

## Data Observer

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**BAuA-Working Time Survey (BAuA-WTS;  
BAuA-Arbeitszeitbefragung)**

<https://doi.org/10.1515/jbnst-2020-0035>

Received August 17, 2020; accepted August 21, 2020

**Abstract:** BAuA-Working Time Survey (BAuA-WTS) is a micro data panel study covering aspects of working time, other working conditions, health, and well-being. It is representative of people working least 10 h per week in Germany. Data were collected via computer-assisted telephone interviews. So far, three panel waves have been conducted (2015, 2017, and 2019). Further biennial waves are planned. Scientific use files of the first two waves can be accessed at [www.baua.de/forschungsdaten](http://www.baua.de/forschungsdaten) and be used free of charge by the scientific community after registration.

**Keywords:** computer-assisted telephone interviews, employee survey, Germany, panel study, working time

**JEL-Classification:** I18, J2, J8

## 1 Introduction

Global and societal trends are reflected in a changing working world. Amongst others, the shift towards a 24/7 economy, globally acting organisations, and technological advancements in information and communication technology, but also an increasing awareness of the value of free time are affecting employees' working time organisation as well as political discussions about it. However, scientific evidence to objectify these discussions and to give guidance on how to arrange working times is scarce. The Federal Institute for Occupational Safety and Health in Germany (BAuA) introduced the BAuA-Working Time Survey

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(BAuA-WTS) for the following reason: there were no representative data available that specifically monitored employees' working time length, timing, and flexibility, and that at the same provided data on employees' health and well-being. However, only a longitudinal survey design with repeated measurements allows the analysis and identification of short-term and long-term effects of working time aspects on employees' health and well-being. Therefore, the BAuA-WTS was set up as a biennial panel study. As employees' working time arrangements do not stand by themselves, but are linked to and embedded in other employment characteristics and working conditions, the BAuA-WTS covers a broad range of work-related topics. Thus, the data could also be of interest for researchers who do not only focus on working time in their studies.

## 2 Information Covered by the Data

### 2.1 Survey Population

The participants of the BAuA-WTS are employees in Germany, aged 15 years and older (no upper age limit is applied) who work at least 10 paid hours per week in their main job. This includes not only dependent employees but also any type of self-employment. Employments in the course of an apprenticeship, military or community service, a voluntary social/ecological year, and volunteer work are excluded. Persons who interrupted their employment for more than three months during the time of interview conduction do not qualify for participation either. However, all persons who once fulfilled the inclusion criteria are kept in the panel. Panel care measures including non-monetary participant incentives and address tracking were employed to reduce panel attrition and facilitate re-identification of participants.

Table 1 gives an overview of sample characteristics in comparison to the respective sub-sample of the most recent available German microcensus. Moreover, weights were developed to account for the study design and closely calibrate the study data to census data using iterative proportional fitting algorithm. Applied weights (for cross-sectional data) ranged from 0.11 to 10.38 in 2015, from 0.08 to 14.99 in 2017, and from 0.07 to 36.85 in 2019. Longitudinal weights are available for survey waves 2 and 3.

### 2.2 Survey Design

Up to now, three survey waves (2015, 2017, and 2019) were conducted. Further biennial waves are planned. Characteristics of the survey waves are displayed in Table 2.

**Table 1:** Sample description (unweighted data) in comparison to microcensus data.

Characteristics	BAuA- Working Time Survey 2015	Micro- census 2014	BAuA- Working Time Survey 2017	Micro- census 2016	BAuA- Working Time Survey 2019	Micro- census 2018
<i>Gender</i>						
Male	51.7	54.4	52.8	54.3	52.8	54.3
Female	48.3	45.6	47.2	45.7	47.2	45.7
<i>Age (years)</i>						
≤24	3.3	6.0	1.5	5.9	1.5	5.9
25–29	5.7	9.8	3.6	10.3	3.6	10.3
30–34	8.1	11.0	6.0	10.9	6.0	10.9
35–39	9.5	10.6	8.4	10.8	8.4	10.8
40–44	11.1	12.5	9.6	11.1	9.6	11.1
45–49	16.9	15.2	16.0	14.3	16.0	14.3
50–54	19.3	14.5	20.5	15.2	20.5	15.2
55–59	16.2	11.6	19.6	12.3	19.6	12.3
60–64	8.3	6.8	12.4	7.2	12.4	7.2
≥65	1.6	1.9	2.4	2.0	2.4	2.0

**Table 2:** Characteristics of survey waves.

	Wave 1: 2015	Wave 2: 2017	Wave 3: 2019
Data available	Yes	Yes	12/2021
Field time	05/2015–10/2015	05/2017–09/2017	05/2019–01/2020
Number total	n = 20,030	n = 10,459	n = 10,540
Number panel full interview	n/a	n = 6647	n = 6244
Number panel short interview	n/a	n = 799	n = 1158
Refreshment sample	n/a	n = 3013	n = 3138
Cooperation rate (valid interviews/informative contacts belonging to target population)	36.1%	Panel: 61.5% Refreshment: 22.4%	Panel: 59.5% Refreshment: 21.4%
Willingness to take part in next wave	n = 13.778	n = 15.600	n = 12.215

## 2.3 Survey Conduction

A social-science research institute (infas GmbH) collected data via computer-assisted telephone interviews following the Häder–Gabler approach. Several hundred professional interviewers who received a special training before each

wave of data collection conducted the interviews. The interviews lasted about 35–40 min on average.

In order to meet the requirements of a representative study, the survey was carried out on the basis of a random sampling approach according to the latest standards for telephone samples. For the sample of the first survey wave 2015 as well as for the refreshment samples of the survey waves 2 and 3, the basis for the selection was the ADM telephone sample (ADM = Arbeitskreis der Deutscher Markt- und Sozialforschungsinstitute e.V. – Working group of the German market and social research institutes). This enabled a controlled drawing according to regional and other parameters. The phone numbers used contain both listed phone numbers and randomly generated phone numbers. This means that households that are not listed in a telephone book can also be reached. Landline (70%) as well as mobile numbers (30%) were used. At first language contact, it is unknown whether a contacted household or person is part of the study population. Therefore, a screening and selection process was conducted during the first language contact to identify the target person.

For the panel participants in survey waves 2 and 3, contact details were available from an earlier wave. These persons or their households were contacted directly, and the available information such as age and gender were used to identify the correct target person. Those participants who provided their postal address were informed about the next survey wave via a letter before they were called.

The BAuA-WTS received ethical approval from the BAuA ethics committee (24.04.2017, 19.12.2019). No external funding was received.

## 2.4 Questionnaire Content

The data include survey responses on an individual level. The core of the questionnaire was kept constant across the different waves. However, modules on focus topics were exchanged between waves. Table 3 gives an overview on the topics covered in the questionnaire.

## 2.5 Data Preparation

Several measures throughout the data production process were taken to ensure data quality. The initial questionnaire was developed with the support of national and international working time experts to ensure the inclusion of all important and current topics. Since then, the status of the survey including ideas for upcoming

**Table 3:** Overview of the content of the BAuA-Working Time Survey.

Questionnaire modules	Example topics
Employment and organisational characteristics	Current occupational activity <sup>a;b;c</sup> , employment status <sup>a;b;c</sup> , job change <sup>b;c</sup> , job tenure <sup>a;b;c</sup> , economic branch <sup>a;b;c</sup> , company size <sup>a;b;c</sup> , changes in the work environment <sup>a;b;c</sup> , basic work <sup>c</sup> , job insecurity <sup>a;b;c</sup> , works committee/employee organisation <sup>a;b;c</sup> , leading position <sup>a;b;c</sup>
Working conditions	Mental vs physical work <sup>b;c</sup> , physical working conditions <sup>a;b;c</sup> , ambient working conditions <sup>a;b;c</sup> , scope for decision-making <sup>a;b;c</sup> , social support at work <sup>a;b;c</sup> , work intensity <sup>a;b;c</sup> , emotional demands <sup>a;b;c</sup> , psychological demands <sup>a</sup> , office job <sup>a;b;c</sup> , work at production lines, and machines <sup>a</sup>
Working time	Contractually agreed working hours <sup>a;b;c</sup> , actual working hours <sup>a;b;c</sup> , preferred working hours <sup>a;b;c</sup> , partial retirement agreement <sup>a;b</sup> , reason for part-time work <sup>a</sup> , reason for overtime time work <sup>b;c</sup> , compensation of overtime hours <sup>a;b;c</sup> , work days per week <sup>a;b;c</sup> , fixed time for start/end of work <sup>a;b;c</sup> , time for start/end of work <sup>a;b;c</sup> , flexitime <sup>a;b;c</sup> , normal work hours between 7 am and 7 pm <sup>a;b;c</sup> , short rest periods <sup>b;c</sup> , shift work characteristics <sup>a;b;c</sup> , night work characteristics <sup>a;b;c</sup> , weekend work <sup>a;b;c</sup> , on-call work <sup>a;b;c</sup> , variability of working hours <sup>b;c</sup> , changes in work hours <sup>a;b;c</sup> , breaks <sup>a;b;c</sup> , working time accounts <sup>a;c</sup> , extended work availability <sup>a;b;c</sup>
Mobility	Commuting time <sup>a;b;c</sup> , work on the way to and from work <sup>b</sup> , home office agreement <sup>a;b;c</sup> , reason for no home office agreement <sup>b;c</sup> , work at home <sup>b;c</sup> , mobile work <sup>b;c</sup> , business trips <sup>b</sup>
Digitalization/new technologies	Use of modern communication technology <sup>a;c</sup> , use of new technologies <sup>c</sup> , change of work through new technologies <sup>c</sup> , technology affinity <sup>c</sup>
Health, well-being, and work-life balance	Subjective health status <sup>a;b;c</sup> , psychosomatic complaints <sup>a;b;c</sup> , sleep quality <sup>a;b;c</sup> , work ability <sup>a;b;c</sup> , work satisfaction <sup>a;b;c</sup> , compatibility between work and private life <sup>a;b;c</sup> , recovery experiences <sup>b;c</sup> , occupational self-efficacy <sup>a;b;c</sup> , desired retirement age <sup>a;b;c</sup> , reasons for work during retirement <sup>b;c</sup>
Secondary employment	Job and employment characteristics, working conditions, working time for one <sup>b;c</sup> to up to three additional jobs <sup>a</sup>
Demographics and private life	Age <sup>a;b;c</sup> , sex <sup>a;b;c</sup> , household composition <sup>a;b;c</sup> , age of youngest child <sup>a;b;c</sup> , education <sup>a;b;c</sup> , citizenship <sup>a;b;c</sup> , partner/marital status <sup>a;b;c</sup> , working hours of partner <sup>a;b;c</sup> , care work <sup>b;c</sup> , social support at home <sup>b;c</sup> , income <sup>a;b;c</sup>

<sup>a</sup> in wave 1 (2015).

<sup>b</sup> in wave 2 (2017).

<sup>c</sup> in wave 3 (2019).

waves is presented to and discussed with national and international working time researchers on a regular basis. After programming, the questionnaire was extensively tested within the research team and the institute that was responsible for the programming and conduction of interviews. Professional interviewers received study specific training. Pretests allowed for final adaptation. Constant surveillance of interview conduction and field development supports good quality of the data.

The data are checked intensively for implausible values before the scientific use files are produced.

To ensure factual anonymisation, indirect identifiers were coarsened to form broader categories. Information on occupational activity was coded according to the International Standard Code of Occupation 2008 (ISCO-08; 2- and 3-digit-codes) and the Classification of Occupations (KldB 2010; 2- and 3-digit-codes). Information on economic branch was coded according to Classification of Economic Activities (WZ 2008; 2-digit code).

### 3 Earlier, Current and Future Data Use

The aim of the introduction of the BAuA-Working Time Survey was twofold: first, the provision of timely representative data as well as developments of working time and related working conditions in Germany to inform politics and to objectify public debates in this context. Second, the aim was to provide high quality panel data for researchers to conduct their studies in the field of working time and health and related research fields.

Examples of data use are monitoring reports such as the BAuA-working time report (Wöhrmann et al. 2016). Moreover, the data also provide the empirical basis for parliamentary requests (e.g. Deutscher Bundestag 2019) and other policy advising activities, for instance regarding flexible work hours, overtime, and telework. Examples of scholarly research based on the BAuA-Working Time Survey data are a latent class analysis on health and work-life balance across different work schedules (Brauner et al. 2019) and a comparative analysis on working time and well-being amongst health care professionals in Germany and Finland (Karhula et al. 2020).

An up-to-date citation list for work published on the data resource is available at [https://www.baua.de/DE/Aufgaben/Forschung/Forschungsdaten/pdf/Publikationsliste-AZB.pdf?\\_\\_blob=publicationFile&v=2](https://www.baua.de/DE/Aufgaben/Forschung/Forschungsdaten/pdf/Publikationsliste-AZB.pdf?__blob=publicationFile&v=2). Within our institution, amongst others, publications concerning the following topics are planned or under preparation:

- Length, location, flexibility, and variability of work hours;
- Telework and work-related mobility;
- Extended work availability and on-call work;
- Recovery and rest periods;
- Shift work;
- Interactive and care work;
- Working time preferences;
- Working time and retirement;

- Health and self-endangering work behaviours;
- Work-life balance and private responsibilities.

The BAuA-Working Time Survey is a valuable data resource with a unique focus on working time. The measures used range from demographics over the measurement of the work situation and subjective health and well-being to psychological measures of constructs like occupational self-efficacy. Thus, the data provide study possibilities for researchers from a broad range of disciplines to complement their research. The BAuA-Working Time Survey contains longitudinal data from large samples being representative of most of the German workforce and therefore covers not only all occupations and economic branches but also all types of employment – including the self-employed. Due to the manifold topics covered in large samples in a longitudinal study, the data provide multiple potentials for future data use, including:

- comparisons with other countries where data like these exist,
- analyses in specific branches or occupations,
- trend analyses,
- the different waves can be linked to allow longitudinal analyses of how working conditions especially working time conditions affect employees' health and well-being over time.

However, it has to be noted that due to sampling via randomly generated telephone numbers, it is not possible to link the data on a person level to registry data.

## 4 Data Access and Documentation

Data access to scientific use files of the BAuA-Working Time Survey is free of charge. Data are provided as SPSS files. The following scientific use files are currently available:

- BAuA-AZB2015\_SUF\_1 (Version 1, doi: 10.21934/baua.azb15.suf.1)
- BAuA-AZB2017\_SUF\_1 (Version 1, doi: 10.21934/baua.azb17.suf.1)

Currently, no campus use files are available.

A prerequisite for data access is an application for data transfer. Interested researchers need to complete an application form, which is available at the BAuA research data centre at [www.baua.de/forschungsdaten](http://www.baua.de/forschungsdaten). The signed form has to be sent by post to the following address: Federal Institute for Occupational Safety and Health (BAuA); Department 6 – Research Data; Nöldnerstr. 40–42; 10317 Berlin.

BAuA decides on the transfer of the data based on the submitted documents. This formal verification process aims at warranting the data protection guaranteed to the respondents and ensuring that the data are used exclusively for the purposes of independent non-commercial scientific research. If the application is approved, a data usage contract will be drawn up, which must be signed by both sides. Then, the scientific use files will be sent on an encrypted data medium by post.

Eligible for data access are institutionally affiliated scientists with a doctorate or comparable academic achievement. In addition, students and doctoral students can use the BAuA's scientific use files for their theses or dissertations. For this purpose, the supervising professor with the same affiliation must submit and sign an application to conclude a data usage contract. The contractual partner is responsible for ensuring all data protection requirements. Individuals (without affiliation) cannot be granted access to the scientific use files.

Methods reports including a basic version of the questionnaire (Häring et al. 2016, 2018, 2020) and data documentations (Brauner et al. 2019a, 2019b) can be accessed at [www.baua.de/forschungsdaten](http://www.baua.de/forschungsdaten). Additional documentation regarding the data (questionnaire programming, item response list) will be provided upon approval of application. The data and accompanying documentation are only available in German language. Thus cooperating with a German speaking researcher for data application and analyses is strongly advised.

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