

Wanger, Susanne; Weber, Enzo

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## Sickness absence due to Covid test obligations in the workplace

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# IAB-DISCUSSION PAPER

Articles on labour market issues

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## 7|2022 Sickness Absence due to Covid Test Obligations in the Workplace

Susanne Wanger, Enzo Weber

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# Sickness Absence due to Covid Test Obligations in the Workplace

Susanne Wanger (IAB)

Enzo Weber (IAB)

Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

The “IAB Discussion Paper” is published by the research institute of the German Federal Employment Agency in order to intensify the dialogue with the scientific community. The prompt publication of the latest research results via the internet intends to stimulate criticism and to ensure research quality at an early stage before printing.

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## Abstract

As vaccines for Covid-19 became available, in 2021 many countries introduced an obligation for employees to provide proof of their Covid status in the workplace, in Germany also known as the 3G rule (vaccinated, recovered, tested). In view of the controversial debate, concerns arose that employees might attempt to circumvent this obligation by taking sick leave. For an empirical panel analysis we combine data from health insurance providers with epidemiological data for the German federal states. In fact, our findings do show that – while controlling for infection rates – a one percentage-point lower vaccination rate led to an increase in the sickness absence rate by 0.021 percentage points when the 3G rule came into effect.

## Zusammenfassung

Mit der Verfügbarkeit von Corona-Impfstoffen führten viele Länder im Jahr 2021 die Verpflichtung ein, am Arbeitsplatz Impf-, Genesenen- oder Testzertifikate nachzuweisen, in Deutschland auch bekannt als 3G-Regel (geimpft, genesen, getestet). Angesichts der kontroversen Debatten wurden Befürchtungen laut, dass Beschäftigte versuchen könnten, sich dieser Nachweispflicht zu entziehen, indem sie sich krankschreiben lassen. Für eine empirische Panel-Analyse kombinieren wir Krankenkassendaten und epidemiologische Daten für die deutschen Bundesländer. In der Tat zeigen unsere Ergebnisse, dass – unter Kontrolle der Infektionsinzidenz – eine um einen Prozentpunkt niedrigere Impfquote mit Inkrafttreten von 3G zu einem um 0,021 Prozentpunkte höheren Krankenstand führte.

## JEL classification

H12; I10; J81

## Keywords

Covid-status certification; Covid-19; Sick leave; Workplace

## Acknowledgements

We are grateful to Benjamin Lochner für helpful comments.

# 1 Introduction

The Covid-19 pandemic caused not only recessions with declining demand, but also large-scale decreases in hours worked (Anderton et al. 2021), in particular resulting from the widespread use of short-time work arrangements (Herzog-Stein et al. 2021). However, on the employee side, too, the number of hours worked fell due to Covid-19. The reasons included Covid infections (OECD 2021, Jannsen 2022), quarantine periods (Busato et al. 2021, Wanger/Weber 2022) and the absence of parents owing to the closure of schools and childcare facilities (Collins et al. 2020, Fuchs-Schündeln et al. 2020, Reichelt et al. 2021). In Germany just under 40 percent of the establishments report such employee-side decreases in hours worked in January 2022 (IAB 2022a).

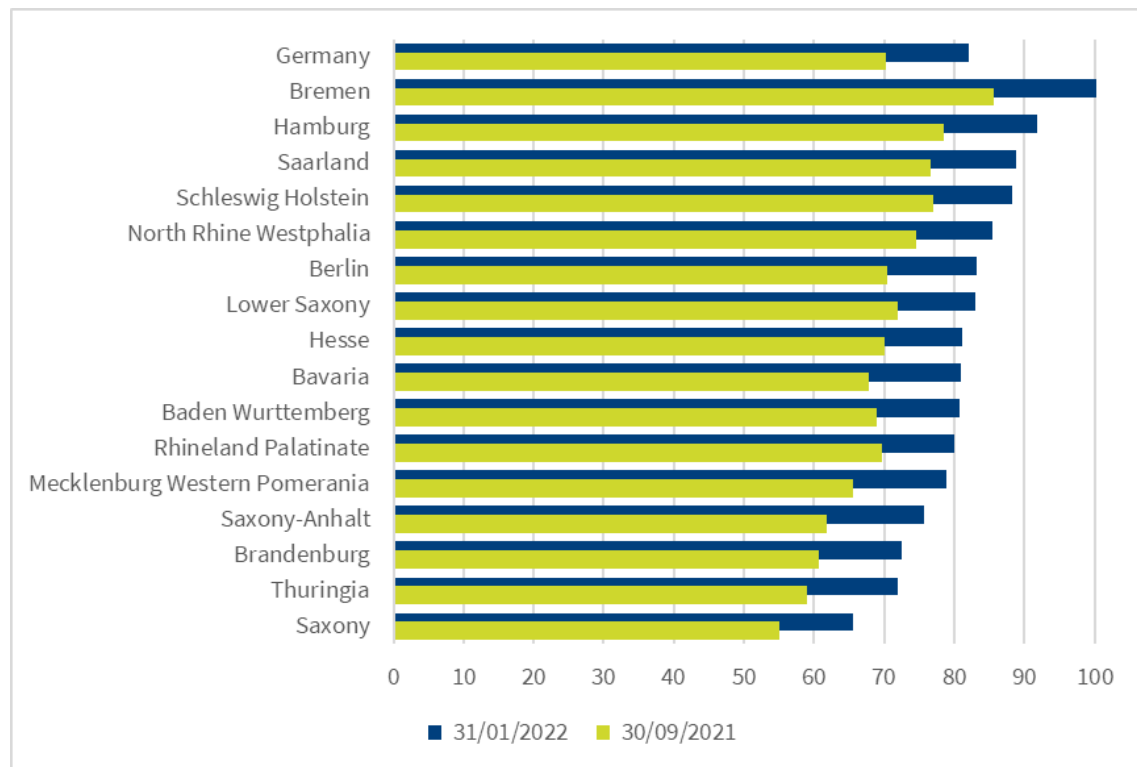
In this study we examine a further possible cause of decreases in hours worked. In 2021 many countries introduced an obligation for employees to prove their Covid status in their workplace (Drury et al. 2021) in order to reduce the risk of infection at work, especially in cases where homeworking is not possible (Rosella et al. 2022). In this way chains of infection can be broken at an early stage and large outbreaks in organisations can be prevented. For unvaccinated people, this may mean having to conduct a Covid-19 test on every working day. This could lead to evasion reactions among employees who, for example, oppose a test obligation and are annoyed about it. There were thus concerns that employees could attempt to circumvent this obligation by taking sick leave. This must also be seen in the light of the fact that debates surrounding Covid-19 policies have often been very intensive and ideological. We call such an evasion effect the “3G effect”.

The few findings available regarding the effects of mandatory certificates proving vaccination, recovery or tests in the workplace indicate that changes in behaviour can occur (see Drury et al. 2021 for an overview). There is evidence, for instance, that restricting access to the workplace to people with Covid-status certificates can lead to a minority of the unvaccinated population deliberately exposing themselves to a Covid-19 infection in order to obtain a certificate. In addition, the obligation to show Covid-status certification in the workplace may boost the vaccination uptake somewhat.

This paper contributes to the limited evidence on the potential impact of introducing the 3G rule. To our knowledge, our study is the first to use a consistent empirical framework to estimate the effects on workers' sick leave. Specifically, we examine whether employees circumvent the obligation to prove their status by taking sick leave. We identify such a “3G effect” by exploiting the substantial differences between the vaccination rates of Germany's federal states (see Figure 1). The more unvaccinated people there are in a state, the more strongly the sickness absence rate should react if a 3G effect exists. For an empirical analysis we combine health insurance data with epidemiological data for the German federal states. Our findings do, in fact, indicate that the 3G rule led to additional days of sick leave of a relevant magnitude.

**Figure 1: Vaccination rates of those with basic immunisation aged 18 to 59 by federal state as percentages**

on the reporting dates 30/09/2021 and 31/01/2022



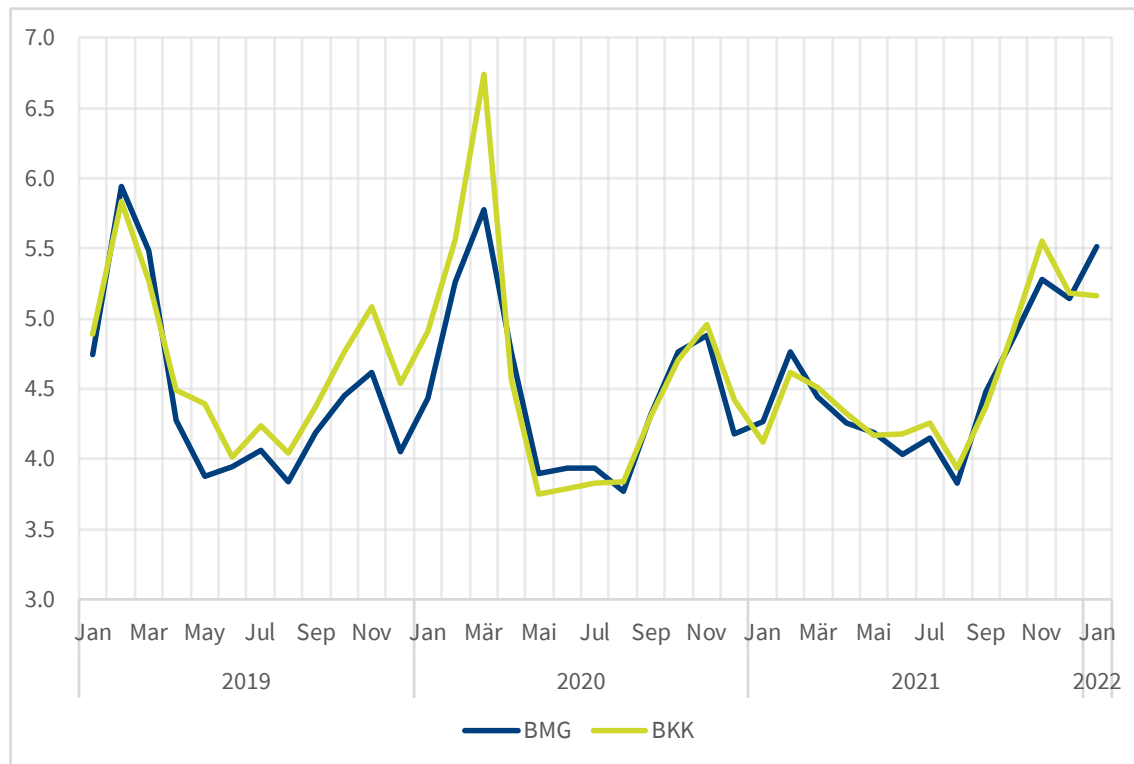
## 2 Data

Our analysis is based on a combination of three data sources. The epidemiological data come from the Robert Koch Institute (RKI), which combines into statistics the laboratory-confirmed Covid-19 infections reported to the local public health authorities. We utilise the Covid-19 infection rates in the 15-59 age group in relation to the corresponding population group (RKI 2022a). Furthermore, the vaccination rates of people with basic immunisation in the 18-59 age group, in other words those who have received two jabs, are included in the estimate (RKI 2022b, Figure 1). These data, too, are compiled by the RKI from the vaccination data reported by the service providers (vaccination centres, mobile teams, doctors etc.) and published in corresponding statistics.

In addition, we use data from health insurance providers on sickness absence rates in Germany. These data are based on analyses of days of sick leave of some four million employees who have statutory health insurance from a company health insurance fund (Betriebskrankenkassen) (BKK 2022). In Germany, employees are entitled to full continued payment of wages by their employer for a maximum of six weeks in the case of sickness. The sickness absence rate is calculated on the basis of the days of sick leave reported and indicates the percentage of calendar days in the observation period on which each employee was unable to work on average due to sickness. Furthermore, the average number of days of sick leave is also available by major diagnostic

category according to the International Statistical Classification of Diseases and Related Health Problems (ICD). The course of the sickness absence rate based on the BKK largely corresponds to that of all statutory health insurance funds in Germany (see Figure 2); the structure of the BKK members does not differ substantially from that of the entire workforce either.

**Figure 2: Monthly sick leave of employed health insurance members as percentages over time**  
January 2019 to January 2022



Note: Deviations in the sickness absence rate may also be due to the different recording of the two statistics. The sickness absence rate on the basis of all statutory health insurance funds is calculated based on monthly average values from information on the cut-off dates on the first of the month (IAB 2022b). The sickness absence rate of BKK employees corresponds to the days of incapacity to work in the entire reporting month (BKK 2022).

Source: IAB 2022b, BKK 2022

The estimate is conducted using monthly data at federal-state level from September 2021 onwards. Information regarding the vaccination rates is available from this time onwards. Furthermore, from September onwards the infections were almost entirely dominated by the delta variant. The sample ends in January 2022. In Germany, the 3G rule in the workplace came into force on 24 November 2021 and thus relates mainly to December and January in these data. As of 19 March 2022 the 3G rules in the workplace were relaxed again; since then establishments have been allowed to make their own decisions about protective measures.

The Covid effect on the sickness absence rate is indeed stronger in federal states with lower vaccination rates. A 3G effect (in other words an evasion effect) cannot simply be inferred from this observation, however. It is also obvious that the sickness absence rate will be higher when the vaccination rate is low because more infections then occur and because Covid-19 is more



serious in unvaccinated people (although vaccination side effects could also increase the sickness absence rate).

### 3 Empirical analysis

We consider this kind of correlation in a regional panel data analysis and utilise the considerable differences between the vaccination rates in the federal states. The more unvaccinated people there are in a federal state, the more strongly the sickness absence rate should respond if there is a 3G effect.

The sickness absence rate serves as the dependent variable. We use federal-state fixed effects to control for general characteristics of the states (such as the sector composition of homeworking potential). Time fixed effects take into account month-specific features, such as seasonal effects. Furthermore, we control for the Covid-19 infection rate to take into account differences in the infection burden. This would also measure whether more infections were recorded due to the test obligation involved in 3G than had previously been the case. Additionally, the Covid-19 infection rate is interacted with the vaccination rate, as infections can be more serious for unvaccinated people and may accordingly lead to more sick leave. The base effect of the vaccination rate is also taken into account. This would also capture cases of sick leave resulting from vaccination side effects. Finally, the vaccination rate is interacted with a 3G dummy (December/January dummy). This interaction measures the strength of the post-treatment effect due to the introduction of 3G. The panel model is shown in equation (1):

$$sick_{it} = c_1 + c_2 inc_{it} + c_3 inc_{it} \times vac_{it} c_{32} + c_4 vac_{it} + c_5 vac_{it} \times 3G_t + \mu_i + \gamma_t + \varepsilon_{it} \quad (1)$$

where  $c$  are the coefficients,  $sick$  the sickness absence rate,  $inc$  the COVID-19 incidence,  $vac$  the vaccination rate,  $3G$  the December/January dummy,  $\mu_i$  the regional fixed effects,  $\gamma_t$  the time fixed effects and  $\varepsilon_{it}$  the error terms. The index for the states is denoted by  $i=1,...,16$  and the time index by  $t=1,...,5$ .

A 3G effect can be assumed to exist if the vaccination rate of those individuals with basic immunisation in December and January has a negative effect on the sickness absence rate exceeding that of the previous months. This procedure can be seen as a type of a difference-in-difference approach with December 2021 as the treatment date. We use a special application of this approach by replacing the binary treatment by the “bite”, i.e. different vaccination rates. We borrow this procedure from the literature that measures the effects of a nationwide minimum wage on employment; see, for instance, Card (1992) or recent applications in Bauer/Weber (2021) and Caliendo et al. (2018).

Table 1 shows the estimation results. A higher Covid infection rate increases the sickness absence rate, as expected. The vaccination rate has only a statistically insignificant negative effect, which may be due to side effects (Ziemann/Görg 2021); also note that a reduction of infections due to the vaccination is already controlled by the Covid infection rate variable. What is decisive for our research question is the interaction term of the vaccination rate and the 3G dummy, whose effect is estimated to be statistically highly significant, at -0.021. This means that

a one-percentage-point lower vaccination rate led to an increase in the sickness absence rate by 0.021 percentage points when the 3G rule came into force.

**Table 1: Panel regression results for regional sickness absence rate**

constant	infection rate	infection rate x vaccination rate	vaccination rate	vaccination rate x 3G
6.281 (2.83)	0.269 (3.63)	0.001 (0.06)	-0.007 (-0.23)	-0.021 (-8.67)

t-values in parentheses (White period cluster)

Source: own calculations

To illustrate the significance of the estimation results, we consider counterfactual scenarios. If the vaccination rates of the eight states with the lowest values had equalled the average of the eight with the highest values, the sickness absence rate in December would hypothetically have been 0.07 percentage points lower due to this effect. If the vaccination rate of all the federal states had equalled the average of the top three states, the sickness absence rate would hypothetically have been 0.23 percentage points lower due to this effect. In 2020 the costs of a day of sick leave in terms of lost production were estimated at 124 euros per employee (BAuA 2020). An extrapolation of this would result in production loss costs of between 78.3 and 257.3 million euros per day due to the higher sickness absence rate.

No indication of autocorrelation is found in the residuals. A lagged endogenous variable also plays no significant role in a GMM estimate (Arellano/Bover 1995).

Although effects such as regional Covid infection rates and vaccinations were controlled for, it cannot be entirely ruled out that the estimate of the 3G effect may be skewed by a factor that was not considered but may have simultaneously altered the effect of the vaccination rate. This does not appear to be the case, however. A rule that unvaccinated employees would lose their entitlement to compensation for loss of earnings in accordance with the Infection Protection Act if they had to go into quarantine also came into effect on 1.11.2021 (Sagan/Schüller 2020). This, too, may have been circumvented by means of sick leave. We therefore conduct a robustness check using an additional dummy from November onwards interacted with the vaccination rate. However, this turned out to be statistically insignificant (the effect thus remains with the 3G dummy from December onwards). This insignificance of a pre-treatment indicator also provides evidence supporting the common trends assumption. Especially from December onwards there was a clear increase in the uptake of booster vaccinations, which had a stronger impact on states whose vaccination rates were already high (double jab). As a robustness check we additionally incorporate into the model the booster rate, the booster rate interacted with the Covid infection rate and the booster rate interacted with the 3G dummy. The 3G effect measured then increases slightly from -0.021 to -0.025.

In order to ease the burden on doctors' surgeries and reduce the spread of the virus, the usual method of obtaining a sick note was relaxed temporarily during the pandemic: in the period from November 2021 to March 2022 it was possible to get a sick note for respiratory illness without visiting the doctor in person; instead, a doctor was also able to write a sick note for up to 14 days following a telephone consultation. It is conceivable that this procedure in particular may have been used to circumvent the 3G rule. The number of days of sick leave due to respiratory illnesses

in December 2021 was approximately one third higher than was usual at that time of the year before the pandemic. Obviously, this is not necessarily due to a 3G effect, either. For this reason, we also conduct our panel analysis using days of sick leave according to major diagnostic category. The BKK data on the days of sick leave per 100 employees permit a differentiation into eight different ICD diagnostic categories. It emerges that the 3G effect only appears in the “respiratory system” category. This suggests that the telephone consultation for respiratory illnesses may have been a method method for attempting to circumvent the 3G rule.

## 4 Conclusion

We combine health insurance data and epidemiological data to analyse the impact of the obligation for employees to prove their Covid status in the workplace on the sickness absence rate. The results of our empirical panel analysis imply that obligations like the 3G rule in the workplace lead to evasion responses. The 3G effect measured does not necessarily imply a violation of duties. It is possible that these were real illnesses, but that a sick note would not have been obtained without the 3G rule. It is important, however, to consider evasion responses when introducing controversial obligations and to design the rules appropriately and communicate them convincingly.

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### **Corresponding author**

Enzo Weber

Phone: +49 911 179-7643

Email: [Enzo.Weber@iab.de](mailto:Enzo.Weber@iab.de)