

Data Observer

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Establishments in the Covid-19-Crisis (BeCovid): A High-Frequency Establishment Survey to Monitor the Impact of the Covid-19 Pandemic

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Abstract: The high-frequency establishment survey “Establishments in the Covid-19-Crisis” (BeCovid) started in 2020 and continued until June 2022 to collect monthly data on how businesses in Germany adjusted to the challenges of the pandemic. This article describes the survey design and provides an overview over the topics covered. We further outline the survey’s research potentials, particularly when linked to administrative records.

Keywords: establishment survey, COVID-19 pandemic, labor market, short-time work, working from home

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1 Introduction

The Covid-19 pandemic as well as the measures that were imposed to contain its spread led to an unprecedented environment for doing business. Some

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establishments were legally required to temporarily suspend their operations and work safety took on a major role in day-to-day business operations. With the pandemic situation dragging on, the Institute for Employment Research (IAB) – partially in cooperation with Federal Institute for Occupational Safety and Health (BAuA) and the excellence cluster *ECONtribute* at the universities of Cologne and Bonn – designed an unique establishment survey to assess how establishments were affected by the pandemic-induced economic crisis and which strategies they pursued to cope with the crisis's ramifications: *Establishments in the Covid-19-Crisis* (BeCovid). This survey of establishments in Germany started in August of 2020 and is planned to run for a total of 24 waves (covering a rotating panel of 1500 to 2000 establishments per wave), ending in June 2022. Data collection is performed by *Kantar Public* and is done via computer-assisted telephone interviews (CATI) lasting approximately 10 min on average. The survey's high frequency was explicitly motivated by the dynamic pandemic in order to provide timely and representative data on the situation of the establishments in a quickly changing environment that necessitated frequent policy action. Another goal of the survey was to create a data set that can be used in (later) research to identify the pandemic's longer-term effects on establishments and workers, in combination with administrative data that can be linked to the survey.

The survey's roughly monthly frequency is the main difference to other data covering establishments. Compared to the administrative data of the Federal Employment Agency (BA), one advantage of BeCovid was that representative results were available shortly after the survey was conducted (whereas some administrative data and even most larger surveys have lags of up to one year or more), allowing for the provision of timely data with high policy relevance, e.g. with respect to the effects on the German system of vocational training and education (Bellmann et al. 2020). Relative to other establishment surveys like the yearly IAB Establishment Panel, BeCovid – next to the fast availability of results – distinguishes itself through the breadth of topics that were covered across the waves, sometimes on short notice (also see Section 3). For example, Bellmann et al. (2021a) show which establishments participated in the vaccination campaign against COVID-19 in the summer of 2021.

This paper is organized as follows: Section 2 covers the survey design and data quality in a detailed manner. Section 3 outlines the structure of the questionnaires and provides an overview of the diverse range of topics which the survey has covered throughout the pandemic. Section 4 details how the data can be accessed via the Research Data Center at the IAB, discusses the survey's analysis potential, especially when linked with administrative data sources, and concludes.

2 Survey Design, Data Collection, and Weighting

In this section, we describe the survey's design, how the data were collected and the weighting scheme, covering the relevant aspects. The minutiae of all those procedures and further details are spelled out in our data report (Backhaus et al. 2021).

2.1 Design of the Survey and Data Collection

The survey's target population comprises all establishments with at least one employee subject to social security contributions, but excludes the public sector, private households, and extraterritorial organisations. Hence, it covers the entire private sector in Germany. Our sampling frame is the establishment file of the Federal Employment Agency, which contains all establishments (without the aforementioned entities) that have to submit employee notifications to the in social security system. In this context, an establishment is defined as a regionally and economically separate unit with employees that is assigned its own unique establishment identifier. In practice, this entails, e.g., that plants of the same company at different locations are treated as their own establishments. Moreover, this establishment definition is identical to other data from the IAB, like the Establishment Panel (Ellguth et al. 2014) or the administrative Establishment History Panel (Ganzer et al. 2021). The sample is drawn via disproportionate sampling, stratified by establishment size (1–9, 10–49, 50–249, and 250+ employees) interacted with five broad economic sectors. Large establishments with more than 250 employees are defined to be one stratum, irrespective of their sector, resulting in a total of 16 strata.

For each individual wave, the sample is divided into two parts: A refreshment sample consisting of establishments that have not yet been surveyed at any time during the study, and a repeat sample of establishments that had, in a previous wave, given their consent to be surveyed again (or those that had not yet been successfully contacted). Initially, an establishment was rotated out of the sample after a maximum of six participations. Other reasons for dropping out of the (repeat) sample were no participation for seven straight waves after the first-time interview and an establishment's last participation being more than four waves ago. These measures are applied to prevent biases due to cluster effects of establishments that are particularly willing to participate, but also to survey a larger variety of establishments throughout the study to keep the burden low for the participants. From wave 17 onwards, however, those restrictions were lifted for

large establishments (250+ employees) in order to ensure an ample supply of possible participants, such that the goal of at least 150 large establishments per wave can be realized up until the end of the study.

Table 1 provides an overview of how many interviews were conducted successfully during each wave, which share of these was repeat respondents, and the wave's overall response rate. After varying between 1500 and 2000 for the first seven waves due to budget restrictions, the targeted sample size of roughly 2000 was consistently met in the subsequent waves. In total, across the first 23 waves, 17,772 establishments participated in the survey for a total of 43,973 observations. Starting with the third wave, the proportion of repeat respondents hovered around an envisaged level of roughly 60%. The only exception is the reduced share in

Table 1: Sample sizes and response rates of BeCovid.

Wave and field period	Successful interviews	Share of repeat respondents (in %)	Response rate (in %)
1 (03.08. – 18.08.2020)	1723	0	14.27
2 (25.08. – 04.09.2020)	1556	46.08	17.29
3 (14.09. – 25.09.2020)	1733	59.67	21.10
4 (05.10. – 19.10.2020)	1794	61.03	14.11
5 (26.10. – 09.11.2020)	1760	68.62	17.00
6 (16.11. – 27.11.2020)	2001	61.02	17.62
7 (07.12. – 18.12.2020)	1511	66.91	16.23
8 (18.01. – 29.01.2021)	1999	45.77	16.08
9 (08.02. – 19.02.2021)	2000	65.55	19.04
10 (01.03. – 12.03.2021)	2002	66.28	17.35
11 (22.03. – 07.04.2021)	2009	62.67	14.49
12 (19.04. – 30.04.2021)	2001	69.97	23.57
13 (10.05. – 26.05.2021)	2001	64.48	18.16
14 (07.06. – 18.06.2021)	2001	60.22	17.11
15 (05.07. – 20.07.2021)	2002	60.14	14.79
16 (02.08. – 17.08.2021)	1903	54.77	12.30
17 (06.09. – 20.09.2021)	2010	59.85	18.71
18 (04.10. – 19.10.2021)	2001	61.01	14.90
19 (02.11. – 16.11.2021)	2000	60.25	16.37
20 (01.12. – 14.12.2021)	2000	60.00	16.23
21 (13.01. – 28.01.2022)	2000	64.49	15.88
22 (01.03. – 16.03.2022)	1999	66.28	20.84
23 (02.05. – 20.05.2022)	1978	65.48	TBD
24 (13.06. – 30.06.2022)	TBD	TBD	TBD

Response rates were calculated based on the effective gross sample of each wave, which comprises all establishments that were contacted at least once during the field period. The calculation follows the suggestions made in AAPOR (2016) for establishment surveys that include a pre-screening interview for eligibility.

wave 8 (46%), caused by the fact that, for the first time, a large part of the repeat sample was rotated out due the aforementioned rules. There is a great deal of variation in the wave-specific response rates, ranging from 12.3% to 23.6%. A reason for this lies in the confluence of short field periods and seasonal effects. Contacting respondents which are authorized to respond to surveys for their establishment was less successful during vacation periods and resulted more often in appointments for participation in a subsequent wave or in refusals, examples include wave 11 during Easter 2021 or wave 16 in that year's summer vacation period. Similarly, during lockdown periods, particularly affected economic sectors such as accommodation or food services were more difficult to reach. Another, mechanical, reason for differing response rates is the varying number of repeat respondents that were available to contact in each wave, since prior respondents are more likely to participate than those establishments that have not been interviewed. An alternative way to calculate and interpret response rates in a high-frequency panel survey is based on the percentage of establishments that participated at least once throughout the entire study period. This preliminary total response rate is 22% through the first 22 waves, although this value has to be interpreted with caution as recently drawn establishments were contacted fewer times than other ones.

The main instrument of the survey is a questionnaire designed for a standardized CATI interview,¹ containing questions that are only addressed to establishments surveyed for the first time, panel questions that are asked in each wave and questions on one or more thematic subjects (see Section 3 below for more details on the survey's contents). The questionnaires were developed by IAB researchers and various project partners. A particular challenge concerns the very short time intervals between the waves, so that the time for developing and changing questionnaires is limited, while the pandemic situation itself further required swift adjustments to some questions (e.g. concerning lockdown).

Still, many efforts are made to ensure that the instrument undergoes rigorous testing prior to the field phase. A cognitive pretest (~10–15 interviews) is conducted by IAB staff and focuses on the new questions of the wave in question. In this pretest, emphasis is placed on whether and how respondents understand and react to the questions. A second pretest (~100 interviews) checks the entire instrument and is conducted in the telephone studio of the survey institute *Kantar Public* under the usual field conditions. The reporting mainly includes analyses of item non-response, interviewer notes, and the duration of the questions. The results of both pretests are jointly considered in the revision of the questionnaire.

¹ Waves 11 and 23 also contained vignette studies (see Section 3). Part of the wave 23 respondents were additionally invited for a self-administered web survey.

Before the first participation, all establishments receive a postal cover letter to invite participation, signed by the head of the Federal Employment Agency and the director of the IAB. The cover letter points out the nature of a short telephone interview which is designed to address the economic problems of the Corona crisis. A second page of the cover letter includes information on data protection.

2.2 The Weighting Scheme

Given the targeted establishment population of the private sector, weights are available to obtain representative results. Whether weights should be applied, however, depends on the research interest at hand (Solon et al. 2015). In BeCovid, weights are constructed to make the sample of every wave representative of the German private sector economy; no panel weights are generated. This entails that the same establishment taking part in two different waves will not have the exact same weight as the sample composition varies across waves. Creation of the weights comprises a procedure in three broad steps. The first step utilizes administrative data from the establishment file to calculate the probability of inclusion that is solely based on the design. The second step updates these design-based weights, building on additional field-, contact, and administrative data to correct for potential selection effects that arise due to unit-nonresponse. Using generalized regression, the third step calibrates the weights. Final, calibrated weights allow for representative analyses by East and West Germany and by the aggregated sectors and establishment size classes which define the strata.

During the survey's first year, another set of weights was generated through adjustments in the second step which are connected to short-time work (STW), a leading indicator of crisis severity during the pandemic. Estimated amounts of the total workers and establishments in STW from BeCovid turned out to be significantly higher than benchmarks from the BA that have a time lag of six months. With the possibility of linking the survey to administrative data on the establishments' STW usage from the BA (resulting from the survey's definition of an establishment), comparisons show that establishments receiving support in the form of STW are more likely to participate in the survey. This is probably explained by the fact that the BA pays out the STW support and is also a sponsor of the survey as evident to the establishments from the cover letter inviting participation. Hence, for example, establishments receiving support from the BA in the form of STW might participate in the BA-sponsored survey as a token of gratitude. As a consequence, the results on STW were no longer representative of the private-sector economy. Given the data linkage, however, the increased likelihood

of participation for STW establishments can be adjusted for in the weights construction's by correcting for this particular instance of non-response bias. Correspondingly, the data come with a refined set of weights that restores representativeness with respect to STW. Results that are not connected to STW specifically, however, are mostly unaffected when comparing the original and refined weights. Further details on this are presented in Fitzenberger et al. (2021) who also show that other firm surveys similarly overestimated STW numbers. Intrinsically, due to the institutional set-up of STW in Germany with employers having up to three months to settle their claims, the STW numbers elicited during the survey that asked for a tally of a not yet completed month should be read as an estimate from the establishment's side (Kagerl et al. 2022). Exact figures for the surveyed establishments can be obtained ex post from administrative data, also see Section 4.

3 Contents of the Survey

The structure of each wave's questionnaire is threefold. First, there is a set of structural questions that is only posed to establishments when they participate for the first time. This part covers information that is assumed not to change in the short run, e.g. whether an establishment is part of a larger company or is its own firm, whether the establishment is foreign-owned or whether a works council exists. This type of information is carried over for subsequent participations of the establishment. Second, there is a set of panel questions which are asked repeatedly in every wave, irrespective of how often an establishment has participated already. Broadly, these types of questions include the topics workforce development, liquidity reserves and the effects and extent of the pandemic effects. The latter category is proxied by various instruments, e.g. subjective ramification assessments, the number of people in STW or whether the currently active set of pandemic restrictions requires the establishment to close down entirely. Third, taking up about half the available survey time, are module questions that flexibly change every wave that make up the thematic breadth of BeCovid and thus constitute the waves' focal points.

Table 2 gives an overview of the topics that were covered in the survey, ordered chronologically by when the waves took place. Regarding the modules, two further aspects noteworthy: First, while some flexible modules have one clear overarching theme, others are a collection of multiple topics. For instance, some questions were added in response to developments in current affairs, like asking about the establishments' provision of rapid tests for the Coronavirus (waves 11 and 12) or about vaccinations (waves 14 and 16). Second, some themes re-occur a number of

Table 2: Overview of topics in the flexible modules of BeCovid.

Wave	Topic(s)	Field work period
1	Impact of pandemic; short-time work (STW)	03.08. – 18.08.2020
2 ^a	Work safety	25.08. – 04.09.2020
3	Vocational training	14.09. – 25.09.2020
4 ^a	Working from home (WFH)	05.10. – 19.10.2020
5	Firm-provided further training	26.10. – 09.11.2020
6	Future trends; exports; lockdown	16.11. – 27.11.2020
7	Vocational training; international recruitment	07.12. – 18-12.2020
8	Minimum wage and wage policies; WFH; STW; lockdown	18.01. – 29.01.2021
9	Digitalization	08.02. – 19.02.2021
10	Vocational training; WFH	01.03. – 12.03.2021
11	Vignette study on hiring behavior for atypical employment; Covid-19 rapid tests; WFH	22.03. – 07.04.2021
12	Management practices; Covid-19 rapid tests; WFH; STW	19.04. – 30.04.2021
13 ^b	Organization of work	10.05. – 26.05.2021
14 ^a	Mental health measures	07.06. – 18.06.2021
15	Financial situation, employment development, and representation of interest; WFH	05.07. – 20.07.2021
16 ^a	Work safety; vaccinations; imports and supply chains	02.08. – 17.08.2021
17	Vocational training	06.09. – 20.09.2021
18	Women in management, corporate culture, and work–life-balance	04.10. – 19.10.2021
19	WFH	02.11. – 16.11.2021
20	Imports and supply chains	01.12. – 14.12.2021
21	Vocational training; internships	13.01. – 28.01.2022
22	Labor demand and scarcity	01.03. – 16.03.2022
23	Vignette study on hiring of apprentices; effects of Ukraine war	02.05. – 20.05.2022
24	Planned: WFH; effects of Ukraine war	Scheduled June 2022

^adenotes waves that were in official cooperation (i.e. at least partial financing) with BAuA. ^bmarks the 13th wave that took place in official cooperation with *ECONtribute*. The table's construction is partially adapted from Backhaus et al. (2021), which also lists other cooperation partners.

times owing to their importance, e.g. vocational training or working from home. This, however, does not necessarily imply that questions repeat themselves. Continuing the two examples, the questionnaires covering vocational training and education often approach the topic from slightly different angles with differing aims; hence the questions mostly do not overlap. However, some questions on the possibility of working from home, its extent within the establishment and its intended future usage, for example, were repeated. We recommend that users consult the questionnaires and note the systematics of the variable names, which

also provide information on such changes.² Information on the naming conventions around the variables are provided in Backhaus et al. (2021).

Overall, the themes are diverse and cover most of the often-discussed issues of the pandemic in relation to businesses: How establishments were affected by the crisis and by government regulations and lockdowns, how they approached work safety, the role of working from home, digitalization efforts, changes in training and labor demand with a focus on the vocational education system, the repercussions of snarled supply chains from 2021 onwards as well as the impacts of the war in Ukraine in 2022.

4 Data Access and Analysis Potential

Access to the BeCovid data is possible via the Research Data Center (FDZ) at the IAB, with both on-site use and remote data access available. Researchers intending to utilize the weakly anonymized data are required to apply for data access.³ As direct data access is only possible on-site, test data are also available at the FDZ for researchers to build and test their own programs. These test data match the structure of the actual data, but cannot be used for valid analyses as the variables' values are artificially generated.

BeCovid data lend themselves to different types of analyses. For one, the survey data allow tracking the different phases of the pandemic and their consequences at a high temporal resolution, e.g. in IAB (2022). Another example utilizing the time series is Bellmann et al. (2021b), who show how the share of establishments offering working from home (WFH) to their employees rose throughout the crisis to 50% until July 2021 and how the untapped potential of WFH as well as the establishments' WFH plans have developed over the course of the pandemic. In addition, courtesy of the module structure, the data allow investigating a broad range of specific topics in a cross-sectional manner. For instance, Bellmann et al. (2021c) note that the pandemic has led to acceleration in the diffusion of digital technologies, in part by spurring investments in digitalization efforts. A major advantage of the survey is the possibility of linking the data to existing administrative records, which more than 90% of establishments consented to. Access via the FDZ can be extended to include characteristics from the Establishment History Panel (BHP; see Ganzer et al. 2021 for details). This makes it possible to observe the

² Questionnaires and additional resources are available at the Research Data Centre at the IAB: https://fdz.iab.de/de/FDZ_Establishment_Data/iab_becovid.aspx. See also Section 4 for more information regarding data access.

³ Details can be found on the website of the FDZ: https://fdz.iab.de/en/FDZ_Data_Access.aspx.

establishments' workforce composition and in particular the employment trends prior to the pandemic. Using BeCovid data merged with data from the BHP, Fackler et al. (2021), e.g., investigate the role works councils play with respect to employment stability during the crisis.

The data are moreover amenable to future research that aims to quantify labor market effects on both establishments and workers. In cooperation with the IAB, this is possible as records on STW as well as the full employment biographies (vom Berge et al. 2021) of the surveyed establishments' workers can be linked. Given that, in early 2022, the pandemic was not yet over and that the administrative records have a significant time delay, the survey's analysis potential will only increase with more administrative data coming in for the period after the acute crisis's time span, opening up avenues for fruitful research.

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