

Sugar-sweetened beverages



Field of action 1: Reducing the risk of diabetes



Children and adolescents

Background

Sugar-sweetened beverages such as lemonades and fruit drinks contain industrially added sugar and thus usually have a high energy content and a high glycaemic index with a low satiety effect. These drinks should be distinguished from beverages sweetened with sugar substitutes and from fruit and vegetable juices containing natural fructose [1, 2]. Studies indicate that the regular consumption of sugar-sweetened beverages in childhood and adolescence is associated with adverse health effects such as overweight, obesity (indicator “overweight and obesity”) and insulin resistance [3]. Dietary habits developed at a young age often persist into adulthood and adults who regularly consume a large amount of sugar-sweetened beverages are at a higher risk of developing type 2 diabetes [4].

Key messages

- ▶ Overall, around a quarter of adolescents drank sugar-sweetened beverages at least once a day in 2015.
- ▶ Boys drink sugar-sweetened beverages on a daily basis more often than girls, with consumption increasing in both sexes between the ages of 3 and 17 years.
- ▶ Children and adolescents in the lower education group drink sugar-sweetened beverages on a daily basis more than three times as often as their peers in the higher education group.

Figure 1: Temporal comparison of the proportion of persons in the population (3 – 17 years) who consume sugar-sweetened beverages in % by sex between 2004 and 2015.

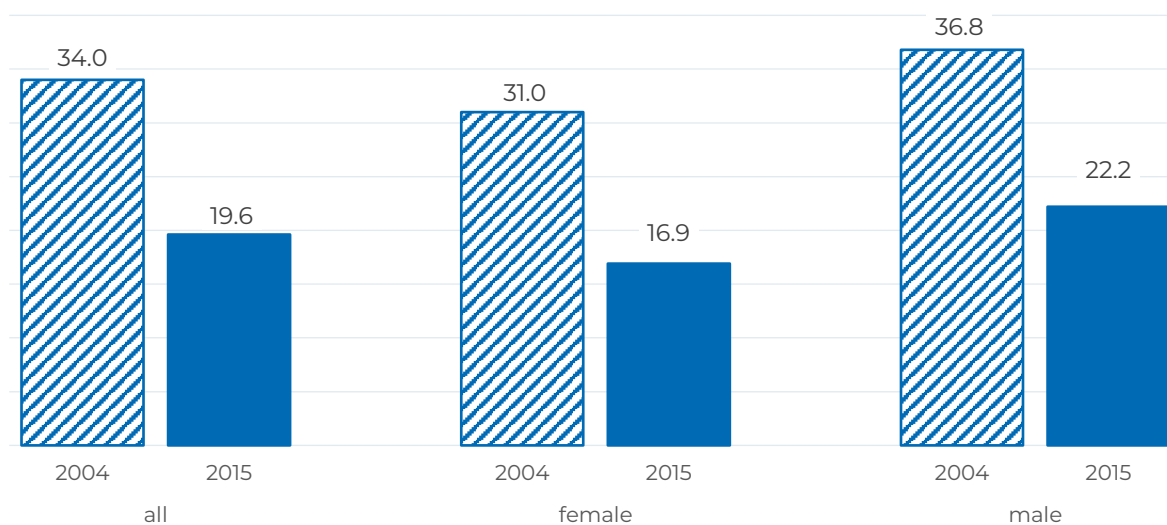


Figure 2: Proportion of persons in the population (3 – 17 years) who consume sugar-sweetened beverages in % by age and sex in 2015.

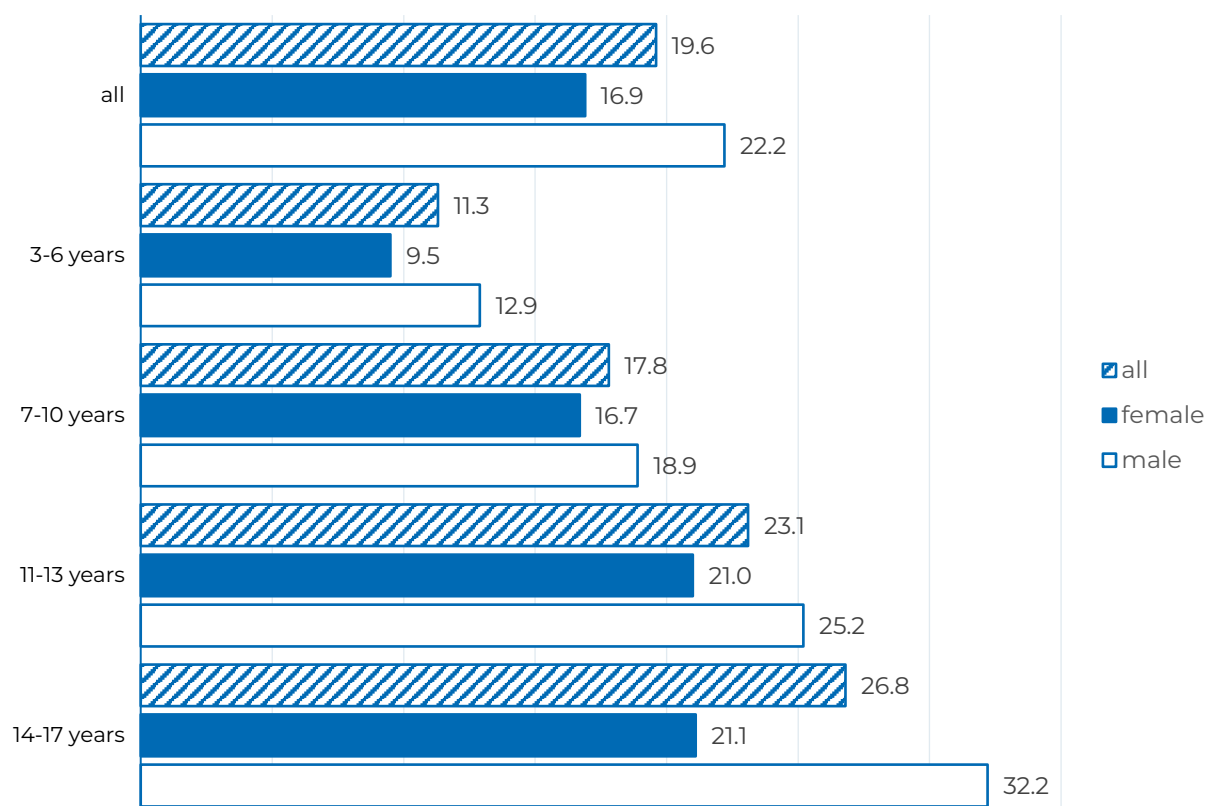
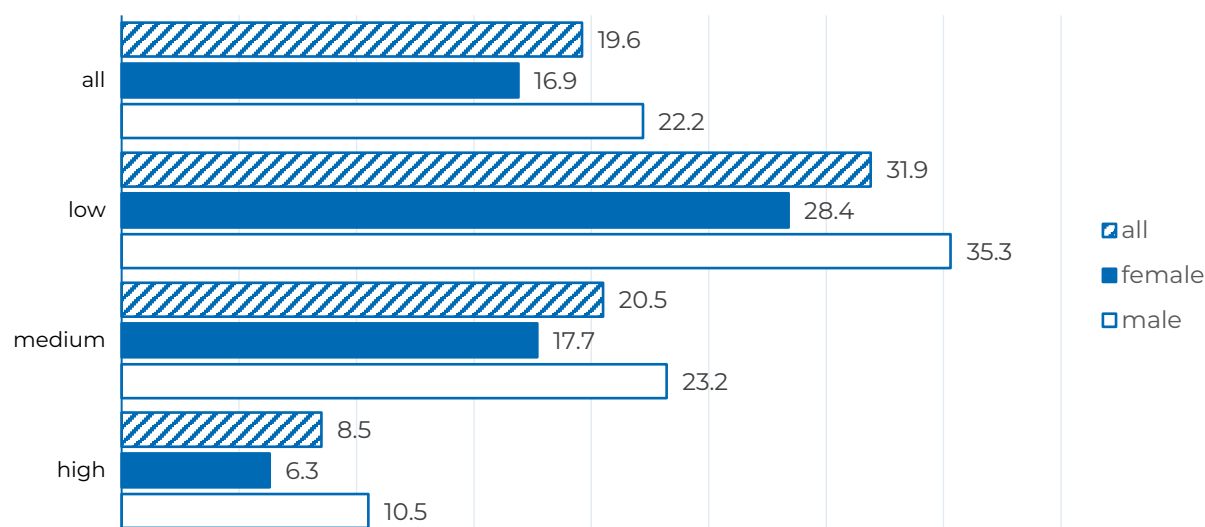


Figure 3: Proportion of persons in the population (3 – 17 years) who consume sugar-sweetened beverages in % by education group and sex in 2015.



Results

In 2015, 19.6% of children and adolescents drank sugar-sweetened beverages on a daily basis (girls: 16.9%; boys: 22.2%). The proportion rises with increasing age, from 11.3% among 3- to 6-year-olds to 26.8% among 14- to 17-year-olds. Children and adolescents in the lower education group drink sugar-sweetened beverages on a daily basis more often (31.9%) than those in the middle and higher education group (20.5% and 8.5%). No differences were identified by region. Compared to 2004, a smaller proportion of children and adolescents drink sugar-sweetened beverages every day.

Conclusion

Between 2004 and 2015, the proportion of children and adolescents who consumed sugar-sweetened beverages on a daily basis decreased; however, more than one in ten 3- to 6-year-old children and more than one in four 14- to 17-year-olds in Germany drink sugar-sweetened beverages once or several times a day [5, 6]. Sugar-sweetened beverages, therefore, are a modifiable risk factor for the later development of type 2 diabetes. Furthermore, they demonstrate clear potential for prevention through behaviour- and context-based measures. The differences identified by education for daily consumption of sugar-sweetened beverages indicate the need to establish measures in all population groups.

Methodology and data sources

Definition

The indicator sugar-sweetened beverages is defined as the proportion of children and adolescents in the population who consume sugar-sweetened beverages daily.

Operationalisation

The consumption of sugar-sweetened beverages is assessed using self-reported data collected using a food frequency questionnaire:

German Health Interview and Examination Survey for Children and Adolescents (KiGGS) baseline study:

- ▶ “How often have you drunk sugar-sweetened beverages (e.g. cola, lemonade, iced tea, malt beer) in the last few weeks?”
 - Never
 - Once a month
 - 2-3 times a month
 - 1-2 times a week
 - 3-4 times a week
 - 5-6 times a week
 - Once a day
 - 2-3 times a day
 - 4-5 times a day
 - More than 5 times a day

KiGGS baseline study Wave 2:

- ▶ “How often have you drunk sugar-sweetened beverages (e.g. cola, lemonade, iced tea, malt beer, energy drinks) in the last few weeks? Do not include diet beverages.”
 - Never
 - Once a month
 - 2-3 times a month
 - 1-2 times a week
 - 3-4 times a week
 - 5-6 times a week
 - Once a day
 - 2 times a day
 - 3 times a day
 - 4-5 times a day
 - More than 5 times a day

Reference population

Children and adolescents aged between 3 and 17 with permanent residency in Germany.

Data source

Nationwide interview and examination survey 2014 – 2017 (KiGGS baseline study Wave 2) of the Robert Koch Institute (RKI) based on a registry office sample. Data was collected using self-completed questionnaires (questioning the parents as well as the children and adolescents as of 11 years of age), a medical interview (questioning the parents) and an examination.

Number of cases

- ▶ KiGGS baseline study Baseline: n = 17,641
- ▶ KiGGS baseline study 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 $\leq 33.5\%$).
- ▶ **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 2004 (KiGGS baseline) and 31 December 2015 (KiGGS Wave 2) as well as to the distribution of parental education in the microcensus 2005 (baseline survey) and 2013 (wave 2).

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 study 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. Deutsche Gesellschaft für Ernährung e. V. Gut essen und trinken – Der DGE-Ernährungskreis 2019 [cited 12.08.2024]. Available from: <https://www.dge.de/gesunde-ernaehrung/gut-essen-und-trinken/dge-ernaehrungskreis/>.
2. Malik VS, Hu FB. Sugar-Sweetened Beverages and Cardiometabolic Health: An Update of the Evidence. *Nutrients*. 2019;11(8). doi: 10.3390/nu11081840.
3. Bleich SN, Vercammen KA. The negative impact of sugar-sweetened beverages on children's health: an update of the literature. *BMC Obes*. 2018;5(1):6. doi: 10.1186/s40608-017-0178-9.
4. Imamura F, O'Connor L, Ye Z, Mursu J, Hayashino Y, Bhupathiraju SN, et al. Consumption of sugar sweetened beverages, artificially sweetened beverages, and fruit juice and incidence of type 2 diabetes: systematic review, meta-analysis, and estimation of population attributable fraction. *BMJ*. 2015;351:h3576. doi: 10.1136/bmj.h3576.
5. Mensink G, Kleiser C, Richter A. [Food consumption of children and adolescents in Germany. Results of the German Health Interview and Examination Survey for Children and Adolescents (KiGGS)][Article in German] *Bundesgesundheitsbl*. 2007;50: 609–23. doi: 10.1007/s00103-007-0222-x.
6. Mensink G, Schienkiewitz A, Rabenberg M, Borrmann A, Richter A, Haftenberger M. Consumption of sugary soft drinks among children and adolescents in Germany. Results of the cross-sectional KiGGS Wave 2 study and trends. *J Health Monit*. 2018;3(1):31-7. doi: 10.17886/RKI-GBE-2018-024.

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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