunshine? Fortunately most parents now realise that sunlight also holds risks. The problem: solar radiation contains a high proportion of harmful ultraviolet (UV) light. Too much exposure to ultraviolet light can have both acute effects such as sunburn, but also long-term effects such as premature aging of the skin, skin cancer and weakening of the immune system.



In this connection, children are particularly at risk. Sunburn can be especially dangerous for children because being sunburnt numerous times during childhood has been linked to a higher risk of skin cancer. Extensive and frequent sunbathing during childhood can also cause increased formation of moles, which are a risk factor for malignant melanoma, a type of skin cancer that may occur much later in life. Children spend more

time outdoors playing or taking part in sporting activities than adults. It is estimated that by the time they are twenty years old they have been exposed to about three quarters of their total lifetime UV dose.

Children should stay out of the sun in the summer, particularly around mid-day. They should always be protected from the sun by using sunscreen or wearing clothing that does not allow the sun's rays to penetrate.

Many families spend their holidays in regions where the ultraviolet rays are much stronger than is normal in Germany. The risks resulting for children in particular are often underestimated or ignored.

Further information on the subject of what is known as “optical radiation” can be found at www.bfs.de/uv.

A brochure written specially for children and adolescents “Mit heiler Haut durch den Sommer” can be obtained from the Federal Office for Radiation Protection (BfS): www.bfs.de/uv/uv2/kinder_flyer.html

What else can I do?

- *Be sure to protect yourself adequately from the sun’s rays, particularly when on holiday at the seaside, in the mountains or when skiing.*
- *Don’t forget to pack a sunscreen with a high sun protection factor (at least 20) and more importantly remember to use it – before you go into the sun.*
- *Take care to wear clothing that does not let the sun’s rays through – a thin T-Shirt will not necessarily stop you from getting sunburnt.*
- *Children must on no account be allowed to use sun beds.*

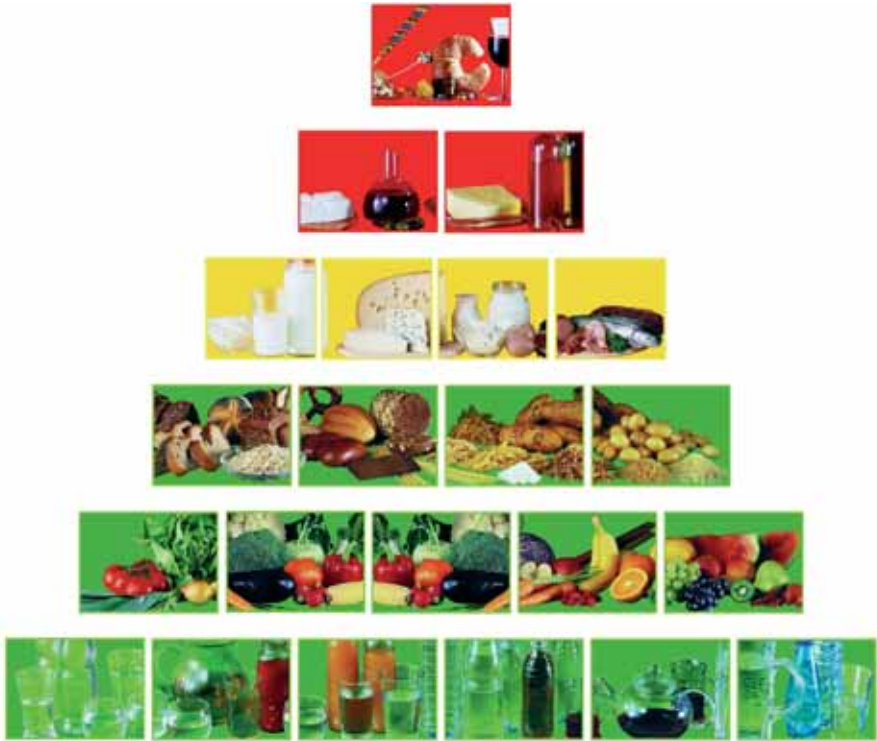
But sunlight not only has hidden dangers: apart from having a positive effect on our general sense of well-being, it also has properties that are decidedly healthy. For example, UV radiation helps the body to produce vitamin



D in the skin. A vitamin D deficiency can cause rickets in children. However, it is inadequate dietary intake of vitamin D or vitamin D precursors that is usually responsible for vitamin D deficiencies, not insufficient sunlight. Vitamin D can be found in food such as fish or eggs and dairy products. In Germany there is a slightly inadequate intake of vitamin D, as in many other industrialised countries. Deficiency diseases such as rickets as a result of an extreme shortage of vitamin D are nevertheless a rarity.

EATING THE WRONG FOOD MAKES CHILDREN ILL

Children have a sweet tooth and love to drink lemonade and eat white bread. But not eating a balanced diet and getting enough exercise means that a vast number of children today suffer from obesity, which in many cases will continue into adulthood. That in turn leads to health problems such as diabetes or premature wear and tear of the joints.



The nutrition pyramid

Source:aid-infodienst

But what is the right food for children?

For babies the advice remains unchanged: they should be breastfed exclusively until they are six months old. This has been proven to be the best nutrition for young babies. At six months, some solid food should be added to the diet. Exactly what kind of solids are given differs from country to coun-

try and culture to culture – the tried and tested method in Germany is to give babies pureed vegetables, meat and potatoes. Gradually whole milk, cereals and fruit are added to the baby's diet and then later snacks of bread and milk, so that by the time the baby turns one, he or she is eating the same food as the rest of the family.

The best way of achieving this is considered to be an “optimised mixed diet” consisting of one hot meal (lunch, for example), two cold meals (breakfast and evening meal for example) and two snacks.

Cakes, sweets and biscuits are acceptable for children as an occasional snack.

Salad or fruit and vegetables, some of them raw, should on the other hand be part of every meal.

Fruit and vegetables should, of course, always be washed thoroughly before eating them to remove dirt and any residues of pesticides.

It is better to avoid sugary drinks such as Cola or lemonade altogether – or at least allow children to drink them only occasionally as an exception. Water or tea might not be as popular but they are far healthier.

It is not possible to go into detail about the subject of a healthy diet here. In general, however, it can be said that the choice of food has a far greater influence on health than exposure to so-called environmental toxins.

When choosing food it is important to take into account whether it was produced in a way that is responsible for human beings, animals and the environment alike. Choose products where this is the case. Food sold at extremely low prices will rarely have been produced responsibly. You are what you eat and that also applies to your children.



NOISE – A PROBLEM FOR CHILDREN, TOO

There is no conclusive evidence about whether children are more sensitive to noise than adults. However, it can be said that they have less control over their environment than adults, and that in their free time they are often exposed voluntarily or involuntarily to sources of loud noise (discos, Discman,, road traffic, noisy household appliances etc.)

Noisy toys can also be a problem for young children. Children are fascinated by loud noises, which is why they love to play with noisy toys. They are not old enough to understand that they are putting their hearing at risk. Here both parents and teachers must be very attentive.

Findings exist for adults on the long-term health effects of chronic exposure to noise. If the exposure begins in childhood it can be expected that the impact will be greater than if it begins later in life. That means that in case of noise the precautionary principle in health protection is particularly significant for children.

Damage to hearing is often irreversible and is often caused by short or sudden exposure to an extremely high noise level (for example, toy guns, boxing a child's ears, loud bangs, fireworks) but also by prolonged exposure (for example, frequent use of noisy toys close to the ear, squeaky toys, engines, noisy hobbies, loud music through headphones, music in clubs and at concerts.

Noise can also influence the release of particular hormones, in children as well as adults and cause a higher blood pressure. The effects of noise in exacerbating stress apply to children just as much as adults.

Noise produces annoyance reactions and sleep disturbances. Studies have shown that children are as susceptible as adults to noise annoyance although they enjoy making a noise themselves. Studies have clearly shown that children's learning suffers in schools exposed to noise (aircraft noise) and that they do not perform as well as children from schools where noise is not a problem.

THE SOCIAL ENVIRONMENT: JUST AS IMPORTANT AS A HEALTHY PHYSICAL ENVIRONMENT

The economic and social situation of the family clearly impacts on housing, on the overall conditions of children's lives and on their diet. For example, poor social conditions are often associated with exposure to higher levels of pollutants. Studies have repeatedly shown that the smoking behaviour of parents is dependent on these factors. Parents smoking in the home and in the presence of their children is a particular cause for concern. The social environment can also influence the smoking behaviour of children and adolescents.



A child's mental development benefits enormously from stimulation in the home environment. It is known that children who are neglected by their parents suffer impaired development. Similarly, it is known that in cases of children who are born with a health problem, the intensive care and attention given by the

parents can lead to enormous improvements that can decisively improve their quality of life later on. As far as environmental influences are concerned, effects can occur under unfavourable conditions that are caused both by lack of stimulation and the impact of pollutants. Only if parents are aware of specific risks and dangers can they have a protective influence on their children and also educate their children to live in a way that is environmentally aware and health-conscious. This awareness is in turn connected with the parents' own upbringing, education and standard of living. Usually a higher standard of living has a positive effect, but the impact on health is not always positive: neurodermatitis is observed more frequently in higher social classes, for example.

WHAT IS THE GOVERNMENT DOING TO PROTECT THE HEALTH OF OUR CHILDREN?

A vast body of legislation guarantees a very high standard of safety in Germany in connection with health and the environment. Nevertheless, new and previously unknown dangers repeatedly emerge that have to be identified and investigated. Government agencies at federal and state level are responsible for this and currently check the air we breathe and the quality of water and food, for example.

Drinking water in Germany is one of the best tested foodstuffs. The fact that this is the case is guaranteed by the Drinking Water Regulation which stipulates the maximum level



of specific substances in drinking water. The water quality in swimming pools and EU bathing waters is also regularly monitored.

Other health risks are not so obvious – but nevertheless every effort is made to reduce them. Contaminated soil, for example, is a particular risk for children's

health. The Federal Soil Protection Act is intended to help the government protect the public. Special requirements are applicable to soil on sports grounds or children's playgrounds (including sand in playgrounds or sports grounds).

We spend the majority of our time indoors. Good quality air breathed in these indoor spaces is therefore very important. A number of recommendations issued by different Federal institutions offer information on how to guarantee good indoor air such as, for example, the booklet published by the Federal Environment Agency on indoor air hygiene in schools. Also the publication "A healthier home – but how? Practical everyday tips" contains numerous recommendations and advice on this topic. Both publications can be downloaded from the Federal Environment Agency's website at www.umweltbundesamt.de or at www.apug.de.

The “Blue Angel” ecolabel is intended to help people choose low-pollutant products when buying certain building materials, furniture and electronic appliances (www.blauer-engel.de). After extensive testing, the ecolabel has



also been awarded to low-emission products made of wood and wood materials including a range of furniture, laminate flooring, panels and linoleum. The ecolabel has also been awarded for a wide range of wall emulsions. Based on an evaluation scheme for building materials developed by the Committee for the Health-related Evaluation of Building Products (AgBB), the ecolabel is also awarded to flooring adhesives, elastic floor coverings and mat-

tresses. Guidelines for awarding the label to upholstered furniture using the same criteria were also introduced recently. Electronic appliances, such as photocopiers, printers and multifunction appliances, can also receive the Blue Angel label if they are low-emission. The ecolabel thus helps improve the quality of indoor air.

Of course, one of the basic prerequisites for good indoor air is that the outdoor air is as clean as possible. Nationwide monitoring networks have been set up in Germany to check the levels of pollutants in the outdoor air. All the important substances that pollute the air are regulated by the Federal Pollution Control Act (BImSchG) and the secondary legislation passed to implement it. These regulations are constantly amended to ensure compliance with the latest requirements. The efforts to improve air quality have been successful in many cases. For example, typical winter smog episodes, during which high concentrations of sulphur dioxide and dust jeopardised the health of children, virtually never occur nowadays. The implementation of air quality legislation in the states of what was formerly East Germany has led to the incidence of respiratory tract illnesses in children dropping to the low level in former West Germany. As policies to prevent air pollution con-

tinue to expand in Germany and Europe, the quality of the air will improve still further.

The media repeatedly report on the alleged risks of mobile phones. In order to better assess the actual risks, the Federal Environment Ministry (BMU) and the Federal Office for Radiation Protection (BfS) have launched the German Mobile Telecommunications Research Programme. The funding of 17 million euros is provided in equal parts by the Environment Ministry and the mobile phone operators. The BfS implements and coordinates the programme. The aim of the research programme is to deliver scientifically sound evidence on basic biological effects and mechanisms and, incorporating international research findings, assess the significance of mobile phones for human health.



Information on the German Mobile Telecommunications Research Programme is available at the programme's Internet portal at www.emf-forschungsprogramm.de.

In order to inform the public about the possible dangers of the sun's UV radiation, 3-day UV-index forecasts are published for Northern, Central and Southern Germany every Monday, Wednesday and Friday from April to September. The UV index is produced by the Federal Office for Radiation Protection (BfS) in conjunction with the German Meteorological Service (DWD) and the Federal Environment Agency: www.bfs.de/uv/uv2/uvi/prognose.html

ACTION PROGRAMME ENVIRONMENT AND HEALTH (APUG)



Children need an environment in which they can live healthily. In order to promote this aim, several ministries and supreme Federal authorities are working together as part of the Action Programme Environment and Health – APUG for short. Children are one of the key areas of APUG’s work. APUG was presented by the German Environment Ministry and Health Ministry on the 3rd Ministerial Conference on Environment and Health for Europe in London . The Federal

Ministry of Consumer Protection, Food and Agriculture (BMVEL) has since also joined.

The action programme funds research on the connection between environmental influences and detrimental effects on children’s health. The programme’s other important aims include developing measures to promote a dialogue in society on the health risks for children of environmental pollution and drafting policy recommendations designed to protect children.

A number of research projects studying the connection between environmental influences and detrimental effects on children’s health have already been completed:

- *Research project “Taking children into account as a particular risk group when deriving health-related environmental standards” (Project no.: 201 61 215, Schneider et al., 2002)*
- *Children’s exposure to pesticides (Project no.: 201 61 218/01, Heinemeyer, G. and Gundert-Remy, U., 2002)*
- *Child-specific safety factors when deriving limit values (Gundert-Remy, U., 2004)*

The findings of these projects were published along with other current literature in a **background paper** on the subject of “Environmental health risks – what are the differences between children and adults?” available as a pdf-

CHILDREN'S HEALTH IS ALSO A KEY ISSUE IN EUROPE

“The future for our children” was the motto of the Fourth Ministerial Conference on Environment and Health for the European Region of the World Health Organization (WHO) held in Budapest in June 2004.

The conference agreed a “Children’s action plan” and a comprehensive raft of measures. Based on these requirements, the individual countries will develop plans tailored to their national needs by 2007 and link them up with their own national action plans on the environment and health. Children are also the central focus of the German Action Programme Environment and Health (APUG), which was presented at the WHO conference in 1999. A number of measures agreed in Budapest have therefore already been included in the German action programme (further information at www.apug.de).

One of the important themes of the resolutions adopted at the conference is reducing contamination of the air by pollutants (indoor and outdoor air). Apart from tobacco smoke, the most significant pollutant sources indoors are emissions from building products and furnishings. For outdoor air, the

reduction of diesel soot and other sources of fine dust is a political task that must be given top priority. Another important goal in the catalogue of measures is to reduce the levels of chemicals, biological influences (such as mould) and noise that children are exposed to.



AND WHAT HAPPENS NEXT?

Internationally, children have an outstanding position in health-related environmental protection. Children's health is a major focus of activities in the field of the environment and health both at the European Commission and the World Health Organization (WHO). A European Action Plan for Children, Environment and Health was adopted by the Fourth Ministerial Conference on Environment and Health for the European Region of the World Health Organization (WHO) held in Budapest in June 2004.

Back in 1997, the environment ministers of the seven leading industrial nations, plus Russia (Group of Eight or G8) called for improved protection of children from environmental pollution (Declaration of the G8 Environment Ministers, Miami Declaration, 1997).

198 countries have signed the UN Convention on the Rights of the Child. This convention states that children have the right to the highest standard of health and health facilities and the right to a safe environment. Researching and protecting children against health risks from the environment is seen as a key responsibility now and in the future. For details of the conference and of the comprehensive catalogue of measures go to www.apug.de and click on "International."

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GLOSSARY: WHAT DOES THAT MEAN? TERMINOLOGY AND ABBREVIATIONS

Atopy	A tendency, often inherited, to develop eczema, hayfever or bronchial asthma as a response to certain environmental influences.
<i>Bedarfsgegenstände</i>	This is a term in German law defined as any substance or product that people have direct contact with. Examples include: packaging for food or cosmetics, personal care products, cleaning products, toys, to mention but a few. There is no direct equivalent in English.
DEHP	Abbreviation for diethylhexyl phthalate; the most significant of the phthalate compounds used to ensure flexibility (plasticisers) in many kinds of plastic; acute toxicity is low but the chronic intake of larger amounts seems to be a cause for concern; research into this is ongoing.
Diabetes mellitus	Metabolic disorder, sometimes referred to colloquially as “sugar diabetes” due to the high levels of blood sugar it causes and the excretion of sugar in the urine.
Flame retardants	Large number of different chemical compounds that reduce the fire risk of flammable substances; they include polybrominated biphenyls and diphenyl ethers; some of the flame retardants used have properties that are considered to be a significant cause for concern in toxicological and ecotoxicological terms.
Guideline value	Guideline values describe the concentration of a substance in environmental matrices.

Limit value	Legally binding value that may not be exceeded; a limit value is set by the legislative on the basis of scientific knowledge, taking into account social factors.
Musk compounds	Aromatic compounds that replicate the fragrance of musk, which was originally obtained from a secretion from the gland of the musk deer, but is now usually industrially synthesised; a number of synthetic musk compounds do not degrade readily and accumulate in the environment and in the food chain.
PAHs	Polycyclic aromatic hydrocarbons; found mainly in tar, crude oil and coal; formed during incomplete combustion of organic matter; widespread in the environment; many PAHs are carcinogenic.
PCBs	Polychlorinated biphenyls; these materials were widely used in the past but have been banned in Germany since 1989; PCBs do not degrade readily in the environment and accumulate in the food chain.
Plasticizers	Chemical compounds added to many types of plastic (e.g. PVC) to keep them flexible. See entry under DEHP.
Respiratory minute volume	Volume of air breathed in one minute; for adults at rest this is approx. 5–8 litres.

PHOTO CREDITS

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Federal Environment Agency: *page 20, 23 (top), 33*

WHO: *page 37*

ANNEX

List of Poisons Information Centres in Germany

Ort	Einrichtung	Vorwahl	Telefon-Nr.
Berlin	Giftnotruf Berlin Beratungsstelle für Vergiftungserscheinungen, Advice in cases of children being poisoned	030	1 92 40
Berlin	Charité-Universitätsmedizin Berlin Campus Rudolf Virchow (Treatment centre) Advice in cases of adults being poisoned	030	450 653 555
Bonn	Informationszentrale gegen Vergiftungen, Zentrum für Kinderheilkunde	0228	1 92 40
Erfurt	Gemeinsames Giftinformationszentrum Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt, Thüringen	0361	730 730
Freiburg	Informationszentrale für Vergiftungsfälle, Universitätskinderklinik Freiburg	0761	1 92 40
Göttingen	Giftinformationszentrum Nord der Länder Bremen, Hamburg, Niedersachsen, Schleswig-Holstein; Universitätsklinikum Göttingen	0551	1 92 40
Homburg/Saar	Informations- und Beratungszentrum für Vergiftungsfälle; Universitätskliniken für Kinder- und Jugendmedizin	06841	1 92 40
Mainz	Beratungsstelle bei Vergiftungen der Länder Rheinland-Pfalz und Hessen; Universität Mainz	06131	1 92 40
München	Giftnotruf München, Toxikologische Abteilung der II. Medizinischen Klinik	089	1 92 40
Nürnberg	Giftnotrufzentrale Nürnberg, II. Medizinische Klinik, Klinikum Nürnberg	0911	3 982 451

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