

Journal of Health Monitoring · 2018 3(1)  
DOI 10.17886/RKI-GBE-2018-029  
Robert Koch Institute, Berlin

Elvira Mauz, Benjamin Kuntz,  
Johannes Zeiher, Felicitas Vogelgesang,  
Anne Starker, Thomas Lampert,  
Cornelia Lange

Robert Koch Institute, Berlin  
Department of Epidemiology and Health  
Monitoring



Studie zur Gesundheit von Kindern  
und Jugendlichen in Deutschland

# Developments in smoking behaviour during the transition from adolescence to young adulthood. Results of the KiGGS cohort

📌 SMOKING · TRANSITION · YOUNG ADULTS · HEALTH MONITORING · KIGGS COHORT

## Background

The consumption of tobacco products is regarded as the largest preventable risk factor for a large number of serious diseases. It causes around 121,000 deaths per year in Germany alone [1]. Over the last two decades, various tobacco control measures have been taken and extended over time such as increasing tobacco taxes, advertising bans and implementing age restrictions as well as smoking bans to protect non-smokers from second hand smoke exposure. Overall, tobacco consumption has decreased during this period [2] and the proportion of smokers among children and adolescents declined significantly. However, as a large proportion of the population continues to smoke, reducing tobacco consumption remains one of the key objectives of public health [3, 4]. Smoking in childhood and adolescence may still be experimental in character, but it often proves to be the beginning of a consumption pattern that is highly stable over the life course [5, 6]. In this context, this article uses longitudinal data from the KiGGS cohort to examine trajectories of smoking behaviour during the transition from adolescence to young adulthood.

## Indicator and methodology

The analyses presented here are based on self-reports on current smoking (any smoking, even occasional) and on the age of smoking initiation. The data is taken from the KiGGS cohort, a study that follows the participants of the KiGGS baseline study (2003-2006) [7] into adulthood. The sample includes 2,159 young adults (1,159 women; 1,000 men) aged 19 and 24 years old who have participated again in the first follow-up telephone survey of KiGGS Wave 1 (2009-2012). In total, 57.8% of the original 3,736 14 to 17 year-olds in the KiGGS baseline study with valid information on current smoking at both measurement times were included. Transition probabilities were calculated, that means the percentage probability of the transition from smoking to non-smoking or vice versa from the KiGGS baseline study to KiGGS Wave 1. Socioeconomic status (SES) was determined using the data provided by parents on education, occupation and income at the time of the KiGGS baseline study [8]. Possible bias caused by selective re-participation was partially taken into account through multivariate weighting [7].

## The KiGGS study

The German Health Interview and Examination Survey for Children and Adolescents

**Data owner:** Robert Koch Institute

**Aim:** Providing reliable information on health status, health-related behaviour, living conditions, protective and risk factors, and health care among children, adolescents and young adults living in Germany, with the possibility of trend and longitudinal analyses

**Study design:** Combined cross-sectional and cohort study

### KiGGS survey waves

- ▶ KiGGS baseline study (2003-2006), examination and interview survey
- ▶ KiGGS Wave1 (2009-2012), interview survey
- ▶ KiGGS Wave2 (2014-2017), examination and interview survey

### KiGGS cross-sectional study

**Population:** Children and adolescents with permanent residence in Germany

**Age range:** 0-17 years

### KiGGS cohort study

**Sampling:** Re-invitation of everyone who took part in the KiGGS baseline study (n=17,641) and who was willing to participate in a follow-up

**Age range KiGGS Wave 1:** 6-24 years (n=11,992)

**Age range KiGGS Wave 2:** 10-31 years (n=10,853)

More information is available at [www.kiggs-studie.de/english](http://www.kiggs-studie.de/english)

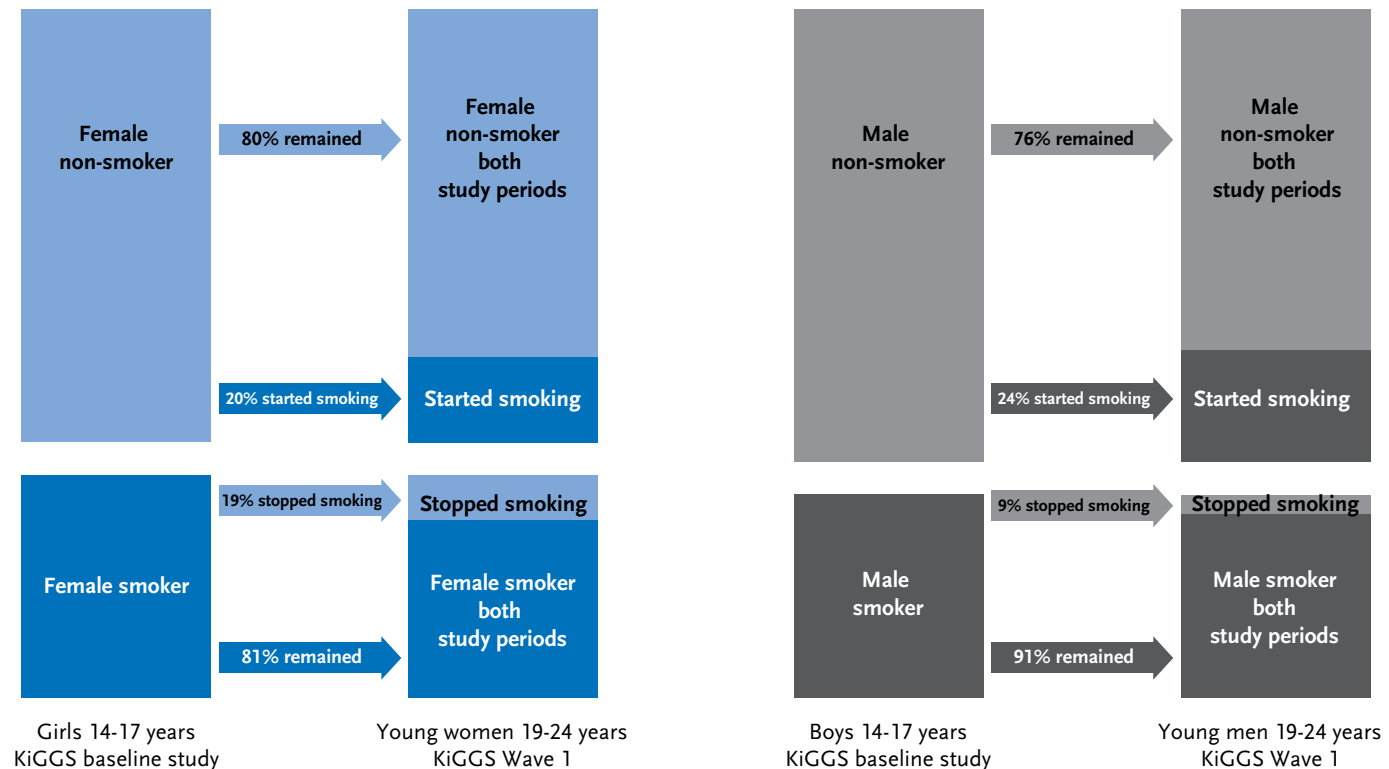
## Results

The proportion of people in the sample who smoked increased from 32% to 43% between the periods during which the KiGGS baseline study and KiGGS Wave 1 were undertaken. 85% of adolescents who smoked and 78% of non-smoking adolescents did not change their smoking behaviour in young adulthood. Whereas 15% of young people who smoked quit smoking between the two survey periods, 22% of non-smokers started smoking during this time. The analyses of data covering the age when a

respondent began to smoke show that almost nine out of ten participants who ever smoked started smoking before the age of 18.

Although no differences were found between the proportions of girls and boys who smoked during adolescence, the proportion of smoking in young adulthood increases more considerable in young men than in women. The main reason for this difference is that women who smoked as adolescents quit smoking significantly more often than men (19% vs. 9%) during the transition into adulthood. At

**Figure 1: Developments in smoking behaviour during the transition from adolescence to young adulthood (n=1,159 female, n=1,000 male)**  
Source: KiGGS baseline study (2003-2006), KiGGS Wave 1 (2009-2012)



the same time, formerly non-smoking male adolescents have started smoking more often; however, this difference is not statistically significant (Figure 1).

Finally, there is a strong correlation between SES and smoking behaviour. For both survey periods, a larger proportion of people in the low status group smoked than in the high status group (KiGGS baseline study: 37% vs. 23%; KiGGS Wave 1: 49% vs. 33%). Non-smoking adolescents with a low SES started smoking more often as young adults, and young smokers with a low SES quit smoking slightly less frequently than those with a high SES. However, these social differences of individual changes are not statistically significant.

### Discussion

The results demonstrate that smoking behaviour remains relatively stable during the transition from adolescence to young adulthood; this finding is in line with the existing literature [6]. A large proportion of non-smoking adolescents do not start smoking during the transition into adulthood; nevertheless, only a minor proportion of the smoking adolescents quit smoking during young adulthood. These figures illustrate the importance of preventing children and adolescents from starting to smoke. In addition, the results indicate that the social differences in smoking behaviour that are already evident among adolescents become stabilised in later life, and therefore contribute to long-term health inequalities. However, it has to be acknowledged that smoking participants with a low SES more often did not take part in KiGGS Wave 1. This may have led to an underestimation of prevalence. It was not possible to completely offset this dropout using weighting.

Trend analyses of the cross-sectional data from KiGGS show that smoking prevalence rates among adolescents in Germany have steadily decreased over the past ten years [3]. However, the results set out here demonstrate that on an individual level the smoking behaviour of the formerly adolescent participants of the KiGGS cohort remains relatively stable during the transition into adulthood; most people who smoked during young adulthood started this behaviour during adolescence. These results illustrate the added value of the longitudinal data gained by continuation of the KiGGS cohort. Future analyses should aim to identify influencing factors that prevent or encourage smoking and that also promote or make it more difficult to quit. The results of such analyses could then be used to develop target group-specific interventions in tobacco prevention and smoking cessation or rather to evaluate the measures that are currently in place.

#### Corresponding author

Elvira Mauz

Robert Koch Institute

Department of Epidemiology and Health Monitoring

General-Pape-Str. 62–66

D-12101 Berlin, Germany

E-mail: [MauzE@rki.de](mailto:MauzE@rki.de)

#### Please cite this publication as

Mauz E, Kuntz B, Zeiher J, Vogelgesang F, Starker A et al. (2018)

Developments in smoking behaviour during the transition from

adolescence to young adulthood. Results of the KiGGS cohort.

Journal of Health Monitoring 3(1): 62-66.

DOI 10.17886/RKI-GBE-2018-029

### Data protection and ethics

The KiGGS baseline study and KiGGS Wave 1 are subject to strict compliance with the data protection provisions set out in the Federal Data Protection Act. Charité – Universitätsmedizin Berlin's ethics committee assessed the ethics of the studies and provided their approval. Participation in the studies was voluntary. The participants and/or their parents/legal guardians were also informed about the aims and contents of the studies, and about data protection. Informed consent was obtained in writing.

### Funding

KiGGS is funded by the Federal Ministry of Health and the Robert Koch Institute.

### Conflicts of interest

The authors declared no conflicts of interest.

### Acknowledgement

Foremost, the authors would like to thank all cohort participants and their parents. We also would like to thank all colleagues at the Robert Koch Institute and especially the study teams. Data collection for the KiGGS cohort could not have been realised without their dedication.

### References

1. Deutsches Krebsforschungszentrum (Ed) (2015) Tabakatlas Deutschland 2015. Pabst Science Publishers, Lengerich
2. Kuntz B, Zeiher J, Lange C et al. (2017) Trends in tobacco sales in Germany. *Journal of Health Monitoring* 2(2):78-84. <http://edoc.rki.de/oa/articles/reOIYccFeel6Y/PDF/23wavhLZOI-bl.pdf> (As at 16.06.2017)
3. Zeiher J, Starker A, Kuntz B (2018) Smoking behaviour among children and adolescents in Germany. Results of the cross-sectional KiGGS Wave 2 study and trends. *Journal of Health Monitoring* 3(1):38-44. [www.rki.de/journalhealthmonitoring-en](http://www.rki.de/journalhealthmonitoring-en) (As at 15.03.2018)
4. Kuntz B, Zeiher J, Lampert T (2017) Tabak - Zahlen und Fakten zum Konsum. In: Deutsche Hauptstelle für Suchtfragen e.V. (Ed) DHS Jahrbuch Sucht 2017. Pabst, Lengerich, P. 51-84
5. Kuntz B, Hoebel J, Lampert T (2014) Bildungsunterschiede im Tabakkonsum und Rauchausstieg junger Erwachsener. Ergebnisse der Studie „Gesundheit in Deutschland aktuell“ (GEDA) 2009 und 2010. *Gesundheitswesen* 76(10):647-654
6. Dutra LM, Glantz SA, Lisha NE et al. (2017) Beyond experimentation: Five trajectories of cigarette smoking in a longitudinal sample of youth. *PLOS ONE* 12(2):e0171808
7. Lange M, Hoffmann R, Mauz E et al. (2018) KiGGS Wave 2 longitudinal component – data collection design and developments in the numbers of participants in the KiGGS cohort. *Journal of Health Monitoring* 3(1):92-107. [www.rki.de/journalhealthmonitoring-en](http://www.rki.de/journalhealthmonitoring-en) (As at 15.03.2018)
8. Lampert T, Müters S, Stolzenberg H et al. (2014) Messung des sozioökonomischen Status in der KiGGS-Studie. *Bundesgesundheitsbl Gesundheitsforsch Gesundheitschutz* 57(7):762-770. <http://edoc.rki.de/oa/articles/reXPIrLy4LMJM/PDF/28BoRAY-r9XdWs.pdf> (As at 07.02.2018)

## Imprint

### Journal of Health Monitoring

#### Publisher

Robert Koch Institute  
Nordufer 20  
D-13353 Berlin, Germany

#### Editors

Susanne Bartig, Johanna Gutsche, Dr Birte Hintzpeter,  
Dr Franziska Prütz, Martina Rabenberg, Alexander Rommel,  
Stefanie Seeling, Martin Thißen, Dr Thomas Ziese  
Robert Koch Institute  
Department of Epidemiology and Health Monitoring  
Unit: Health Reporting  
General-Pape-Str. 62–66  
D-12101 Berlin  
Phone: +49 (0)30-18 754-3400  
E-mail: [healthmonitoring@rki.de](mailto:healthmonitoring@rki.de)  
[www.rki.de/journalhealthmonitoring-en](http://www.rki.de/journalhealthmonitoring-en)

#### Typesetting

Gisela Dugnus, Alexander Krönke, Kerstin Möllerke

#### Translation

Simon Phillips/Tim Jack

ISSN 2511-2708

#### Note

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



This work is licensed under a  
Creative Commons Attribution 4.0  
International License.



The Robert Koch Institute is a Federal Institute within  
the portfolio of the German Federal Ministry of Health