DIABETES surveillance

ROBERT KOCH INSTITUT

Physical inactivity

Field of action 1: Reducing the risk of diabetes

Children and adolescents

Background

Physical activity includes any physical movement produced by the skeletal muscles that leads to an increase in energy expenditure above the basal metabolic rate [1]. During childhood and adolescence, regular physical activity is important for physical health [2]. For example, physically inactive children and adolescents have a less favourable cardiovascular risk profile compared to physically active ones [3]. In addition, longitudinal studies show that an inactive lifestyle acquired in childhood and adolescence often continues into adulthood, increasing the risk of developing non-communicable diseases such as type 2 diabetes [4]. The World Health Organization (WHO) therefore recommends that 3- to 17-year-old girls and boys undertake an average of at least 60 minutes of moderate to very strenuous physical activity per day [5]. The WHO has thus updated its recommendation, valid since 2010, according to which children and adolescents should still engage in at least 60 minutes of moderate to very strenuous physical activity per day [6]. The indicator physical inactivity is based on the WHO's 2010 minimum recommendation and describes the proportion of 3- to 17-year-old girls and boys who are not physically active for at least 60 minutes per day in a moderate to very strenuous way.

Key messages

- In 2015, almost three quarters of children and adolescents are physically inactive.
- Girls are more likely to be physically inactive than boys, and the prevalence of physical inactivity increases with age.
- There are no differences between children and adolescents in terms of physical inactivity by education group.

Figure 1: Temporal development of the prevalence of physical inactivity in % among children and adolescents (3-17 years) by sex between 2010 and 2015.

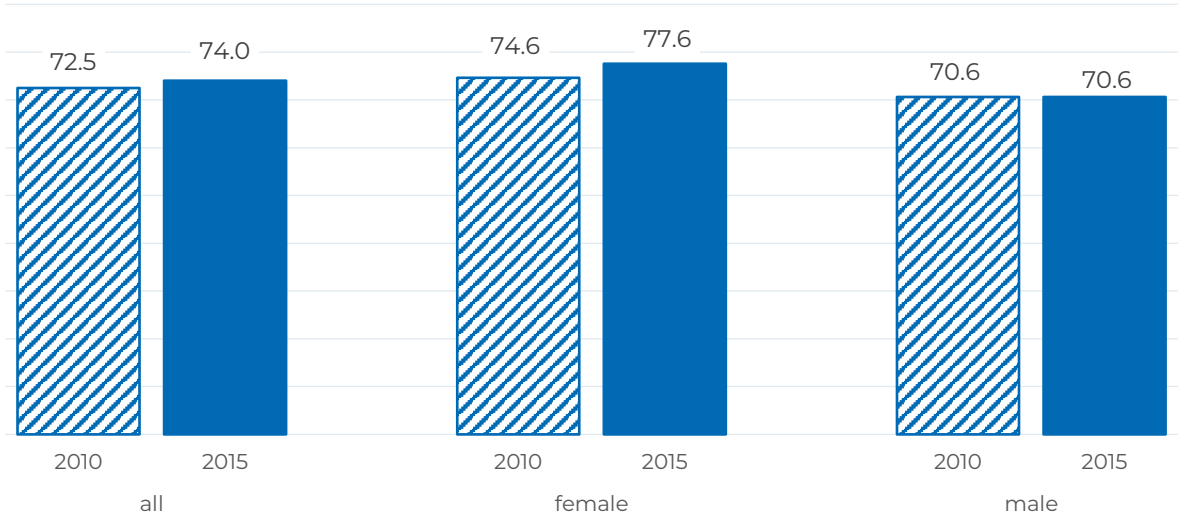


Figure 2: Prevalence of physical inactivity in % among children and adolescents (3-17 years) in 2015 by age and sex.

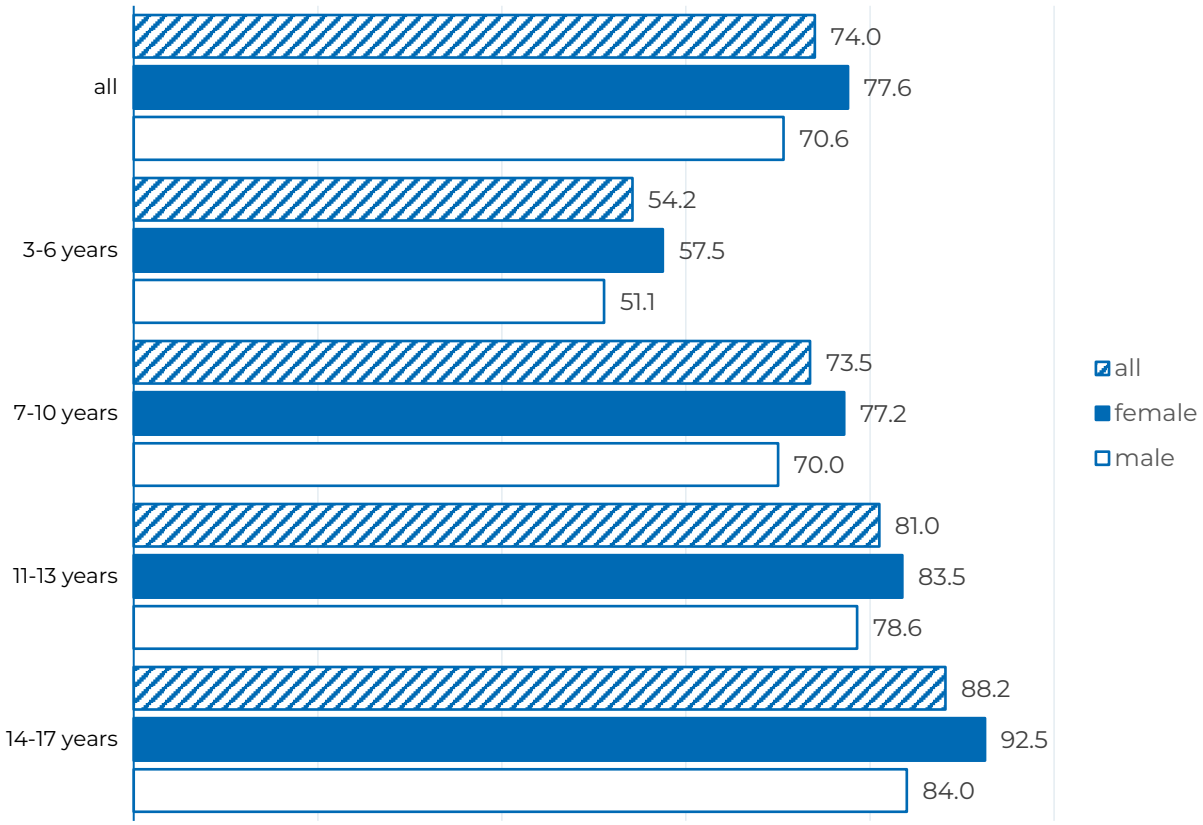


Figure 3: Prevalence of physical inactivity in % among children and adolescents (3-17 years) in 2015 by education group and sex.

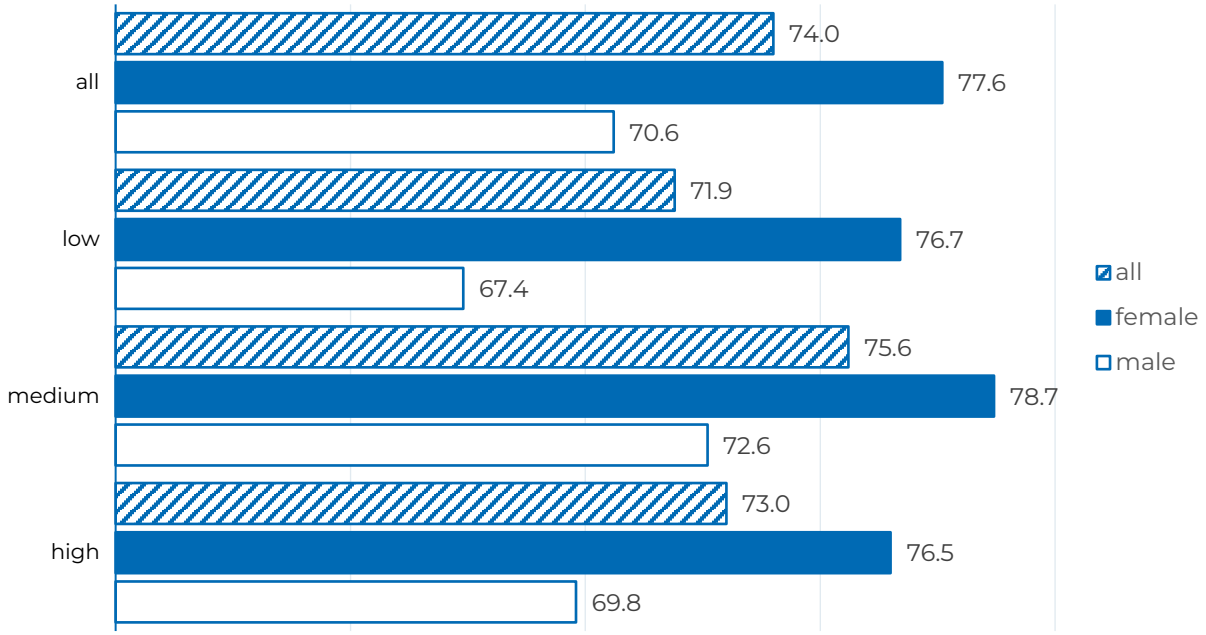
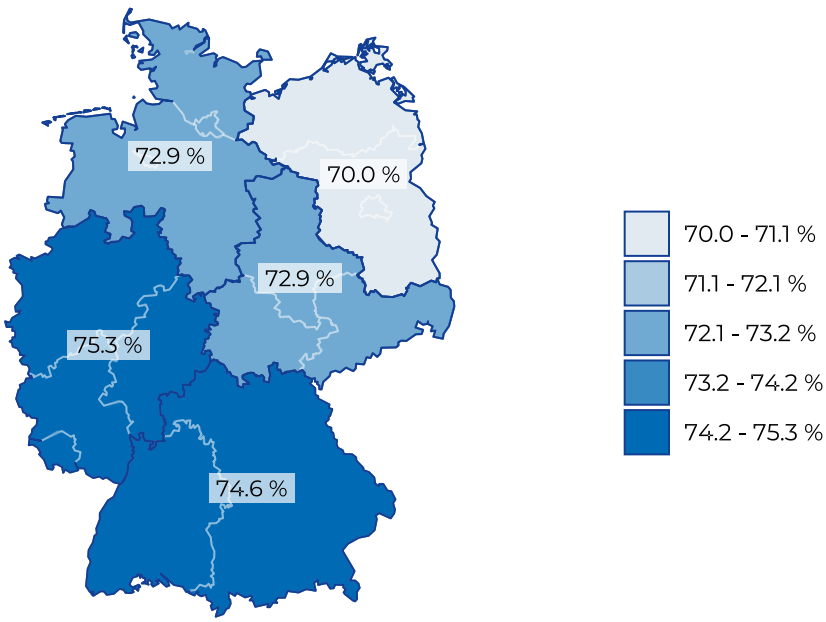


Figure 4: Prevalence of physical inactivity in % among children and adolescents (3-17 years) in 2015 by region (north east, north west, middle east, middle west, south).



Results

In 2015, the prevalence of physical inactivity among children and adolescents was 74.0% (girls: 77.6%; boys: 70.6%). The proportion of physically inactive children and adolescents increases with age, from 54.2% among 3- to 6-year-olds to 88.2% among 14- to 17-year-olds. There are also

differences in physical inactivity by region of residence: children and adolescents in the middle west are more likely to be physically inactive than their peers in the north east (75.3% and 70.0%, respectively). There are no differences in physical inactivity between different education groups (low: 71.9%, medium: 75.6%, high: 73.0%). Compared to 2010, the proportion of physically inactive children and adolescents has stagnated in 2015.

Conclusion

Data from German Health Interview and Examination Survey for Children and Adolescents (KiGGS) Wave 2 demonstrate that almost three quarters of children and adolescents are physically inactive at a young age [7]. No differences were identified between education groups. Analyses based on data from KiGGS Wave 1 (2009-2011), however, suggest that children and adolescents from families in the high socio-economic status group are more often active in sports and members of sports clubs than children and adolescents in the low socio-economic status group [8]. An important goal, therefore, should be to further expand measures that promote physical activity in childhood and adolescence, as envisaged in the National Recommendations for Physical Activity and for Physical Activity Promotion [9].

Methodology and data sources

Definition

The indicator physical inactivity is defined as the proportion of children and adolescents who do not achieve the World Health Organization's (WHO) recommendation of at least 60 minutes of physical activity per day.

Operationalisation

The variable is based on self-reported data (from 11- to 17-year-olds) or their parents/guardians (for 3- to 10-year-olds) on physical activity in leisure time.

- *"How many days in a normal week are you/is your child physically active for at least 60 minutes a day?"*
  - Numbers provided range from 0 to 7 days

Reference population

Children and adolescents with permanent residence in Germany, aged 3-17 years.

Data source

Nationwide interview and examination survey of the Robert Koch Institute (RKI) from 2014-2017 (KiGGS Wave 2) based on a registry office sample. Data was collected using self-completed questionnaires (survey of parents as well as children and adolescents aged 11 or above), a medical interview (parental survey) and an examination. Nationwide RKI telephone survey 2009-2012 (KiGGS Wave 1) based on a registry office sample. Data was collected using a computer-assisted telephone interview (survey of parents as well as children and adolescents aged 11 or above).

Number of cases

- KiGGS Wave 1 (cross-sectional survey): n = 12,368 (of which n = 4,455 0- to 6-year-olds invited for the first time, n = 7,913 7- to 17-year-olds who have already participated in the KiGGS baseline study)
- KiGGS Wave 2 (cross-sectional survey): n = 15,023 (of which 3,567 underwent an examination)

Calculation

- **Description:** For the indicator, the figures for total, girls and boys are provided and stratified by age group, residential area and parental education as far as the number of cases available for the figure is ≥5 and the statistical uncertainty in the estimate of the indicator is not considered too large (a coefficient of variation ≤ 33.5%).
- **Stratification**: The geographical classification of the residence of the participating person was carried out by region (north east, north west, middle east, middle west and south). Educational status of the parents was determined using the Comparative Analysis of Social Mobility in Industrial Nations (CASMIN) index, which takes information on both school and vocational training into account and allows a categorisation into a low, medium and high education group.
- **Weighting:** In order to correct for deviations from the underlying reference population due to different participation rates or sampling probabilities, weighting factors were used when calculating the indicator. These adjust the surveys to the population structure of the reference population with regard to sex, age, federal state and German citizenship (yes/no) as of 31 December 2010 (KiGGS Wave 1) and as of 31 December 2015 (KiGGS Wave 2) as well as to the distribution of parental education in the microcensus 2009 (wave 1) and 2013 (wave 2). In KiGGS Wave 1, the weighting also took into account the different probability of participation of re-participants from the KiGGS baseline survey.

Data quality

The RKI surveys for children and adolescents provide representative results for the 0- to 17-year-old resident population in Germany. Various measures (including oversampling of children and adolescents without German citizenship), enabled migrants to be included in the KiGGS sample approximately in line with their proportion of the population. Nevertheless, further efforts are necessary in the future, especially for children and adolescents with little knowledge of German.

Data download

Robert Koch Institute. (2024). Results of the National Diabetes Surveillance 2015 – 2024 [Data set]. Zenodo. https://doi.org/10.5281/zenodo.14935276 (in German)

References

1. Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. Public Health Rep. 1985;100(2):126-31.
2. Janssen I, Leblanc AG. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. Int J Behav Nutr Phys Act. 2010;7:40. doi: 10.1186/1479-5868-7-40.
3. Hallal PC, Victora CG, Azevedo MR, Wells JC. Adolescent physical activity and health: a systematic review. Sports Med. 2006;36(12):1019-30. doi: 10.2165/00007256-200636120-00003.
4. Telama R. Tracking of physical activity from childhood to adulthood: a review. Obes Facts. 2009;2(3):187-95. doi: 10.1159/000222244.
5. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. Br J Sports Med. 2020;54(24):1451-62. doi: 10.1136/bjsports-2020-102955.
6. World Health Organization (WHO). Global recommendations on physical activity for health. 2010 [cited 06.02.2025]. Available from: https://www.who.int/publications/i/item/9789241599979.
7. Finger JD, Varnaccia G, Borrmann A, Lange C, Mensink G. Physical activity among children and adolescents in Germany. Results of the cross-sectional KiGGS Wave 2 study and trends. J Health Monit. 2018;3(1):23--30. doi: 10.17886/RKI-GBE-2018-023.2.
8. Manz K, Schlack R, Poethko-Müller C, Mensink G, Finger J, Lampert T. Körperlich-sportliche Aktivität und Nutzung elektronischer Medien im Kindes- und Jugendalter. Bundesgesundheitsbl. 2014;57(7):840–8. doi: 10.1007/s00103-014-1986-4.

9. Rütten A, Pfeifer K. Nationale Empfehlungen für Bewegung und Bewegungsförderung. Köln; 2017 [cited 26.11.2024]. Available from: https://shop.bzga.de/sonderheft-03-nationale-empfehlungen-fuer-bewegung-und-bewegungsfoerd-60640103/.

External links

- Robert Koch Institute. Information on the study German Health Interview and Examination Survey for Children and Adolescents (KiGGS) 2024 [cited 30.01.2025]. Available from: http://www.rki.de/kiggs.

Imprint

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