Journal of Health Monitoring

Health behaviour of adults in Germany – Results from GEDA 2019/2020-EHIS
Index

Health behaviour of adults in Germany –
Results from GEDA 2019/2020-EHIS

3 Editorial Health behaviour in Germany –
on-going cause for concern!

6 Focus Smoking behaviour and passive smoke
exposure of adults – Results from
GEDA 2019/2020-EHIS

21 Fact sheet Overweight and obesity among adults in
Germany – Results from GEDA 2019/2020-EHIS

29 Fact sheet How much do adults sit? Results from the
German Health Update (GEDA 2019/2020-EHIS)
Health behaviour in Germany – ongoing cause for concern!

The health risks associated with overweight and obesity as well as their worldwide increasing prevalence have been known for decades. Before the term ‘pandemic’ became synonymous with the spread of COVID-19 to the public, the terms ‘obesity pandemic’ or ‘adiposity epidemic’ were widely discussed in the media. Did the high awareness for the topic of overweight also lead to a turnaround in the pervasiveness of overweight and adiposity? Schienkiewitz et al. analyse data from the nationwide survey GEDA (German Health Update) from 2019 and 2020, and the results are sobering: Compared to earlier surveys from 2012, they show a consistently high prevalence of overweight (approximately 47% of all women, 61% of all men), a slight increase to 19% for both sexes has even been reported in the case of adiposity. The news is thus still worrying. This is all the more alarming as the COVID-19 pandemic has tragically highlighted the particular vulnerability of people affected with overweight and adiposity – an excessive BMI represents a risk factor for severe illnesses among people who got infected with SARS-CoV-2. ‘Heavy Times’ is used as the title of an article in the magazine ‘Die ZEIT’ from July of 2021, and further: ‘Where overweight and obesity are widespread, particularly large numbers of people die during the Corona crisis.’ In addition, there are observations that the mitigation measures implemented in the pandemic have promoted the increase of overweight in large sections of the population. The COVID-19 pandemic thus magnifies that not only a continuous nationwide monitoring of the BMI is necessary, but also the prevention and treatment of overweight and obesity.

Lifestyle plays an important role in the development of overweight, with a poor balance between energy intake and expenditure being critical for weight gain. In the life of many people, intensive sports regimen come short, but also low-impact physical activity is missing from daily routines, such as riding a bike, walking, or climbing stairs. At work, during leisure time, and even when covering distances, people mostly sit – at the table, on the couch, or in the car. Our society is characterised by a sedentary lifestyle. In recent years, prolonged periods of sitting have been described as independent risk factor for the development of various chronic diseases. The negative results of sitting can most likely only be compensated by extremely long periods of physical activity during the day. This is reason enough to add the question about time spent sitting in the GEDA 2019/2020-EHIS survey for the first time. Manz et al. show that every day, people in Germany cumulate a significant amount of time that is spent in the sitting or lying position – in addition to sleeping. 17% of women and 22% of men sit or lie more than eight hours a day. What is unusual about this: In contrast to most of the other health-related risk factors, such as tobacco smoking or poor diet, this particularly affects the higher education groups. This may be due to the fact that certain professions or clerical work are represented more frequently in higher education groups. There are no suggestions yet with regard to an upper limit or a maximum ‘dose’ for periods of sitting. It can nonetheless be assumed that a significant proportion of the adult population in Germany endangers its own health because of long periods of sitting, combined with...
Health behaviour in Germany – ongoing cause for concern!

little movement. This is why the awareness that sitting is a health-related risk factor must be strengthened – among the general population as well as among those professionals, who are responsible for designing learning and working environments. When spending time at the office, at university or at school, people have to be given the opportunity to stand (up), to interrupt periods of sitting, to work while standing, as well as to design their breaks in an active and mobile manner.

Contrary to the comparatively ‘new’ risk factor of sitting, the substantial health risks of tobacco smoking are well-known to almost all people, and have been for many years. However, the smoking rate in Germany is still high, as reported by Starker et al. in their Focus article in this issue: Approximately a third of all men and a quarter of all women smoke at least occasionally. Especially in the low education group, the percentage of smokers is higher. Add to this 8% of the non-smoking population affected by passive smoking. The goal that less than five percent of adults consume tobacco products by the year 2040 is still far away. The ‘Strategy for a tobacco-free Germany 2040’ published last year set this ambitious target. It also names ten concrete political measures, including partial steps for their implementation, to make cigarette smoking more difficult and to promote quitting smoking. There is in fact still significant leeway in the implementation of measures. Even though the inception of the Non-Smoker’s Protection Act 2007 was an important milestone in the German tobacco control policy, Germany nonetheless lags behind other European countries in the implementation of regulatory measures. The Corona pandemic also shows an effect on the tabaco consumption: On the one hand, there are smokers who reported having used the pandemic to quit smoking. On the other hand, there is a proportion of smokers who report they consume even more tobacco than before – possibly promoted by pandemic-related mental stress and worries or enhanced by working from home. This is one more reason not to neglect smoking as the most important behavioural risk factor to health.

The data in this issue show an unabatedly urgent need for action for prevention in order to mitigate the important risk factors for malignant and cardiovascular diseases. Regardless of whether dealing with maintaining normal weight, avoiding prolonged sitting, or not smoking: What is crucial is to design the environments and settings in Germany in such a way that protecting his or her health is made easy for everyone.

Corresponding author
Prof Dr Julika Loss
Robert Koch Institute
Department of Epidemiology and Health Monitoring
General-Pape-Str. 62–66
12101 Berlin, Germany
E-mail: LossJ@rki.de

Please cite this publication as
Loss J (2022)
Health behaviour in Germany – ongoing cause for concern!
DOI 10.25646/10289

The German version of the article is available at:
www.rki.de/journalhealthmonitoring
Health behaviour in Germany – ongoing cause for concern!

Imprint
Journal of Health Monitoring
www.rki.de/journalhealthmonitoring-en

Publisher
Robert Koch Institute
Nordufer 20
13353 Berlin, Germany

Editorial Office
Department of Epidemiology and Health Monitoring
Unit: Health Reporting
General-Pape-Str. 62–66
12101 Berlin, Germany
Phone: +49 (0)30-18 754-3400
E-mail: healthmonitoring@rki.de

Editor-in-Chief
Dr Thomas Ziese,
Deputy: Dr Anke-Christine Saß

Editors
Dr Martina Groth, Johanna Gutsche, Dr Birte Hintzpeter,
Dr Franziska Prütz, Dr Alexander Rommel, Dr Livia Ryl,
Dr Anke-Christine Saß, Stefanie Seeling, Simone Stimm

Typesetting
Katharina Behrendt, Alexander Krönke, Kerstin Möllerke

Translation
intellitext SprachenService

ISSN 2511-2708

Note
External contributions do not necessarily reflect the opinions of the
Robert Koch Institute.

The Robert Koch Institute is a Federal Institute within
the portfolio of the German Federal Ministry of Health
Smoking behaviour and passive smoke exposure of adults – Results from GEDA 2019/2020-EHIS

Abstract

Background: Smoking is a significant health risk and the leading cause of premature death. Passive smoke causes the same negative effects on health as smoking, albeit to a lesser extent. The reduction of tobacco consumption and the protection against passive smoke are thus important health objectives.

Methods: The study German Health Update (GEDA 2019/2020-EHIS) is a cross-sectional telephone survey (04/2019 to 09/2020) of the resident population in Germany with questions relating to the current smoking behaviour and relating to the passive smoke exposure. The analysis sample comprises 22,708 persons from 18 years of age.

Results: 24.0% of women and 33.9% of men from 18 years of age smoke currently, at least occasionally. Among both sexes, adults from 65 years of age smoke significantly more rarely than adults in the younger age groups. 4.1% of adults, who do not smoke themselves, are subjected daily to passive smoke exposure indoors. This affects in particular young adults and men. There are educational differences in tobacco consumption and in passive smoke exposure to the disadvantage of adults from lower educational groups.

Conclusions: In Germany, there is still a need for action for effective measures for tobacco prevention, smoking cessation and tobacco control policy, which are effective in all population groups and which take into account the concerns of socially disadvantaged groups.

1. Introduction

In the industrialised nations, smoking tobacco is the most significant avoidable health risk and the leading cause of premature death [1]. Cardiovascular, respiratory and cancer diseases occur to an greater extent among smokers. For instance, approximately 15% of all cancers in Germany are attributed to smoking [2]. Lung cancer is thereby the most common tobacco-associated cancer. However, malignant growths on lips, oral cavity, pharynx, oesophagus, larynx and the efferent urinary tract are considered to be tobacco-related diseases. For these cancer diagnoses, at least one-third of all cases in Germany can be attributed to tobacco consumption. Furthermore, smoking has a negative effect on the immune system, metabolism, skeleton, periodontium, eyes and fertility [3]. According to estimates, approximately 127,000 people died as a result of smoking in Germany in 2018 [4]. The costs for treating illnesses and health
problems of smoking-related diseases were estimated to be approximately 30 billion euros [5].

Smoking tobacco does not only have negative health consequences for the smokers themselves, but also for persons, who are subjected to a passive smoke exposure. The composition of the tobacco smoke in the ambient air hardly differs from the cigarette smoke, which is inhaled when actively smoking [6]. This is why passive smoking has the same negative health consequences as tobacco smoking, albeit to a lesser extent [7]. Due to the fact that tobacco smoke deposits on surfaces, and harmful substances are released into the ambient air again from there, thirdhand smoke is also responsible for a passive smoke exposure [8]. Due to their increased breathing rate [9] and the not yet fully-developed detoxification system [10], children are particularly at risk when they are confronted with tobacco smoke. Passive smoking during pregnancy endangers the healthy development of the embryo, and passive smoke increases the risk for the sudden infant death among babies [11]. The cost of illness expenses for the passive smoke exposure for persons who live in the same household as smokers, are currently estimated to be 1.3 billion euros per year [12]. The most recently available estimation for the passive smoke-related mortality in Germany from 2003 assumes 3,300 yearly cases of death [7]. It is assumed that the federal and state non-smoking acts enacted since 2007 have contributed to the reduction of the passive smoke exposure and the consequences thereof [1].

In light of the foregoing, the long-lasting and target group-specific reduction of the tobacco consumption including the reduction of the passive smoke exposure represents an important health objective. Since the early 2000s, Germany has been launching various measures to reduce the tobacco consumption among the public, for example multi-level tobacco duty increases or federal and state non-smoking acts. In contrast to other countries, however, Germany does not have a strategy for a long-lasting tobacco control [13], such as, for example, Finland [14], England [15] or Ireland [16]. This is why in 2021, the German Cancer Research Centre (DKFZ), together with more than 50 further health organisations, presented a ‘strategy for a tobacco-free Germany 2040’ [17] with the objective that fewer than five percent of adults and fewer than two percent of adolescents consume tobacco products or electronic cigarettes by then. Currently, however, a comparatively large percentage of adults still smoke and there is still a need for effective measures to curb the tobacco consumption.

To be able to assess current developments and trends in the smoking behaviour and the passive smoke exposure among the public, a frequent monitoring using studies that are representative nationwide is required. The present article thus describes current cross-sectional results on smoking behaviour and passive smoke exposure of adults from GEDA 2019/2020-EHIS, analyses differences with regard to sex, age and education in terms of health inequalities and classifies the results and developments.

2. Methods

2.1 Study design and sample

German Health Update (GEDA) is a nationwide telephone cross-sectional survey of the resident population in Germany based on a random sample of landline and mobile phone numbers (dual-frame process). The telephone
2.2 Instruments and indicators

Smoking behaviour

To record the smoking status, the participants of GEDA 2019/2020-EHIS were asked the question: ‘Do you smoke any tobacco products, including heated tobacco products? Please exclude electronic cigarettes or similar electronic devices.’ (Response category: ‘Yes, daily’, ‘Yes, occasionally’, ‘No longer’ and ‘I have never smoked’). Based on the response categories, a differentiation will be made below between current smokers (daily or occasionally), former smokers as well as never-smokers.

Passive smoke exposure

The passive smoke exposure was surveyed with the following question: ‘How often are you exposed to tobacco smoke indoors?’ (Response category: ‘Every day, 1 hour or more a day’, ‘Every day, less than 1 hour per day’, ‘At least once a week (but not every day)’, ‘Less than once a week’ and ‘Never or almost never’). The daily passive smoke exposure can be assessed based on the response categories (less than 1 hour or 1 hour or more). This information relates to persons who do not smoke themselves.

2.3 Statistical analyses

To correct deviations of the sample from the population structure, the analyses are performed with a weighting factor. As part of the data weighting, a design weighting is made initially for the different selection probabilities (mobile phone and landline) and an adaptation is made subsequently to the official population figures based on
24.0% of women and 33.9% of men aged 18 years and older smoke at least occasionally.

3. Results

3.1 Smoking behaviour

According to the self-reported information from GEDA 2019/2020-EHIS, 28.9% of adults in Germany smoke at least occasionally, this figure is 24.0% among women and 33.9% among men. More than half of the women (52.4%) states never having smoked. This figure is 36.1% among the men (Table 1). The percentage of the current smokers differs relatively little in the age groups of up to 64 years of age. A significant decline can only be observed starting at the age of 65. If the percentage of smokers in the individual age groups is examined by education, it is larger in the low and in the medium education group than in the high education group, among women as well as among men. People 65 years of age and older, where no education differences exist, form the exception among both sexes.

3.2 Passive smoke exposure

Currently, 4.1% of the non-smoking adult population in Germany is subjected daily to passive smoke exposure (Table 2), together with those who are affected by it at least once per week, this figure is 8.2%. Women are less likely than men to be affected by daily or even weekly passive smoke exposure. The highest exposure is reflected among young adults between the ages of 18 and 29. The passive smoke exposure decreases with increasing age, in particular in the age group of 65 and older.

Among men, the data from the study GEDA 2019/2020-EHIS shows differences in the daily passive smoke exposure, depending on the education level of the respondents: Men from the low and from the medium education group are more frequently affected by a daily passive smoke exposure indoors than those from the high education group.
Table 1
Smoking status by gender, age and education
(n=11,955 women, n=10,682 men)
Source: GEDA 2019/2020-EHIS

<table>
<thead>
<tr>
<th>Smoking status</th>
<th>Total</th>
<th>Women</th>
<th>18–29 years</th>
<th>30–44 years</th>
<th>45–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(95% CI)</td>
<td></td>
<td>(95% CI)</td>
<td>(95% CI)</td>
<td>(95% CI)</td>
<td>(95% CI)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>28.9</td>
<td>(27.9–29.9)</td>
<td>26.7</td>
<td>44.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(25.9–27.5)</td>
<td>(51.1–53.8)</td>
<td>(51.7–62.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>24.0</td>
<td>30.4</td>
<td>(26.4–34.6)</td>
<td>29.1</td>
<td>29.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>47.4</td>
<td>(36.7–58.4)</td>
<td>10.7</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>29.1</td>
<td>(24.2–34.6)</td>
<td>13.6</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.7</td>
<td>(13.3–25.5)</td>
<td>9.6</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td><strong>18–29 years</strong></td>
<td>28.9</td>
<td>30.4</td>
<td>(26.4–34.6)</td>
<td>29.1</td>
<td>29.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>47.4</td>
<td>(36.7–58.4)</td>
<td>10.7</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>29.1</td>
<td>(24.2–34.6)</td>
<td>13.6</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.7</td>
<td>(13.3–25.5)</td>
<td>9.6</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td><strong>30–44 years</strong></td>
<td>28.2</td>
<td>36.6</td>
<td>(29.5–44.3)</td>
<td>28.0</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>29.4</td>
<td>(27.1–31.9)</td>
<td>27.2</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>17.1</td>
<td>(14.2–20.3)</td>
<td>24.4</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td><strong>45–64 years</strong></td>
<td>28.2</td>
<td>36.6</td>
<td>(29.5–44.3)</td>
<td>28.0</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>29.4</td>
<td>(27.1–31.9)</td>
<td>27.2</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>17.1</td>
<td>(14.2–20.3)</td>
<td>24.4</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td><strong>≥65 years</strong></td>
<td>11.3</td>
<td>11.7</td>
<td>(8.5–15.9)</td>
<td>20.4</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.2</td>
<td>(8.7–13.0)</td>
<td>27.4</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.3</td>
<td>(8.7–12.2)</td>
<td>29.0</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>33.9</td>
<td>40.5</td>
<td>(36.7–44.3)</td>
<td>13.1</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>49.7</td>
<td>(41.4–58.1)</td>
<td>9.2</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.4</td>
<td>(35.5–45.6)</td>
<td>13.1</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>26.9</td>
<td>(21.8–32.7)</td>
<td>18.5</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td><strong>18–29 years</strong></td>
<td>33.9</td>
<td>40.5</td>
<td>(36.7–44.3)</td>
<td>13.1</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>49.7</td>
<td>(41.4–58.1)</td>
<td>9.2</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.4</td>
<td>(35.5–45.6)</td>
<td>13.1</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>26.9</td>
<td>(21.8–32.7)</td>
<td>18.5</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td><strong>30–44 years</strong></td>
<td>33.9</td>
<td>45.0</td>
<td>(41.7–48.4)</td>
<td>23.0</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>57.6</td>
<td>(45.0–69.2)</td>
<td>23.3</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>52.3</td>
<td>(47.6–57.0)</td>
<td>21.8</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>28.5</td>
<td>(25.2–32.1)</td>
<td>24.7</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td><strong>45–64 years</strong></td>
<td>33.9</td>
<td>45.0</td>
<td>(41.7–48.4)</td>
<td>23.0</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>57.6</td>
<td>(45.0–69.2)</td>
<td>23.3</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>52.3</td>
<td>(47.6–57.0)</td>
<td>21.8</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>28.5</td>
<td>(25.2–32.1)</td>
<td>24.7</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td><strong>≥65 years</strong></td>
<td>33.9</td>
<td>36.7</td>
<td>(34.4–39.1)</td>
<td>31.2</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>47.6</td>
<td>(37.6–57.9)</td>
<td>24.7</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>42.1</td>
<td>(38.8–45.4)</td>
<td>32.9</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>23.3</td>
<td>(21.3–25.5)</td>
<td>30.7</td>
<td>33.9</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking status</strong></td>
<td></td>
<td>13.6</td>
<td>(11.7–15.8)</td>
<td>47.8</td>
<td>13.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20.8</td>
<td>(12.1–33.4)</td>
<td>40.0</td>
<td>20.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>13.5</td>
<td>(11.0–16.4)</td>
<td>49.8</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.5</td>
<td>(10.0–13.2)</td>
<td>47.4</td>
<td>13.5</td>
<td></td>
</tr>
</tbody>
</table>

CI=confidence interval, *Number of cases is n<20

Adults aged 65 years and over smoke significantly less often than adults in the younger age groups.
8.3% of non-smoking adults are regularly exposed to passive smoke exposure, 4.1% daily.

### Table 2

<table>
<thead>
<tr>
<th>Passive smoke exposure of non-smokers by gender, age and education (n=9,695 women, n=8,083 men)</th>
<th>Daily</th>
<th>At least once a week</th>
<th>Less than once a week</th>
<th>Never or almost never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>4.1 (3.7–4.7)</td>
<td>4.1 (3.6–4.7)</td>
<td>5.8 (5.3–6.3)</td>
<td>85.9 (85.1–86.7)</td>
</tr>
<tr>
<td>Women</td>
<td>3.0 (2.5–3.7)</td>
<td>2.9 (2.4–3.6)</td>
<td>4.7 (4.1–5.3)</td>
<td>89.4 (88.3–90.3)</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29 years</td>
<td>7.2 (4.9–10.6)</td>
<td>9.0 (6.3–12.8)</td>
<td>11.0 (8.6–14.0)</td>
<td>72.7 (68.0–76.9)</td>
</tr>
<tr>
<td>30–44 years</td>
<td>3.2 (2.1–4.8)</td>
<td>2.6 (1.6–4.0)</td>
<td>5.6 (4.2–7.5)</td>
<td>88.7 (86.1–90.8)</td>
</tr>
<tr>
<td>45–64 years</td>
<td>2.7 (2.0–3.7)</td>
<td>2.5 (1.7–3.5)</td>
<td>3.7 (2.9–4.6)</td>
<td>91.1 (89.6–92.5)</td>
</tr>
<tr>
<td>≥65 years</td>
<td>1.5 (1.0–2.2)</td>
<td>1.2 (0.8–1.7)</td>
<td>2.5 (1.9–3.3)</td>
<td>94.8 (93.7–95.7)</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>3.9 (2.4–6.1)</td>
<td>1.7 (0.9–3.2)</td>
<td>3.7 (2.4–5.9)</td>
<td>90.7 (87.7–93.0)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>3.2 (2.5–4.1)</td>
<td>3.9 (3.0–4.9)</td>
<td>4.6 (3.9–5.5)</td>
<td>88.3 (86.8–89.6)</td>
</tr>
<tr>
<td>High education group</td>
<td>1.8 (1.4–2.3)</td>
<td>1.5 (1.1–2.1)</td>
<td>5.7 (4.8–6.9)</td>
<td>90.9 (89.5–92.1)</td>
</tr>
<tr>
<td>Men</td>
<td>5.3 (4.5–6.3)</td>
<td>5.6 (4.8–6.5)</td>
<td>7.2 (6.4–8.0)</td>
<td>81.9 (80.6–83.2)</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29 years</td>
<td>9.1 (6.5–12.5)</td>
<td>10.1 (7.6–13.4)</td>
<td>13.6 (10.9–16.8)</td>
<td>67.2 (62.7–71.4)</td>
</tr>
<tr>
<td>30–44 years</td>
<td>6.5 (4.7–8.9)</td>
<td>8.8 (6.6–11.7)</td>
<td>10.0 (8.0–12.5)</td>
<td>74.7 (71.0–78.0)</td>
</tr>
<tr>
<td>45–64 years</td>
<td>5.8 (4.4–7.6)</td>
<td>4.3 (3.2–5.7)</td>
<td>5.8 (4.7–7.0)</td>
<td>84.1 (81.8–86.2)</td>
</tr>
<tr>
<td>≥65 years</td>
<td>2.1 (1.6–2.9)</td>
<td>2.5 (1.7–3.7)</td>
<td>3.6 (2.8–4.6)</td>
<td>91.8 (90.2–93.1)</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>9.8 (6.3–15.0)</td>
<td>8.6 (5.4–13.4)</td>
<td>5.5 (3.4–9.0)</td>
<td>76.0 (69.7–81.4)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>6.2 (5.1–7.6)</td>
<td>5.9 (4.8–7.3)</td>
<td>7.5 (6.3–8.8)</td>
<td>80.4 (78.3–82.3)</td>
</tr>
<tr>
<td>High education group</td>
<td>2.5 (2.0–3.3)</td>
<td>4.0 (3.3–4.9)</td>
<td>7.4 (6.5–8.4)</td>
<td>86.0 (84.6–87.2)</td>
</tr>
</tbody>
</table>

CI=confidence interval, *Number of cases is n<20

4. Discussion

According to the data from GEDA 2019/2020-EHIS, 28.9% of adults, proportionately more men than women, currently still smoke (daily or occasionally) in Germany. It is only in the group aged 65 and older that the proportion of smokers and the educational differences decrease.

8.2% of the non-smoking adults are frequently subjected to passive smoke exposure. A significant sex difference can also be observed here to the effect that men are affected more frequently. A frequent passive smoke exposure is reported in particular by women and men between the ages of 18 and 29, and even further by men up to the age of 44. Among men, there are also strong differences in education to the disadvantage of the low education group.

With regard to their size, the present results relating to the smoking behaviour fall within the results of other nationwide representative surveys and studies. It is important to take into consideration that the surveys are partly older, partly refer to different age ranges and that different...
Young adults are most frequently affected by passive smoke exposure.

survey methodologies (survey by telephone, paper questionnaire or online) or survey tools were used, respectively, which limits a direct comparison. According to the data from the socioeconomic panel (SOEP) with the question ‘Do you currently smoke, either cigarettes, pipes or cigars?’ (Response options: No, Yes), the percentage of smokers in 2016 among persons from 18 years of age is 22.4% for women, 29.5% for men [24]. According to the sample census 2017 (question: ‘Do you currently smoke?’ (Response options: Yes, regularly, yes, occasionally, no), 19% of the women from 15 years of age and older and 26% of the men of the same age smoke [25]. According to data from the epidemiological surveys on addiction 2018, which relate to the population between the ages of 18 and 24, 20.0% of women and 26.4% of men indicate having smoked a cigarette, cigar, cigarillo or pipe within the last 30 days prior to the survey [26], and in the current survey of the German Study on Tobacco Use (DEBRA) in 2020/2021, which includes persons from the age of 14, 26.0% of women and 34.0% of men smoke [27]. The question was: ‘Which of the following statuses best describes you? Please note that this refers to smoking tobacco and not electronic cigarettes or tobacco heaters.’ Response options: I smoke cigarettes, namely daily., I smoke cigarettes, but not daily., I do not smoke cigarettes at all, but I smoke tobacco in another form (for example pipe or cigar)., I have stopped smoking completely in the last 6 months., I have stopped smoking completely more than 6 months ago., I never smoked (never longer than one year).

The passive smoke exposure in the last seven days of persons from the age of 14 in vehicles, indoors and outdoors was surveyed in two waves of the DEBRA study (between January and March of 2020) [28]. According to this, 25% of respondents indicate an exposure indoors in the last seven days. 11.4% indicated an exposure on one to two days in the last seven days. Among non-smokers, this percentage was 9.2%, among former smokers it was 11.1%. Due to the different question, the results can only be partially compared with those of GEDA 2019/2020-EHIS. However, they lie within a similar range.

The result of GEDA 2019/2020-EHIS, according to which more men than women smoke, can also be observed in the already mentioned studies. This sex difference has partly historical reasons because smoking in Germany among women was less socially acceptable than among men until the 1960s, and only a small percentage of women started smoking [29]. This is also confirmed by analyses relating to trends and developments in the tobacco consumption of adults in Germany, which show a continuous increase of the prevalence of ever having smoked among women born between 1930 and 1959, while the percentage among men has hardly changed in this time period [30]. The analysis was therefore also able to show that the sex difference reduced over time [30]. This is attributed to a sharper decline of the smoking prevalence among men compared to women from 2003 onward. The percentage of people who have never smoked since the 1970s can be illustrated using the data from the Drug Affinity Study conducted by the Federal Centre for Health Education, and can thus show, how accepted and widespread smoking is among adolescents and young adults and whether sex differences exist or the development thereof, respectively. The percentage of never-smokers increases continuously among adolescents between the ages of 12 and 17,
and, with 85.1% in 2019, is as high as never before, whereby there are hardly any sex differences any longer [31]. Among young adults between the ages of 18 and 25, an increase of the percentage of never-smokers can also be observed, it is currently 45.9%. However, there are differences by sex (women: 50.5%, men: 41.9%) in these age groups. They can in particular be attributed to differences among the 22- to 25-year olds [31]. These results can be considered to be an indication that the sex differences will equalise further in the future when birth cohorts that started smoking at a lower percentage, become middle-aged and of more advanced age.

There is also a gender difference in passive smoke exposure in that men are more often affected. The earlier GEDA studies already showed differences in the passive smoke exposure to the disadvantage of men [32, 33]. The DEBRA study finds sex differences for the passive smoke exposure in vehicles, but not indoors or outdoors [28]. According to this, the probability is lower among women that they were exposed to passive smoking in a vehicle in the last seven days.

The fact that the percentage of smokers decreases only with increasing age (from 65 years of age) is also substantiated in the other studies relating to the smoking behaviour in Germany [24, 25]. The reason for the decline could be cohort effects because the smoking behaviour of previous birth cohorts differs from that of subsequent birth cohorts [29, 30]. A further reason could be the diseases and symptoms that occur more frequently in the higher age groups, which is why smoking is given up. The increased premature mortality of smokers can also contribute to the percentage of smokers being lower among older population groups [34–36]. The age differences in the passive smoke exposure, according to which in particular young adults are affected, are also shown in other studies [28, 32, 37].

A higher tobacco consumption in low education groups in Germany has been noticeable for many years [38–40]. The present results from GEDA 2019/2020-EHIS confirm this. The development over time makes it clear that the differences in the smoking behaviour have increased starting in the early 2000s to the effect that there has been a significant decline in the percentage of smokers among women and men of the high education group, whereas the percentage remained approximately the same among men in the low education group, and even increased among women [38, 40]. Educational differences in the smoking behaviour already become apparent during adolescence [30, 41], a formative period in the decision for or against smoking. This behaviour manifests itself in young adulthood. According to this, the higher smoking prevalence in the low education groups is characterised by a more frequent smoking initiation and rarer cessation [42].

In the case of the passive smoke exposure, educational differences also become apparent to the disadvantage of the low education group, in particular among men between the ages of 30 and 64. In GEDA 2014/2015-EHIS, where in addition to the extent, the location of the passive smoke exposure was also surveyed, analyses showed that the higher passive smoke exposure in the low and medium education group among men who do not smoke could mainly be traced back to a high exposure to passive smoke in the workplace [32]. This is consistent with results, according to which the percentage of smokers is still highest
Earlier trend evaluations from other surveys can thus be used to assess the development in the smoking behaviour of adults. For the time period between 2003 and 2015, they substantiate a decreasing percentage of smokers [30]. Other surveys, such as the sample census 2017 [25] and the epidemiological survey on addiction 2018 [45] had most recently reported decreasing percentages of smokers among the adult population. The DEBRA study recorded a slight increase of the percentage of smokers for the first time again between 2020 and 2021 [27]. A changed smoking behaviour as a result of the COVID-19 pandemic is discussed as one reason [46, 47]. The results from the COSMO study (COVID-19 snapshot monitoring), which also analyses, among other things, the behaviour of the population during the Corona pandemic, suggest that the spread and the frequency of the consumption of tobacco and electronic cigarettes has increased during the pandemic (between April of 2020 and September of 2021) [48]. The design of the current GEDA study allows the assessment of the monthly progression of the smoking behaviour during the entire study period (04/2019 to 09/2020). The analyses do not reveal any noticeable developments in the smoking behaviour during the pandemic [49, 50].

The smoking behaviour of the adult population is captured routinely in health surveys conducted by the Robert Koch Institute, most recently in GEDA 2014/2015-EHIS [44]. When comparing the results, it appears that there is an increase of the percentage of smokers in the adult population in GEDA 2019/2020 (23.8% v. 28.9%). However, the results of these two survey points can only be compared to a limited extent because different survey modes were used (online questionnaire v. telephone interview) and the questions for capturing the smoking behaviour were changed in the EHIS (while the response categories remained the same). GEDA 2019/2020-EHIS explicitly captures the smoking of tobacco products including tobacco heaters, while GEDA 2014/2015-EHIS asked ‘Do you smoke’. The samples of both surveys also differ: GEDA 2014/2015-EHIS is based on a registration office sample, and GEDA 2019/2020-EHIS is based on a telephone sample.

in professions with a low professional status [43], even though the Workplace Ordinance has been regulating non-smokers protection for employees since 2002. According to this, employers are legally obligated to protect non-smoking employees from the health risks caused by passive smoking. The exact structure, however, is not regulated in the ordinance, but is up to the employers. It can currently not be assessed whether men from low education groups are still affected more frequently by passive smoke in the workplace. The DEBRA study also finds educational differences with regard to the passive smoke exposure in vehicles and indoors to the effect that people with low education had a higher risk of being exposed to passive smoke than persons with high education [28].

The smoking behaviour of the adult population is captured routinely in health surveys conducted by the Robert Koch Institute, most recently in GEDA 2014/2015-EHIS [44]. When comparing the results, it appears that there is an increase of the percentage of smokers in the adult population in GEDA 2019/2020 (23.8% v. 28.9%). However, the results of these two survey points can only be compared to a limited extent because different survey modes were used (online questionnaire v. telephone interview) and the questions for capturing the smoking behaviour were changed in the EHIS (while the response categories remained the same). GEDA 2019/2020-EHIS explicitly captures the smoking of tobacco products including tobacco heaters, while GEDA 2014/2015-EHIS asked ‘Do you smoke’. The samples of both surveys also differ: GEDA 2014/2015-EHIS is based on a registration office sample, and GEDA 2019/2020-EHIS is based on a telephone sample.
The passive smoke exposure was also captured in earlier health surveys conducted by the Robert Koch Institute, most recently in GEDA 2014/2015-EHIS [32]. At that time, 11.3% of the non-smokers reported passive smoke exposure indoors for less than one hour or one hour per day or more [32]. These results, however, can also be compared only to a limited extent because the specifications for the response categories in both EHIS waves were changed, while the questions remained the same. Five response categories (see above) were available in GEDA 2019/2020-EHIS, three were available in GEDA 2014/2015-EHIS (‘Never or almost never, ‘Less than 1 hour per day’, ‘1 hour or more a day’). Even if the change of the response categories limits the comparability, the low prevalence of the daily passive smoke exposure in GEDA 2019/2020-EHIS (4.1%) suggests that this affects fewer people than just five years ago. The fact that the question about the passive smoke exposure does not specify a frame of reference, for example in the last month, is restrictive. It is thus rather an approximate estimation than an exact representation of the exposure.

To reduce the tobacco consumption among the public and to better protect non-smokers against the health risks of passive smoking, tobacco control policy measures have been introduced in Germany since the early 2000s to an increased extent. This includes multi-level tobacco duty increases, the revision of the Workplace Ordinance with the regulation of the protection of the non-smoking employees while working, the increase of the age limit for purchasing and consuming tobacco products from 16 to 18, the federal and state non-smoker protection acts, and the tightening of the legal regulations for tobacco advertisement [51]. In addition, target group- and setting-related programs and campaigns were started. Significant impulses for this development originated from the Framework Convention on Tobacco Control (FCTC), the stated aim of which is the protection against health-related, social, ecological and economic consequences of tobacco consumption and of passive smoking. The Convention is a treaty under international law that was adopted by the 56th World Health Assembly and entered into force on February 27, 2005. Germany signed the treaty in 2004, thereby committing itself to ratification.

By international standards, the measures to control tobacco implemented in Germany by 2019 were still relatively weak. This assessment was also reflected in the European tobacco control scale of 2019, for which a total of 36 countries were compared with regard to their efforts to effectively prevent and control tobacco. Germany was in last place in this ranking [52]. Since 2019, there have been further legal measures, such as those to limit tobacco advertisement in movie theatres and to gradually introduce the ban on outdoor advertising based on the changes to the Tobacco Products Act of 2020, and a change to the Tobacco Duty Law and the Tobacco Duty Ordinance based on the Tobacco Duty Modernisation Act of 2021, which regulates a taxation of cigarettes and fine cut in the next five years, as well as the adaptation of the taxation of heated tobacco and substances consumed in electronic cigarettes, including water pipe tobacco. The ‘Strategy for a tobacco-free Germany 2040’ was likewise published in 2021 by a broad alliance of health and civic organisations [17]. The goal is that in 2040, less than five percent of adults and less than two percent of adolescents in Germany consume...
tobacco products, electronic cigarettes or other related products, in particular if they contain the addictive nicotine. The strategy names ten measures with concrete partial steps and time targets for the implementation thereof, which are based on the FCTC. In detail, they are the following measures: Tobacco duty increase, support for smokers when quitting smoking, advertising ban and standardised packaging, reduction of the availability of tobacco and related products, protection against passive smoke exposure, implementation of the children’s rights and protection of minors with regard to tobacco, educational campaigns, initiatives for the control of tobacco and alternatives for tobacco growing as part of the development cooperation, protecting political decisions and the organisations thereof against being influenced by the tobacco industry as well as frequent review, adaptation and further development of the mentioned measures. From a public health perspective, the health policy-related implementation of these measures would be an important contribution in order to further decrease the most significant avoidable health risk in Germany and to take thereby also into greater account the concerns of socially disadvantaged groups.

Please cite this publication as
Smoking behaviour and passive smoke exposure of adults – Results from GEDA 2019/2020-EHIS.
DOI 10.25646/10291

Data protection and ethics
GEDA 2019/2020 is subject to strict compliance with the data protection provisions set out in the EU General Data Protection Regulation (GDPR) and the Federal Data Protection Act (BDSG). The Ethics Committee of the Charité – Universitätsmedizin Berlin assessed the ethics of the study and approved the implementation of the study (application number EA2/070/19).

Participation in the study was voluntary. The participants were informed about the aims and contents of the study and about data protection. Informed consent was obtained verbally.

Availability of data
The authors confirm that some access restrictions apply to the data underlying the findings. The data set cannot be made publicly available because informed consent from study participants did not cover public deposition of data. However, the minimal data set underlying the findings is archived in the Research Data Centre at the Robert Koch Institute and can be accessed by researchers on reasonable request. On-site access to the data set is possible at the Secure Data Center of the Robert Koch Institute’s

The German version of the article is available at:
www.rki.de/journalhealthmonitoring

Corresponding author
Anne Starker
Robert Koch Institute
Department of Epidemiology and Health Monitoring
General-Pape-Str. 62–66
12101 Berlin, Germany
E-mail: StarkerA@rki.de
Smoking behaviour and passive smoke exposure of adults – Results from GEDA 2019/2020-EHIS

Research Data Centre. Requests should be submitted by e-mail to fdz@rki.de.

Funding
GEDA 2019/2020-EHIS was funded by the Robert Koch Institute and the German Federal Ministry of Health.

Conflicts of interest
The authors declared no conflicts of interest.

Acknowledgement
Special thanks are due to all those involved who made the GEDA study possible through their committed cooperation: the interviewers from USUMA GmbH, the colleagues of the GEDA team at the RKI. We would also like to thank all participants.

Note
The dashboard ‘German Health Update – GEDA 2019/2020’ features more than 40 health indicators in the areas of health behaviour, health care, health status, physical and mental health. These can be selected according to gender, age, education and federal state. The health indicator smoking, for example, can be found under the category health behaviour. The dashboard is only available in German. Further information: www.rki.de/geda-dashboard

References


22. Forschungsdatenzentren der Statistischen Ämter des Bundes und der Länder (2017) Mikrozensus 2017. DOI: 10.21242/12211.2 017.00.00.1.1.1, own calculation


Overweight and obesity among adults in Germany – Results from GEDA 2019/2020-EHIS

Abstract
Background: Overweight and obesity and their associated secondary diseases are of high public health relevance.

Methods: Self-reported body weight and body height data are available in the study German Health Update (GEDA 2019/2020-EHIS). The body mass index (BMI, kg/m²) was calculated and overweight (including obesity, BMI ≥25 kg/m²) and obesity (BMI ≥30 kg/m²) were derived.

Results: According to this self-report, 53.5% of adults in Germany are overweight, men more often than women. The obesity prevalence for both sexes is 19.0%. The prevalence of overweight and obesity increases with age in both women and men. Obesity is significantly more prevalent in low education groups compared to high education groups. Compared to GEDA 2012, the prevalence of overweight is unchanged, but the obesity prevalence has continued to increase, particularly among 45- to 64-year-olds.

Conclusion: The prevention potential of avoiding overweight and obesity remains high.

Introduction
Overweight is a body weight which exceeds the normal body weight for a given body height. Severe overweight is also known as obesity and is classified as a disease by the World Health Organization (WHO) [1]. Obesity is a risk factor for many secondary diseases such as type 2 diabetes, cardiovascular diseases, several types of cancer, musculoskeletal disorders and is associated with a higher risk of premature death [2, 3]. The risk of other diseases increases with increasing severity of obesity. Obesity and its secondary diseases are a significant public health problem, both nationally and internationally, and a major challenge for the health care system: OECD countries spend approximately 8.4% of their health care expenditures on the treatment of obesity-related diseases [4]. Worldwide, the proportion of people with obesity has tripled since 1975 [5], and in Germany the prevalence has also been increasing continuously since 1990 [6, 7]. The extent to which this increase in the prevalence of overweight and obesity in the population will continue – also against the background of the COVID-19 pandemic – can be assessed using current interview data from the GEDA 2019/2020-EHIS study. This article presents current overweight and obesity prevalence by sex, age, and education groups.
**GEDA 2019/2020-EHIS**

Fifth follow-up survey of the German Health Update

**Data holder:** Robert Koch Institute

**Objectives:** Provision of reliable information on the health status, health behaviour and health care of the population living in Germany, with the possibility of European comparisons

**Study design:** Cross-sectional telephone survey

**Population:** German-speaking population aged 15 and older living in private households that can be reached via landline or mobile phone

**Sampling:** Random sample of landline and mobile telephone numbers (dual-frame method) from the ADM sampling system (Arbeitskreis Deutscher Markt- und Sozialforschungsinstitute e.V.)

**Sample size:** 23,001 respondents

**Study period:** April 2019 to September 2020

**GEDA survey waves:**
- GEDA 2009
- GEDA 2010
- GEDA 2012
- GEDA 2014/2015-EHIS
- GEDA 2019/2020-EHIS

Further information in German is available at www.geda-studie.de

---

**Indicator**

The German Health Update (GEDA) is a nationwide cross-sectional survey of the resident population living in Germany. The fifth follow-up survey, GEDA 2019/2020-EHIS, took place between April 2019 and September 2020. In GEDA 2019/2020-EHIS, 23,001 participants aged 15 years and older were interviewed about their health status, health care, health behaviour, and their demographic and socio-economic background. Interview duration was approximately 40 minutes. The response rate was 21.6%. A detailed description of the GEDA 2019/2020-EHIS methodology can be found in the article *German Health Update (GEDA 2019/2020-EHIS) – Background and methodology* in issue 3/2021 of the Journal of Health Monitoring [8].

In GEDA 2019/2020-EHIS, body height and body weight were asked in a telephone interview using a programmed, fully structured questionnaire (Computer Assisted Telephone Interview, CATI). The question on body height was: ‘How tall are you when you are not wearing shoes?’ The information was given in cm. The body weight question was: ‘How much do you weigh when you are not wearing clothes and shoes? Please indicate your body weight in kg. Pregnant women, please indicate your weight before pregnancy.’

In GEDA 2019/2020-EHIS, the data on body weight and body height are self-reported, and in this situation body weight is often underestimated compared to standardised measured values, while body height tends to be overestimated. As a result, the body mass index (BMI; see Info box) calculated using self-reported data is lower than a BMI calculated using measured body weight data [9], so that overweight and obesity prevalence from the GEDA time series is lower than those from measured data from examination surveys. Therefore, the current prevalence of overweight (including obesity) and obesity may be underestimated.

Gender identity was used in GEDA 2019/2020-EHIS to describe gender differences [10]. Participants were able to indicate which sex they felt they belonged to. Among participants 18 years and older, 11,959 indicated a female identity and 10,687 indicated a male identity. 62 participants indicated a different gender identity or did not provide any information. In the analyses stratified by sex, individuals with a different gender identity or no indication are not considered. The present analyses are based on data from 22,414 participating individuals aged 18 years and older with valid information on body weight and height; 11,736 women and 10,618 men are used for analyses by sex, age, and education groups.

To correct for deviations of the sample from the population structure, the analyses were performed applying a weighting factor. First, a design weighting was performed for the different selection probabilities (mobile and fixed network) and then an adjustment was made to the official population figures in terms of age, sex, federal state and district type (as of: 31/12/2019). In addition, the distribution of education was adjusted to the distribution in the German Microcensus (2017) according to the International Standard Classification of Education (ISCED classification) [11].

In this article, prevalence with 95% confidence intervals (95% CI) for underweight, normal weight, overweight without obesity, obesity and overweight (including obesity) are reported in tabular form. Due to space limitations, in the text, only obesity and overweight (including obesity) are described by sex, age and education groups. When com-
Overweight and obesity among adults in Germany – Results from GEDA 2019/2020-EHIS

Compared to GEDA 2012, there is no significant change. In contrast, obesity prevalence has continued to increase since GEDA 2012 for both women (+2.5 percentage points) and men (+2.1 percentage points). Accordingly, currently nearly 13 million adults in Germany are obese.

Prevalence rates of overweight (including obesity) and obesity are similar as observed in official statistics, for which data is also based on self-reports by participants. According to the German Microcensus (2017), 52.7% of adults were overweight (including obese), and 16.3% were obese [13]. Compared to the first survey in 1999, there was an increase of 3.5 percentage points for women and 6 percentage points for men. Thus, the GEDA 2019/2020-EHIS results confirm the upward trends in obesity prevalence observed with other population-based data.

According to GEDA 2019/2020-EHIS, 13.2% (12.5%–13.9%) of adults have obesity Class 1, 4.0% (3.6%–4.5%) have obesity Class 2, and 1.8% (1.5%–2.2%) have obesity Class 3 (for definitions see Info box). Compared to GEDA 2012, there has been an increase of 1.1 percentage points for Class 1, 0.7 percentage points for Class 2, and 0.5 percentage points for Class 3. Nationwide ambulatory claims data also show that the prevalence of diagnosed obesity increased significantly between 2009 and 2018: from 3.5% to 13.6% for Class 1, from 1.7% to 11.7% for Class 2, and from 1.1% to 7.1% for Class 3 [14]. However, the significant prevalence increase in ambulatory claims data between 2009 and 2018 is also due to coding: the proportion of non-specific coded obesity diagnoses decreased over time, and coding is increasingly differentiated by obesity categories (Class 1–3).

This is another reason why the further spread of obesity of all class levels can be observed over the past decade.

Results and classification

In Germany, 53.5% of the population (46.6% of women and 60.5% of men) is overweight (including obesity). Obesity is present in 19.0% of adults. While significantly more men than women are overweight (including obese), there is no difference in obesity prevalence between the sexes (Table 1).

It can be seen that the age-standardised prevalence of overweight (including obesity) has remained high in recent years. In 2012 it was 53.0% (women 46.3%, men 59.7%). Compared to GEDA 2012, there is no significant change. In contrast, obesity prevalence has continued to increase since GEDA 2012 for both women (+2.5 percentage points) and men (+2.1 percentage points). Accordingly, currently nearly 13 million adults in Germany are obese.

Prevalence rates of overweight (including obesity) and obesity are similar as observed in official statistics, for which data is also based on self-reports by participants. According to the German Microcensus (2017), 52.7% of adults were overweight (including obese), and 16.3% were obese [13]. Compared to the first survey in 1999, there was an increase of 3.5 percentage points for women and 6 percentage points for men. Thus, the GEDA 2019/2020-EHIS results confirm the upward trends in obesity prevalence observed with other population-based data.

According to GEDA 2019/2020-EHIS, 13.2% (12.5%–13.9%) of adults have obesity Class 1, 4.0% (3.6%–4.5%) have obesity Class 2, and 1.8% (1.5%–2.2%) have obesity Class 3 (for definitions see Info box). Compared to GEDA 2012, there has been an increase of 1.1 percentage points for Class 1, 0.7 percentage points for Class 2, and 0.5 percentage points for Class 3. Nationwide ambulatory claims data also show that the prevalence of diagnosed obesity increased significantly between 2009 and 2018: from 3.5% to 13.6% for Class 1, from 1.7% to 11.7% for Class 2, and from 1.1% to 7.1% for Class 3 [14]. However, the significant prevalence increase in ambulatory claims data between 2009 and 2018 is also due to coding: the proportion of non-specific coded obesity diagnoses decreased over time, and coding is increasingly differentiated by obesity categories (Class 1–3).

This is another reason why the further spread of obesity of all class levels can be observed over the past decade.

Info box

Body Mass Index (BMI)

To calculate the BMI, the body weight of a person (in kilograms) is divided by the square of the body height (measured in meters). BMI categories are defined according to World Health Organization (WHO) classification [1] as follows:

- Underweight: BMI<18.5 kg/m²
- Normalweight: 18.5–<25 kg/m²
- Overweight (including obesity): BMI≥25.0 kg/m²
- Obesity: BMI≥30.0 kg/m²
- Obesity Class 1: BMI 30–<35 kg/m²
- Obesity Class 2: BMI 35–<40 kg/m²
- Obesity Class 3: BMI≥40.0 kg/m².
According to self-reported data, 46.6% of women and 60.5% of men in Germany are overweight (including obesity), and 19.0% of adults are affected by obesity.

With increasing age, the prevalence of overweight (including obesity) and obesity increases in both women and men.

The prevalence of overweight (including obesity) increases with age, and the proportion of women and men affected by obesity also increases steadily over the life course. While only about 10% of women and men in the 18- to 29-year-old age group are affected by obesity, this proportion rises to more than 20% among 45- to 64-year-olds. These age- and gender-specific trends are also consistent with results from earlier surveys conducted by the Robert Koch Institute [7]. A statistically significant increase in obesity prevalence has been observed since GEDA 2012, particularly among young women in the 18- to 29-year-old age group (from 5.7% to 10.0%) and in the 45- to 64-year-old age group: from 19.3% to 22.9% among women and from 20.4% to 23.8% among men. Since GEDA 2012, the prevalence of obesity in the age group 65 years and older is unchanged. While in recent years there has been an increase primarily in young adulthood, there is now also an increase in the middle age group.

Obesity is significantly more common in the low education group compared to the high education group, a fact that has already been described in previous population-based surveys internationally [15, 16] and also for Germany [17]: More than twice as many women and men in the low education group compared to the high education group are affected by obesity, with the exception of men in the age group 65 years and older. Also, for the indicator overweight (including obesity), there is a 1.5 times higher prevalence among women in the low education group compared to women in the high education group, again with the exception of those 65 years and older. Among men, these differences are observed only among those aged 45 to 64 years. The extent to which these differences have changed since GEDA 2012 will be revealed by further analysis of the GEDA data. However, results from the period 1990 to 2011 indicate an increase in health inequalities due to the differential increase in obesity prevalence across socioeconomic status groups [17].

Thus, it can be stated that the goal of the German Sustainable Development Strategy from 2016 [18], to prevent the proportion of the adult population with obesity from increasing further, has not yet been achieved. Comparison of GEDA 2012 and GEDA 2019/2020-EHIS shows a further increase. Whether and how substantial the months with strict containment measures due to the COVID-19 pandemic had an impact on the prevalence of overweight and obesity, cannot be determined from these survey data. Initial analysis from GEDA 2019/2020-EHIS on body weight and BMI show that there was an increase in body weight and BMI between April to August 2020 compared to April to August 2019 [19], but this increase did not continue between October 2020 and January 2021. Nevertheless, compared with the pre-pandemic period, mean BMI increased by 0.3 units and body weight increased by 0.8 kg [20]. This weight gain appears small at first, but it is substantially higher than the average mean weight gain per year for the 45- to 64-year-old cohort participants: It is only 250 g for men and 240 g for women [21].

Future structured treatment programs for those affected by obesity (so-called Disease Management Programmes, DMPs) should help to improve obesity treatment. A DMP for obesity is currently being developed. The huge prevention potential of overweight and obesity should be emphasised and prevention measures aimed at changing individual health behaviour as well as setting based measures to reduce social health inequalities should be addressed.
Table 1

<table>
<thead>
<tr>
<th>Education Group</th>
<th>BMI &lt;18.5 kg/m²</th>
<th>18.5–25.0 kg/m²</th>
<th>Overweight (without obesity)</th>
<th>Obesity</th>
<th>Overweight (including obesity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women 18–29 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30–44 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45–64 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥65 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High education group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BMI=Body Mass Index, CI=confidence interval

**Overweight and obesity among adults in Germany – Results from GEDA 2019/2020-EHIS**

Obesity is significantly more prevalent in low education groups compared with high education groups.

Compared to GEDA 2012, obesity prevalence has further increased.

A significant increase is particularly evident among adults aged 45 to 64.
However, the minimal data set underlying the findings is archived in the Research Data Centre at the Robert Koch Institute and can be accessed by researchers on reasonable request. On-site access to the data set is possible at the Secure Data Center of the Robert Koch Institute’s Research Data Centre. Requests should be submitted by e-mail to fdz@rki.de.

Funding
GEDA 2019/2020-EHIS was funded by the Robert Koch Institute and the German Federal Ministry of Health.

Conflicts of interest
The authors declared no conflicts of interest.

Note
The dashboard ‘German Health Update – GEDA 2019/2020’ features more than 40 health indicators in the areas of health behaviour, health care, health status, physical and mental health. These can be selected according to gender, age, education and federal state. The health indicator body weight, for example, can be found under the category health behaviour. The dashboard is only available in German. Further information: www.rki.de/geda-dashboard

Availability of data
The authors confirm that some access restrictions apply to the data underlying the findings. The data set cannot be made publicly available because informed consent from study participants did not cover public deposition of data.
Overweight and obesity among adults in Germany – Results from GEDA 2019/2020-EHIS

References
11. Forschungsdatenzentren der Statistischen Ämter des Bundes und der Länder (2017) Mikrozensus 2017. DOI: 10.21242/12211.2 017.00.0.11.1, own calculations
Overweight and obesity among adults in Germany – Results from GEDA 2019/2020-EHIS

Imprint
Journal of Health Monitoring
www.rki.de/journalhealthmonitoring-en

Publisher
Robert Koch Institute
Nordufer 20
13353 Berlin, Germany

Editorial Office
Department of Epidemiology and Health Monitoring
Unit: Health Reporting
General-Pape-Str. 62–66
12101 Berlin, Germany
Phone: +49 (0)30-18 754-3400
E-mail: healthmonitoring@rki.de

Editor-in-Chief
Dr Thomas Ziese,
Deputy: Dr Anke-Christine Saß

Editors
Dr Martina Groth, Johanna Gutsche, Dr Birte Hintzpeter,
Dr Franziska Prütz, Dr Alexander Rommel, Dr Livia Ryl,
Dr Anke-Christine Saß, Stefanie Seeling, Simone Stimm

Typesetting
Katharina Behrendt, Alexander Krönke, Kerstin Möllerke

Translation
intellitext SprachenService

ISSN 2511-2708

Note
External contributions do not necessarily reflect the opinions of the Robert Koch Institute.

The Robert Koch Institute is a Federal Institute within the portfolio of the German Federal Ministry of Health
How much do adults sit? Results from the German Health Update (GEDA 2019/2020-EHIS)

Abstract

**Background:** Sedentary behaviour is increasingly perceived as a risk factor for the development of diseases and for increased mortality. In particular, increased time spent sitting in combination with low physical activity seems to have negative health consequences.

**Methods:** In the nationwide cross-sectional study German Health Update (GEDA 2019/2020-EHIS), the indicator ‘sitting’ was captured by the self-report of the participants.

**Results:** For at least eight hours a day, 16.7% of women and 22.3% of men sit: Men more often than women, younger persons more often than older persons and the proportion increases significantly from the low to the high education group. Similarly, about one fifth of adults in Germany sit for at least four hours a day and do not engage in physical activity in their leisure time.

**Conclusion:** The results indicate that preventive measures are needed to reduce time spent sitting and increase physical activity.

SITTING · PHYSICAL INACTIVITY · ADULTS · HEALTH MONITORING

Introduction

In recent years, sitting as a risk factor for the development of diseases has increasingly come into scientific and media focus. In this context, the term ‘sitting’ refers to activities performed while sitting or lying down when awake, which are associated with low energy consumption [1]. If the metabolic equivalent (MET) is used to compare energy consumption in different activities, the value for sitting behaviour is <1.5 MET (for classification: 1 MET corresponds to the energy consumption while resting and 7 METs correspond on average to the energy consumption while jogging) [2]. The negative health consequences of physical inactivity, which describes insufficient physical activity in terms of not reaching physical activity recommendations, have been known for some time [3]. Studies on the negative health effects of sitting, on the other hand, are a relatively new area of research. However, it is already clear that long periods of time spent sitting are associated with an increased likelihood of frailty and physical impairments, as well as depression and are also linked to low health-related quality of life and cognitive performance [4]. The risk of health hazards seems to increase with longer time spent sitting. In addition, it appears that the negative health effects of sitting can be at least partially...
compensated for by increased physical activity [5, 6]. For example, in a meta-analysis, persons who sat at least eight hours a day were 32% more likely to die from cardiovascular disease than persons who sat less than four hours a day [6]. However, this association could only be demonstrated for persons with low physical activity, while persons with high physical activity (at least 60 minutes of moderate to vigorous activity per day), which is well above current physical activity recommendations and a high amount of sitting time did not show increased mortality. Currently, there is not enough data to make specific recommendations on maximum time spent sitting per day, nor to describe the amount of physical activity needed to possibly mitigate negative health effects [3]. What is clear, however, is that increased time spent sitting in combination with very low physical activity in particular have negative health consequences. In a review article, for example, the risk of premature death is described as moderate to high, if persons sit for at least four hours a day and at the same time moderate to vigorous physical activity is less than five minutes a day [7].

The German Health Update (GEDA) is a nationwide cross-sectional survey of the resident population living in Germany. The fifth follow-up survey, GEDA 2019/2020-EHIS, took place between April 2019 and September 2020. The indicator ‘sitting’ was captured in GEDA 2019/2020-EHIS by self-reporting by participants in a telephone survey using a fully structured questionnaire (Computer Assisted Telephone Interview, CATI). The question was taken from the Global Physical Activity Questionnaire (GPAQ) and read: ‘How much time do you spend sitting or resting in an ordinary day?’ [8]. The introduction pointed out that sitting or resting at work, at home, during transport or with friends should be considered and examples were given (sitting at a desk, sitting with friends, driving a car, bus or train, reading or watching TV). Time spent sleeping should be excluded. The response categories were: Less than four hours per day/four hours to less than six hours per day/six hours to less than eight hours per day/eight hours to less than ten hours per day/ten hours to less than twelve hours per day/twelve hours per day and more. For the analysis, a variable with four categories was formed, for which the high three response categories were combined into ‘At least eight hours per day’.

The indicator ‘sitting’ is presented stratified by gender, age and educational status (International Standard Classification of Education, ISCED [9]).

In addition, based on Dunstan et al. [7], an indicator was formed that shows persons who sit for at least four hours a day and do not engage in any moderate to vigorous physical activity in their leisure time (this can be sport, fitness or other physical activities). A more detailed description of the indicator of leisure time physical activity can be found in the GEDA Dashboard [10].

The analyses are based on data from 22,560 participants aged 18 years and older (11,863 women, 10,638 men, 59 persons with a different or no gender identity [11]) with valid information on sitting. The data of 11,775 women and 10,561 men were included for the analyses on sitting and physical activity during leisure time.

To correct for deviations of the sample from the population structure, the analyses were performed applying a
How much do adults sit? Results from the German Health Update (GEDA 2019/2020-EHIS)

> Men sit at least eight hours a day more often than women (22.3% vs. 16.7%).

weighting factor. As part of the data weighting, a design weighting was first performed for the different selection probabilities (mobile and landline network). This was followed by an adjustment to the official population figures based on age, sex, federal state, and district type (as of 31 December 2019). In addition, it is adjusted to the education distribution in the Microcensus 2017 according to the International Standard Classification of Education (ISCED classification) [12].

In this article, prevalences are reported with 95% confidence intervals (95% CI). A significant difference is assumed if the p-value calculated, taking into account the weighting and the survey design, is smaller than 0.05.

A detailed description of the GEDA 2019/2020-EHIS methodology can be found in the article German Health Update (GEDA 2019/2020-EHIS) – Background and methodology in issue 3/2021 of the Journal of Health Monitoring [13].

**Results and discussion**

33.1% of women and 27.5% of men sit for less than four hours a day. Particularly high times spent sitting of at least eight hours a day were reported by 16.7% of women and 22.3% of men (Table 1). This means that men achieve this high level of time spent sitting more often than women. The higher the age, the less often women and men sit for at least eight hours a day, a clear difference can be seen between the age groups 18 to 64 years and 65 years and older. For example, while 25.4% of 18- to 29-year-old women sit for at least eight hours a day, the proportion is 7.5% for the over 65 age group (Table 1). In addition, women aged 30 to 44 years are more likely to sit less often (less than four hours a day) than women in other age groups. For men, there is no clear age effect in the group of those who sit the least.

From the low to the high education group, the proportion of adults who sit at least eight hours a day increases significantly. In particular, among 18- to 29-year-old women and men in the high education group, the proportion with a sitting time of at least 8 hours a day is high at 35.4% and 39.8% respectively (Table 1). If the differences in sitting between the education groups are stratified by age, it becomes clear that these differences do not exist among women aged 65 and older.

The proportion of persons who sit for at least four hours a day and do not engage in physical activity in the leisure time is 22.6% for women and 24.3% for men (Figure 1). With increasing age, this proportion increases for both women and men. In the over 65 age group, about one-third sit for at least four hours a day and are not physically active in their leisure time.

About one fifth of adults achieve high times spent sitting, which, assuming eight hours of sleep, account for at least half of the waking time. According to current studies, this group would need to have at least 60 minutes of moderate to vigorous physical activity per day to avert negative health effects due to sitting [6, 14].

However, current data show that the majority of moderate to vigorous physical activity in the adult population does not even meet the recommended minimum of 150 minutes per week [15], so that sufficient compensation for the time spent sitting cannot be assumed. Older persons are less likely to spend high amounts of time sitting than younger persons, but older persons are also less likely to
How much do adults sit? Results from the German Health Update (GEDA 2019/2020-EHIS)

### Table 1

<table>
<thead>
<tr>
<th>Sitting</th>
<th>Less than four hours per day</th>
<th>Four to less than six hours per day</th>
<th>Six to less than eight hours per day</th>
<th>At least eight hours per day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (95% CI)</td>
<td>% (95% CI)</td>
<td>% (95% CI)</td>
<td>% (95% CI)</td>
</tr>
<tr>
<td>Total</td>
<td>30.4 (29.5–31.3)</td>
<td>33.4 (32.4–34.3)</td>
<td>16.8 (16.1–17.5)</td>
<td>19.5 (18.7–20.3)</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>33.9 (29.4–38.5)</td>
<td>35.0 (30.7–39.5)</td>
<td>15.3 (9.6–23.5)</td>
<td>19.6 (12.4–29.6)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>23.6 (18.9–28.8)</td>
<td>29.5 (21.1–36.6)</td>
<td>19.0 (15.4–23.1)</td>
<td>23.5 (19.1–28.6)</td>
</tr>
<tr>
<td>High education group</td>
<td>15.6 (10.8–21.9)</td>
<td>24.6 (19.2–31.0)</td>
<td>24.5 (18.9–31.0)</td>
<td>35.4 (28.7–42.6)</td>
</tr>
<tr>
<td>30–44 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>38.7 (35.6–42.0)</td>
<td>27.1 (24.4–30.0)</td>
<td>14.0 (12.2–16.1)</td>
<td>20.1 (17.9–22.6)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>57.0 (44.2–69.0)</td>
<td>18.8 (10.8–30.6)</td>
<td>9.0 (3.9–19.1)</td>
<td>15.2 (8.5–25.7)</td>
</tr>
<tr>
<td>High education group</td>
<td>40.4 (36.2–44.7)</td>
<td>30.7 (26.8–34.9)</td>
<td>11.5 (9.2–14.3)</td>
<td>17.4 (14.5–20.8)</td>
</tr>
<tr>
<td>45–64 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>32.2 (31.2–35.2)</td>
<td>32.4 (30.4–34.4)</td>
<td>16.3 (14.9–17.9)</td>
<td>18.1 (16.7–19.6)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>38.6 (31.4–46.3)</td>
<td>37.8 (30.7–45.5)</td>
<td>13.7 (9.3–19.9)</td>
<td>9.9 (6.2–15.3)</td>
</tr>
<tr>
<td>High education group</td>
<td>33.5 (31.1–35.9)</td>
<td>32.4 (30.1–34.8)</td>
<td>15.8 (14.1–17.7)</td>
<td>18.3 (16.5–20.3)</td>
</tr>
<tr>
<td>≥65 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>28.5 (26.3–30.9)</td>
<td>28.4 (26.3–30.7)</td>
<td>19.8 (18.0–21.8)</td>
<td>23.3 (21.3–25.4)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>33.7 (31.0–36.6)</td>
<td>45.5 (42.7–48.4)</td>
<td>14.4 (12.5–16.6)</td>
<td>6.3 (4.9–8.1)</td>
</tr>
<tr>
<td>High education group</td>
<td>25.8 (23.6–28.3)</td>
<td>32.6 (31.3–34.0)</td>
<td>17.6 (16.6–18.7)</td>
<td>22.3 (21.1–23.5)</td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>23.6 (20.5–27.1)</td>
<td>29.0 (25.6–32.6)</td>
<td>20.6 (17.8–23.7)</td>
<td>26.7 (23.7–30.0)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>22.1 (18.7–25.6)</td>
<td>26.9 (20.1–35.1)</td>
<td>28.7 (21.3–37.4)</td>
<td>22.3 (16.5–29.5)</td>
</tr>
<tr>
<td>High education group</td>
<td>25.3 (21.0–30.1)</td>
<td>32.3 (27.7–37.3)</td>
<td>17.3 (14.1–20.9)</td>
<td>25.1 (21.1–29.7)</td>
</tr>
<tr>
<td>30–44 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>29.8 (26.7–33.0)</td>
<td>26.5 (23.6–29.5)</td>
<td>17.0 (14.8–19.6)</td>
<td>26.7 (24.2–29.5)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>37.0 (25.8–49.8)</td>
<td>28.9 (18.9–41.5)</td>
<td>17.6 (9.7–29.9)</td>
<td>16.5 (9.0–28.1)</td>
</tr>
<tr>
<td>High education group</td>
<td>35.0 (30.5–39.8)</td>
<td>29.4 (25.2–33.9)</td>
<td>15.5 (12.4–19.1)</td>
<td>20.2 (16.9–23.9)</td>
</tr>
<tr>
<td>45–64 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>35.8 (26.9–45.9)</td>
<td>30.9 (22.1–41.3)</td>
<td>9.9 (5.4–17.7)</td>
<td>23.3 (15.5–33.5)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>31.1 (28.1–34.2)</td>
<td>32.4 (29.4–35.6)</td>
<td>14.4 (12.2–16.8)</td>
<td>22.2 (19.5–25.1)</td>
</tr>
<tr>
<td>High education group</td>
<td>19.9 (18.0–21.9)</td>
<td>27.5 (25.4–29.8)</td>
<td>21.5 (19.6–23.5)</td>
<td>31.1 (28.9–33.3)</td>
</tr>
<tr>
<td>≥65 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low education group</td>
<td>27.1 (24.8–29.5)</td>
<td>44.8 (42.1–47.4)</td>
<td>18.1 (16.2–20.3)</td>
<td>10.0 (8.4–11.9)</td>
</tr>
<tr>
<td>Medium education group</td>
<td>25.8 (16.9–37.1)</td>
<td>34.9 (24.8–46.7)</td>
<td>23.5 (14.8–35.3)</td>
<td>15.8 (8.3–28.0)</td>
</tr>
<tr>
<td>High education group</td>
<td>29.5 (26.2–33.1)</td>
<td>45.7 (41.9–49.5)</td>
<td>17.0 (14.4–20.0)</td>
<td>7.8 (6.0–10.0)</td>
</tr>
</tbody>
</table>

Cl=confidence interval. *n*=15

### 18- to 64-year-old women and men sit significantly more often for at least eight hours per day than older women and men.
Among 18- to 64-year-old women and men in the high education group, the proportion with a sitting time of at least 8 hours a day is significantly higher than in the low education group.

Figure 1
Proportion and 95% confidence intervals of women and men with at least four hours of daily time spent sitting and no leisure time physical activity by age (n=11,775 women, n=10,561 men)
Source: GEDA 2019/2020-EHIS

Among 18- to 64-year-old women and men in the high education group, the proportion with a sitting time of at least 8 hours a day is probably not compensated by this group.

Higher time spent sitting of men compared to women and a decrease of high time spent sitting with age are also reported in a current report of the Deutsche Krankenversicherung (DKV-Report 2021) [16]. Based on data from the GEDA study, it could be shown that persons in the high education group perform sedentary activities in the work context more often compared to those in the low education group [17]. Data from DKV-Report 2021 confirms a higher proportion of sitting while working among the higher educated and can at least partially explain the higher time spent sitting of this group.

Based on the reported data, it is not possible to determine which activities were performed while sitting. However, this information would be helpful for assessing the health risk due to sitting. For example, sitting while watching television is associated with an increased health risk, which can probably be attributed to unfavourable snacking behaviour during this time and relatively few interruptions in time spent sitting [5]. Moreover, depending on the activity while sitting, different preventive measures are needed to reduce or shorten the time spent sitting.

The available data on sitting was collected for the first time in the GEDA 2019/2020-EHIS study and allows the description of time spent sitting at the population level. In the interpretation, it should be taken into account that an influence on the results due to self-reporting cannot be excluded. In the context of a validation study, the validity of the question used on sitting was described as moderate [18]. It should also be noted that when the time spent sitting is presented in combination with physical activity, only leisure time physical activity was considered but not work-related physical activity or transportation from place to place. The data collection includes the time before as well as the beginning of the COVID-19 pandemic in Germany. Researchers assume that the necessary measures to control the COVID-19 pandemic have led to a significant decrease in physical activity and an increase in sitting [19]. Possible changes in sitting behaviour due to the pandemic may be reflected in this data, but due to the query of the usual time spent sitting – and the individual view of when an exceptional situation becomes a habit –
cannot be differentiated for the period before and during the pandemic.

Even if there are still uncertainties as to which recommendation is suitable for the ‘optimal’ limitation of time spent sitting, it is becoming apparent that a considerable part of the adult population in Germany endangers their own health due to long times spent sitting and insufficient physical activity. Therefore, preventive measures to reduce time spent sitting are urgently needed. Multi-component interventions that include a combination of knowledge transfer and physical activity-friendly environmental design, such as offering height-adjustable desks at the workplace and reminders to take movement breaks at work, during leisure time and during transport through digital devices, are possible approaches [20, 21].

Corresponding author
Dr Kristin Manz
Robert Koch Institute
Department of Epidemiology and Health Monitoring
General-Pape-Str. 62–66
12101 Berlin, Germany
E-mail: ManzK@rki.de

Please cite this publication as
Manz K, Domanska OM, Kuhnert R, Krug S (2022)
How much do adults sit? Results from the German Health Update (GEDA 2019/2020-EHIS).
DOI 10.25646/10295

The German version of the article is available at:
www.rki.de/journalhealthmonitoring

Data protection and ethics
GEDA 2019/2020-EHIS is subject to strict compliance with the data protection provisions set out in the EU General Data Protection Regulation (GDPR) and the Federal Data Protection Act (BDSG). The Ethics Committee of the Charité – Universitätsmedizin Berlin assessed the ethics of the study and approved the implementation of the study (application number EA2/070/19). Participation in the study was voluntary. The participants were informed about the aims and contents of the study and about data protection. Informed consent was obtained verbally.

Availability of data
The authors confirm that some access restrictions apply to the data underlying the findings. The data set cannot be made publicly available because informed consent from study participants did not cover public deposition of data. However, the minimal data set underlying the findings is archived in the Research Data Centre at the Robert Koch Institute and can be accessed by researchers on reasonable request. On-site access to the data set is possible at the Secure Data Center of the Robert Koch Institute’s Research Data Centre. Requests should be submitted by e-mail to fdz@rki.de.

Funding
GEDA 2019/2020-EHIS was funded by the Robert Koch Institute and the German Federal Ministry of Health.

Conflicts of interest
The authors declared no conflicts of interest.

22.6% of women and 24.3% of men sit at least four hours a day and do not engage in physical activity in their leisure time.
How much do adults sit? Results from the German Health Update (GEDA 2019/2020-EHIS)

Note
The dashboard ‘German Health Update – GEDA 2019/2020’ features more than 40 health indicators in the areas of health behaviour, health care, health status, physical and mental health. These can be selected according to gender, age, education and federal state. The health indicator physical activity, for example, can be found under the category health behaviour. The dashboard is only available in German.

Further information: www.rki.de/geda-dashboard

References
How much do adults sit? Results from the German Health Update (GEDA 2019/2020-EHIS)

