

Symposium on the German Health Survey for Children and Adolescents

Initial results

At a public symposium held on 25 September 2006, the Robert Koch Institute in Berlin presented the preliminary evaluation results of the National Health Survey for Children and Adolescents (KiGGS). Approx. 500 representatives of the science community, the public health service, health politicians, the media and the interested public had registered for this event. The abstracts of the presentations given there are published in the following. The double issue no. 5/6 2007 of the journal "Bundesgesundheitsblatt" will be used to present the full results of the KiGGS (see also <http://www.kiggs.de>).

Overview of facts and figures of the National Health Interview and Examination Survey for Children and Adolescents (KiGGS)

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From May 2003 till May 2006, the Robert Koch Institute conducted the National Health Interview and Examination Survey for Children and Adolescents (KiGGS). The aim of this nationwide, representative survey was to collect comprehensive data about the health status of children and adolescents in Germany, aged 0 to 17 years. The survey was financed by the Federal Ministry of Health (BMG) and the Federal Ministry of Education and Research (BMBF). The examinations were carried out by four teams, each lead by a physician. The teams visited 167 communities (sample points), which were representative for Germany. The examination programme was adapted according to age groups and consisted of a parental questionnaire and additionally a questionnaire for adolescents (ages 11 years and older), medical examinations and tests, a computer-based parental interview as well as a collection of blood and urine. Data was collected for the following topics: physical complaints and well-being, acute and chronic diseases, disabilities, health risks and accidents, mental health, quality of life, protective factors and personal resources, nutrition, eating disorders and obesity, health behaviour and leisure-time activities, medication use, vaccination status, use of medical facilities, anthropometry, motor abilities, visual abilities, blood pressure, blood and urine diagnostics as well as thyroid gland size (the latter being financed by the Federal Ministry of Food, Agriculture and Consumer Protection; BMELV).

The participants were randomly chosen from population registries for each sample point. The participation rate was 66.6 % and was therefore higher than in comparable surveys. Altogether 17,641 children and adolescents participated in the survey, among them 8,656 girls and 8,985 boys. The net sample showed a high representativity for the children and adolescent population of Germany, with 17% having a migration background and 2% being registered as disabled for example.

Additionally, the survey has three modules, which were financed respectively by cooperating institutions. In subsamples topics like "mental health" (BELLA; 2,863 participants), "motor fitness and physical activity" (MoMo; 4,529 participants) and "environmental exposures" (German Environmental Survey IV; 1,790 participants) were investigated in more detail. In addition, the Federal State Schleswig-Holstein used the possibility to collect additional data from 1,630 inhabitants aged 11 to 17 years, to enable representative statements about this age group within this Federal State (Schleswig-Holstein Module; 1,931 participants). A fifth

module, which started in January 2006 and will be completed in December 2006 investigates dietary behaviour more comprehensively (EsKiMo).

First results of the survey will be presented in more detail in a special edition of the *Bundesgesundheitsblatt*, May 2007. In October 2008 the data will be available as a public use file.

Keywords

Health survey - Children - Adolescents – Sample – Response - Representativity

The prevalence of overweight and obese children and adolescents living in Germany

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Obesity is an increasing problem: worldwide, for Germany and for children and adolescents. Until now there have been no representative and age-specific assessments of the distribution of obesity in this section of the German population. Data from, for example, examinations at the start of schooling does not aid conclusions for other age groups, and regional surveys cannot be extrapolated across the whole of Germany. So the height and weight measurements gathered by the National Health Interview and Examination Survey for Children and Adolescents (KiGGS) have, for the first time, provided national, representative data about obesity in young people.

Methods. Within the study height and weight of the participants were measured in a standardised way. The terms ‘overweight’ and ‘obese’ are defined according to the recommendations of the Arbeitsgemeinschaft Adipositas im Kindes- und Jugendalter (the Working Group for Obesity in Childhood and Adolescence) using the percentiles of the body mass index ($BMI = \text{weight in kg} / \text{height squared in m}^2$) of the Kromeyer-Hauschild reference system. The boundary for being overweight is set as the 90th percentile, i.e. the BMI value exceeded by 10% of the children of the same age and sex in the reference data set. Thus children with a BMI higher than this value are classified as overweight. They are classified as obese when their BMI exceeds the 97th percentile.

Results. Overall, 15% of children and adolescents between the ages of 3 and 17 are overweight, and 6.3% suffer from obesity. The proportion overweight rises from 9% of 3-6 year olds to 15% of 7-10 year olds and 17% of 14-17 year olds. The prevalence of obesity is 2.9%, 6.4% and 8.5% for the same groups respectively. No clear differences between boys and girls or between East and West Germany were detected. Children were at a higher risk of being overweight or obese if they had a lower socioeconomic status, had a migration background, had not been breastfed or had parents who were also overweight.

Perspectives. How these factors act together, and which factors are the decisive ones, will be the subject of further research using the KiGGS data. Moreover, the relevance of the problem to public health will become even clearer once the affects of obesity regarding blood pressure, cholesterol, blood sugar, subjective quality of life and psychological problems have been assessed, again using information from KiGGS.

Keywords

Health survey - Children - Adolescents –Eating disorders – Overweight – Obesity – Socioeconomic status - migrants

Eating disorders

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Eating disorders, such as anorexia nervosa, bulimia nervosa, obesity in combination with mental health problems, Binge Eating Disorder (BED; episodes of massive food intake without weight-reducing strategies) and other, atypical kinds, are among the most common health problems encountered in children and adolescents. Those affected vary considerably in their physical appearance and in the psychological nature of their disorder. Determining factors for eating disorders include sex, age and socio-economic status.

Methods. In total 7,498 boys and girls aged 11 to 17 were assessed using the SCOFF questionnaire, which screens for potential cases of eating disorders and has demonstrated high sensitivity towards anorexia nervosa, bulimia nervosa and other forms in general without, however, differentiating between them. To substantiate this data, further indicators such as BMI and self-rated body image were considered.

Results. Overall 21.9% of children and adolescents in the sample were identified as being at risk (28.9% of girls and 15.2% of boys). This prevalence rises from a base of about 20% for both sexes at the age of 11 to a rate of 30.1% in 17 year old girls, whereas for boys it declines to 12.8% by the same age. The rate in those with a low SES (27.6%) was almost twice as high as in those with a high SES (15.5%). Children and adolescents classified as at risk had higher rates of both general mental health problems and depressiveness. Collectively they were less satisfied with their self-rated body image, had a significantly higher proportion of smokers and reported more sexual harassment.

Conclusions. The results indicate the need, from early adolescence, for specific health advice on the causes and symptoms of eating disorders, coupled with the early detection of those at risk and wider provision of targeted support. At a scientific level, further studies should be undertaken to build on the work of KiGGS and improve differentiation between the eating disorders affecting children and adolescents. In this way, more specific methods will yield more exact diagnoses and reveal determining factors in the development of eating disorders.

Keywords

Anorexia nervosa - Bulimia nervosa - Binge Eating Disorder - Children - Adolescents – SCOFF – SES - Mental health problems - Body image

Allergic Diseases

M. Schlaud, W. Thierfelder

Allergic diseases are among the most commonly encountered health problems in children and adolescents. Until now, Germany has been without national, representative data that include laboratory results.

Methods. In the National Health Interview and Examination Survey for Children and Adolescents (KiGGS), data on the allergic diseases hay fever, atopic dermatitis and asthma were obtained using standardised interviews for parents conducted by trained doctors. Parents were asked whether their child had ever been diagnosed with one of these diseases by a doctor, whether the problem had been evident in the previous 12 months (termed ‘current’ below), and for further details on the condition. Blood samples were also taken, with parental consent, and tested for specific IgE antibodies against a variety of common antigens.

Results. On the basis of our data, 16.7% suffered from a current allergic disease, with more boys (18.0%) affected than girls (15.4%). The incidence of allergic diseases increased with age. Children from migrant families were less likely to be affected (13.0% against 17.6% in general), in common with children from deprived families (below average status 13.6%, average 17.8%, above average 18.9%). Allergic diseases were less frequent in children who had several older siblings or had been in close contact with other children in day-care facilities early in life. If their parents had allergies, the risk for children was more than doubled. In East Germany, allergic diseases were not less common than in West Germany. Differences between rural and urban areas were negligible.

Hay fever was diagnosed in 10.7% of study subjects at some point, with 8.9% currently affected, of whom more were boys (10.3%) than girls (7.5%). The prevalence of current hay fever increased with age from below 1% to more than 15%. Atopic dermatitis was diagnosed in 13.2% at some point, with 7.7% currently affected (roughly equally according to sex). Current atopic dermatitis tended to decrease with age. Asthma was diagnosed in 4.7% of children and adolescents at some point and 3.0% were currently affected, of whom, again, more were boys (3.5%) than girls (2.5%). The prevalence was slightly higher in urban (3.6%) than in rural areas (2.3%).

The blood tests revealed an atopic sensitisation to at least one common allergen in 40.8% of children/adolescents. Sensitisation to inhalative antigens (e.g. pollen, animal hair, dust mites) was 37.2%, compared to 20.2% for food allergens. Boys were more frequently (45.0%) sensitised than girls (36.4%). As age and social status rose, there was a continuous increase in the prevalence of atopic sensitisations. Children from migrant families were slightly less affected, and there was virtually no difference between East and West Germany or rural and urban areas.

Conclusions. The distribution of allergic diseases and sensitisations observed suggests that, aside from a hereditary component, lifestyle may be an important causal factor. Our findings accord with the 'hygiene hypothesis', which claims that reduced exposure to pathogenic germs or other antigens may increase the risk of allergies later in life.

Keywords

Health examination survey - Children - Adolescents – Allergies - Atopic dermatitis - Hay fever – Asthma - Atopic sensitisation

Thyroid Volume and Iodine Supply in Germany

M. Thamm, U. Ellert

Iodine deficiency is the leading cause of thyroid gland enlargement (goitre). Germany is still widely regarded as an endemically iodine-deficient area.

Methods. As part of a standardised medical examination, thyroid volume was measured by ultrasound in more than 11,000 children and adolescents between 6 and 17 years of age. This method is considered to be a very sensitive measure of individual iodine supply. In addition, to assess iodine supply at the population level in accordance with international recommendations, urinary iodine excretion was measured in spot urine samples. This data was complete for approximately 14,000 study participants.

Results. Overall, 2.4% of children examined exceeded the thyroid volume limit recommended by the WHO to date. Applying the considerably more stringent limit currently advised by a WHO working group (WHO/NHD Iodine Deficiency Study Group, 2004), a predominantly slight enlargement of the thyroid gland was observed in every third participant between 6 and 17 years of age. The frequency of thyroid gland enlargement increased with

age and girls were more commonly affected than boys. No correlation with socio-economic status, migration status or East-West differences could be observed. Taken by itself, such a slight enlargement has no clinical significance; instead it shows that the iodine supply is still suboptimal. This agrees with the observed distribution of urinary iodine excretion which was at the lower end of a range of 100-200 µg/l, indicating optimal iodine intake according to WHO criteria. Median iodine excretion was 117 µg/l, with only minor differences between the sexes.

Conclusions. Based on the results for urinary iodine excretion, Germany is not at present an explicit area of iodine deficiency. The application of very strict reference values to ultrasound measures of thyroid gland volume shows, however, the potential for further improvement.

Keywords

Health examination survey - Children - Adolescents – Iodine – Struma - Iodine deficiency

Sports participation and physical activity among children and adolescents in Germany

T. Lampert, A. Starker, G. B. M. Mensink

Regular physical activity has a positive impact on health and well-being at all ages. Measures promoting sport and other physical activities are therefore an established part of public health policy in Germany. The National Health Interview and Examination Survey for Children and Adolescents (KiGGS) has provided a national, representative database which permits to comprehensively analyse the physical activity of young people. This supports the planning and management of policy interventions.

Methods. The first analyses of children and adolescents physical activity were performed with data of the core survey of KiGGS (n=17.641), assessed with age specific instruments. Parents of children aged 3-10 were asked how often their children played outdoors or participated in sports. Adolescents (ages 11-17) were also asked about their physical activities during leisure time and their physical fitness. The data was analysed by sex, migration and socioeconomic status (SES).

Results. The majority of children aged 3-10 are active regularly: 77% play outdoors almost every day and 52% play sports at least once a week. No essential differences are observed between boys and girls. Exceptions are boys and especially girls from migrant families and those with a low SES, who tend to be insufficiently active. For instance, children from these groups are about 2 to 3 times less likely to regularly play sports.

Among adolescents (11-17 years), 84% take part at least once a week in activities that cause them to sweat or become out of breath. Around 23% take part in such activities almost every day. About 66% of adolescents rate their physical fitness as good or very good. In contrast to children, substantial differences in physical activity between sexes are seen among adolescents: girls are less often physical active during leisure time and have a lower rating of their fitness level. This is particularly evident among girls from migrant families and those with a low SES.

Conclusions. The results from KiGGS suggest most children and adolescents in Germany are physically active and take part in sports. Nevertheless, there is room for improvement in activity levels if the health of young people is to be safeguarded. Differences in activity behaviour specific to sex, ethnicity and SES indicate potential avenues for future health policy.

Keywords

The module „Motorik“: Motor Fitness and physical activity of children and young people

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Between 2003 and 2006, as part of the Motorik module, supported by the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (BMFSFJ), a representative cross-national sample of 4529 children and young people aged 4 to 17 was investigated for their motor fitness and physical activity. Participants' motor fitness was examined using eleven tests measuring cardio-respiratory fitness, strength, coordination and mobility. Physical activity was assessed using a questionnaire.

Results. Early results show that 95% of the participants are active during the questioning period, 22% citing a daily activity. On average, they took part in sporting activities four times a week for approximately 6 hours in total. Overall 58% were members of sports clubs. Membership increases between the ages of 6 and 10 before dropping back for 11 – 17 year old.

Concerning motor fitness, it was found that that more than a third of the participants were not able to balance while taking two or more steps backwards in a 3cm wide bar. On the trunk bend, 43% could not reach the level of their soles. The measurement of strengths by means of a standing long jump enabled comparison with data from 1976, and showed a deterioration of 14% over this period.

Conclusions. The findings emphasize the necessity of specific interventions. For this purpose further analyses especially of the association between motor fitness, physical activity and health are needed.

Keywords

Motor fitness - Physical activity - Children - Adolescents - Testing of motor fitness

German Environmental Survey 2003-06 (GerES IV)

M. Kolossa-Gehring, W. Babisch, R. Szewzyk, D. Ullrich

Methods. GerES IV is a module of KiGGS undertaken by the Federal Environment Agency. Exposure to chemical pollutants, mould spores and noise was examined using a representative sample of 1,790 children aged between 3 and 14. This involved the analysis of blood, urine, house dust and drinking water samples, a screening audiometry and a questionnaire identifying factors relevant to exposure.

Results. Because the Federal Environment Agency had already included children in GerES II (1990-92) subsequent trends in exposure levels can be identified. Exposure to lead, mercury, PAH and PCP has decreased markedly as a result of environmental and health policies.

Exposure to second-hand smoke did not decrease, however. In both surveys around 50% of children were living in households with at least one smoker. Urinary cotinine levels suggest exposure to second-hand smoke may even have increased. In almost half the households in which smoking occurred daily the future EU limit for benzene in outdoor air was exceeded in the indoor air.

GerES IV will continue to examine links between environmental conditions and health. Around 10% of children have been shown to be sensitive to at least one of the mould spores analysed. Of the spores included in GerES, most are principally encountered in an indoor environment and are not covered by routine allergy screening tests. In the hearing test, around 13% of children showed a loss of more than 20dB, and 2.4% more than 30dB, in at least one of the frequencies measured. Noise from leisure activities is one potential cause of this hearing impairment.

Acknowledgement. The financial support of the Federal Ministries for the Environment, Nature Conservation and Nuclear Safety and of Education and Research is gratefully acknowledged. Field work during GerES IV was carried out by the Robert Koch Institute, Berlin.

Keywords

Health and environmental survey- Children- GerES – Lead – Mercury – Cotinine – Benzene – PAH – PCP – Mould - Indoor environment - Hearing impairment

Mental Health Module (BELLA Study)

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The “Mental Health” module of the National Health Interview and Examination Survey for Children and Adolescents (KiGGS) carried out by the Robert Koch Institute is an examination of emotional wellbeing and behaviour. This so-called BELLA Study, sponsored by the Stifterverband für die Deutsche Wissenschaft (Association of Donors for German Science), observes the occurrence of both general and specific mental health problems in children and adolescents in Germany.

Methods. In the BELLA Study, 2863 families with children between the ages of 7 and 17 years, who had taken part in KiGGS, were interviewed over the telephone using a standardised computer-assisted telephone interview (CATI) immediately followed by a postal survey.

The prevalence of mental health problems was determined using the responses to the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) and further standardised screening measures.

Results. Approx. 22 % of the children and adolescents studied show signs of mental health problems, whereby about 10 % of all children and adolescents achieve scores which are in the abnormal range. Among the specific psychiatric disorders, anxiety (7.6%), conduct disorder (10%) and depression (5.4%) are the most common. Among the assumed risk factors, an adverse family climate with many conflicts and low socio-economic status stand out particularly as negative contributors and are associated with up to a 4-fold increase in the probability of mental health problems.

When several risk factors occur simultaneously, a high increase in the prevalence of mental health problems is observed (constituting up to 50% in high-risk groups). Conversely, positive individual, family and social resources are more pronounced in children and adolescents without signs of mental health problems. The health-related quality of life of children and adolescents who are conspicuous in terms of their emotional well-being and behaviour is distinctly impaired in all areas. Far from all children and adolescents displaying mental health problems are receiving the appropriate treatment.

Conclusions. The BELLA Study shows that in order to identify high-risk groups, it is not only important to look at the usual risk factors for the mental and subjective health of children and adolescents, but also to assess the existing individual, family and social resources. Strengthening the individual and family resources of children and adolescents should be a key objective, both in prevention and in intervention.

Keywords

Mental health - Children - Adolescents - Protective factors - Risk factors

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