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ANALYSES AND STUDIES

Increased Digitalisation as a Result of the Coronavirus?

Results of two bidt short surveys:
The prevalence and practice of home office in Germany

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The Bavarian Research Institute for Digital Transformation (bidt) contributes—in its capacity as an institute of the Bavarian Academy of Sciences and Humanities (BAdW)—to a better understanding of the developments and challenges of digital transformation. In so doing, it provides the foundations upon which society's digital future can be shaped responsibly for the common good.

The bidt Think Tank seeks to present an independent, fact-based impression of the status of digital transformation. It also provides suggestions and recommendations for decisions that are evidence based and will ultimately shape successful digital change. To this end, the Think Tank team observes, documents and analyses current developments using empirical methods.

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Abstract

This study provides insights into the prevalence and practice of home office in Germany in the wake of the coronavirus pandemic. Central to this, the Bavarian Research Institute for Digital Transformation (bidt) conducted two short online surveys at the end of March 2020 and in mid-June 2020. Each one collected around 1,500 responses from working adult Internet users. The results show how often respondents worked from home before and during the coronavirus crisis as well as the reasons given for not having worked in home office before. Also investigated was how well employers were prepared for the increase in home office working, and whether there were any difficulties associated with the technology required to work from home. Other questions captured the satisfaction levels of people working from home, as well as their desire to do so more often and their estimation of how opportunities to work from home might develop once the pandemic was over.

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1 Overview

Digitalisation is a prerequisite for building the workplace of the future. It is an essential enabler of flexible work models and forms of telecommuting such as home office. During the coronavirus pandemic, this topic became the focus of huge public debate and increased relevance. Over the course of the crisis, the Bavarian Research Institute for Digital Transformation (bidt) investigated the prevalence and practice of home office. To this end, the bidt carried out two short representative surveys, each among around 1,500 working adult Internet users in Germany. The first survey took place from 27 to 29 March 2020 and the second from 12 to 15 June 2020. The surveys were conducted using Google Surveys. The results show that:

The use of home office increased during the crisis. Before the pandemic, 35% of working adult Internet users in Germany used home office at least occasionally. The number of women in home office was slightly lower than that of men. At the end of March, 43% of respondents worked from home at least occasionally, compared to 40% in mid-June. However, even during the coronavirus pandemic, the majority of people did not work from home.

The intensity of home office use increased considerably during the crisis. In mid-June, 32% of working adult Internet users still worked from home several times a week. At the end of March, this group made up 39% of responses. Before the crisis, however, only 20% of respondents were in home office several times a week.

Many employers did not allow the use of home office before the pandemic. 39% of those in March who were in home office for the first time were working for employers who had previously not allowed them to work from home. 26% said that previously they had not wanted to work from home.

The level of reported satisfaction with the current situation in home office is high. In both surveys, more than 80% of working adult Internet users said they were satisfied with their home office situation. However, the satisfaction levels vary somewhat from group to group. The group with the lowest number of satisfied members comprised those who were working from home for the first time at the beginning of the crisis, at the end of March (75%). The most satisfied group, overall, comprised men living in a household with a child or children at the end of June (92%).

There appears to be a strong overall desire to spend more time in home office. Around 70% of employees surveyed who consider home office to be possible in their job would like to be able to work from home more often than they did before the pandemic.

There is widespread fear that employers will once again restrict permission to work from home once the pandemic is over. 55% of employees surveyed assume that opportunities to work from home will return to pre-crisis levels after the coronavirus crisis.

The study suggests that employers and employees should regard the move to home office during the pandemic as an opportunity. Both parties should now negotiate the long-term application of more flexible work models. A system that combines the advantages of working from home with the benefits of working in the office seems to be a worthwhile goal. At the same time, it will be important to counteract possible negative effects of working from home. Following the initial surge brought on by the coronavirus crisis, it remains to be seen whether providing a legal right to work from home will be deemed necessary. Whatever happens, it would certainly be counterproductive to an already delicate economic recovery to implement new, heavily bureaucratic regulations concerning home office.

An increase in flexibility across the working world will have a knock-on effect on countless other areas. These include effects on the environment, cityscape and social factors, not to mention demand for business travel or commercial office space. To this end, it is vital to start research early and begin to tackle some of the questions that arise head on.

2 Introduction

As the world becomes increasingly digital, the downstream effects of this revolution become visible in more and more areas of life. In the working world, access to and familiarity with digital devices form the foundation for mobile working models including home office or telecommuting.[1] In Germany, the subject of home office—described as a flexible work model across different locations in which tasks are partly performed from home (Weichbrodt/Schulze 2020, 93)—has become the focus of growing political debate in recent years. The SPD, in particular, has called for a legal right to home office (SPD-Fraktion im Bundestag 2019; Spiegel Online 2019). One advantage of working in home office is the ability to better balance work and family responsibilities, mainly through flexibility and time saved by not having to commute to work. Further benefits include higher job satisfaction and increased positivity, mainly due to a perceived increase in autonomy, fewer interruptions and higher productivity (Gajendran/ Harrison 2007; Bloom et al. 2015; Messenger 2017; Weichbrodt/Schulze 2020). However, negative effects are also possible, including psychological and other health issues that result from increased stress, longer working hours and a blurring of the boundaries between work and private life (Bloom et al. 2015; Messenger 2017; Song/Gao 2018; Waltersbacher et al. 2019). A diminished feeling of teamwork and a lack of informal exchange are possible other disadvantages of working in home office (Weichbrodt/Schulze 2020).

A European comparison shows that far fewer Germans worked in home office before the pandemic than in Scandinavian or other Western European countries. Because of a long-established culture of office presence in German companies, the potential of home office has not been exhausted by far (Brenke 2016; see Box on page 10–12 ‘Germany and home office before the coronavirus pandemic’).

However, the pandemic itself and the steps local and national authorities have taken to restrict the transmission of the coronavirus have had a far-reaching impact on mobile working. With many work processes going increasingly digital, it is possible to maintain communication with colleagues while working from home. This naturally means that direct contact is avoided, and further infections are reduced. To get a clearer picture of the effects of the coronavirus pandemic on the prevalence of home office, the Bavarian Research Institute for Digital Transformation (bidt) conducted two short online surveys of working adult Internet users in Germany, in March and June 2020. The surveys focused on how the pandemic was affecting the intensity of home office use, as well as reasons for choosing not to adopt such a model before the coronavirus crisis. Also investigated was how well employers were prepared for the extension of home office working, and whether there were any difficulties associated with the technology required to work from home. Other questions captured the satisfaction levels of people working from home, as well as their desire to do so more often and their estimation of how opportunities to work from home might develop once the pandemic was over.

The results show that particularly the intensity of home office use has increased during the pandemic, and that satisfaction with the situation in home office is high. Corresponding to this, a clear majority of employees would like to see working in home office become more common after the pandemic than it was before.

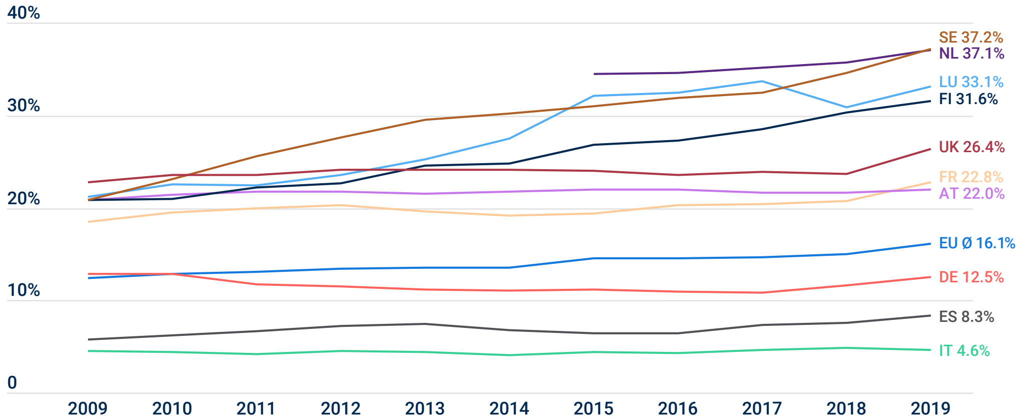
Employers and employees should view this current situation, defined by an increase in home office, as an opportunity. They should now enter into negotiations to determine the long-term application of flexible models of work. These new work structures should combine the benefits of home office with the advantages of working on site. It remains to be seen whether providing employees with a legal right to work from home will be deemed necessary after the surge in home office work brought on by the coronavirus pandemic. Certainly, however, economic recovery should not be hampered by new, highly bureaucratic regulations.

The following sections describe the method of the study as well as the data collected and the results of data analysis. A summary of the main findings has been provided at the end including implications for the future. Potential avenues for further research have also been proposed.

Germany and home office before the coronavirus pandemic

Compared to other European countries, Germany is not a leader when it comes to working from home. In 2019, the proportion of working people in Germany working from home at least occasionally was around 13% (see Figure 1.1). This proportion is lower than the average of the 28 EU Member States, which is around 16%. Since 2009, there has been virtually no change in the proportion of home office use in Germany, while the EU average has grown by around four percentage points over the same period. In 2019, Sweden, the Netherlands, Luxembourg and Finland were leading in terms of the proportion of working people using home office at least occasionally. In these countries, around a third of working people used home office at least some of the time. Moreover, in all four countries—in contrast to Germany—there is a clear increase in this proportion compared with 2009. This is also the case in the United Kingdom and France, where the proportion of home office users increased to around 26% and 23%, respectively, by 2019. In 2019, Spain was behind Germany with around 8%, as was Italy with around 5% (Eurostat 2020).

Use of home office in Europe 'usually' and 'sometimes'



Source: Eurostat 2020.
Breaks in time series for Luxemburg 2009 and 2015, Germany 2010–2012, France 2014 and Sweden 2018.
Data for 'sometimes' in the Netherlands only available from 2015.

Figure 1.1: Use of home office in Europe

The results of the LPP Employee Survey 2017, commissioned by the Federal Ministry of Labour and Social Affairs and the Institute for Employment Research among larger companies, show that the proportion of those working from home occasionally was highest in Sales and Marketing, followed by Service and Administration. In Manufacturing, however, the proportion is relatively low (see Figure 1.2). The numbers also indicate that there was a higher proportion of people working from home among those with management responsibilities than among those without (Grunau et al. 2019, 3).

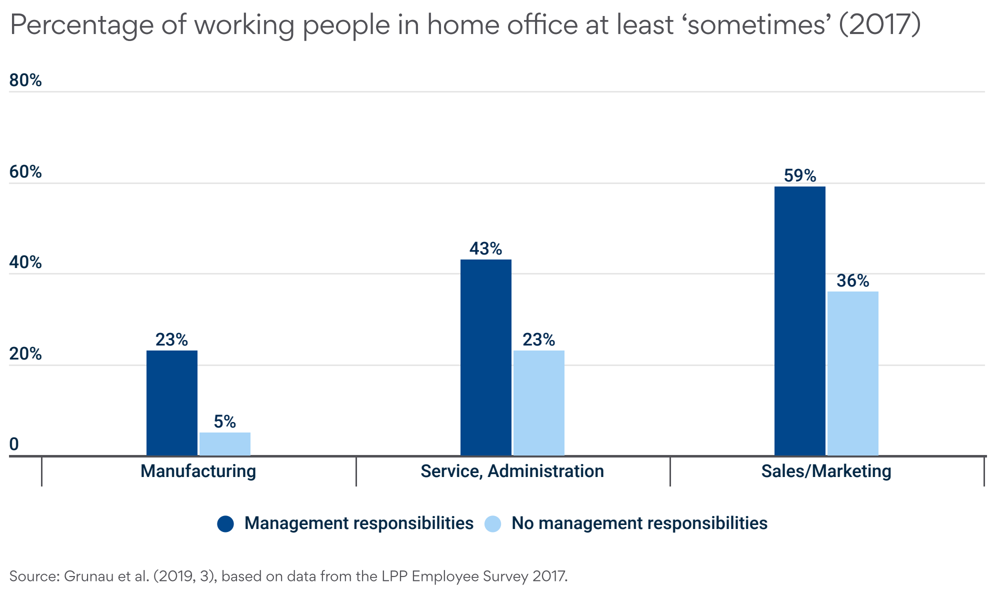
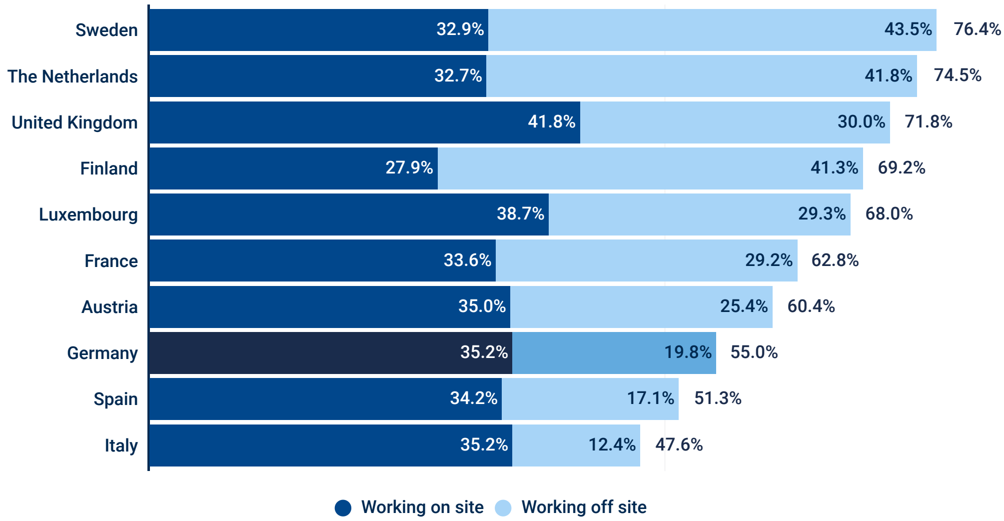


Figure 1.2: Percentage of working people who worked from home at least 'sometimes', by field of activity

This also reflects the fact that not all activities can be performed in home office. Manufacturing employees must be on site in the factory, sales staff on site in the shop and nurses on site in the hospital (see Mergener 2020). For this reason, it makes sense to compare working people whose work can, at least potentially, be performed off site using information and communication technology. Looking at occupational groups that spend at least a quarter of their working time on a PC, laptop or smartphone, Germany is still only in the middle range compared to other European nations (see Figure 1.3). On the one hand, countries such as the Netherlands, Sweden and Finland have a much larger proportion of these so-called 'computer workers' than Germany. On the other, a disproportionately large number of these types of workers in these countries work off site several times a month. In Germany, around a third of 'computer workers' occasionally worked from outside the workplace. This proportion was similar in Spain. Italy came last with 26% (Hammermann/Stettes 2017, 8).

‘Computer workers’ working on and off site (2015)



Source: Hammermann/Stettes (2017, 8), based on data from the European Working Conditions Survey 2015.

Figure 1.3: Percentage of ‘computer workers’ working on and off site in proportion to all working people in the respective country (2015)

Using data from the ‘Socio-Economic Panel’ (SOEP), Brenke (2016, 99–101) shows that around 42% of all dependent employees in Germany believe that it would be possible for them to work from home, in principle. However, only around 12% of jobs actually involve home office use. The higher the qualification requirements of those working, the more likely it is that the job can be performed in home office. The main reason given for why home office was not used where it might have been possible in principle was the fact that the employer had not presented the opportunity to do so. Alipour et al. (2020) come to a slightly higher value. They analysed data from the BIBB/BAuA Employment Survey 2018 and concluded that it would be possible for 56% of all jobs to involve home office use.

3 Data

The data for this study was collected by the Bavarian Research Institute for Digital Transformation (bidt) using Google Surveys in two waves: at the end of March 2020 (shortly after the nationwide restrictions came into effect in Germany) and mid-June 2020 (after a phase of gradual relaxation of restrictions).[2]

Google Surveys uses its large network of web publisher sites where the surveys are displayed to Internet users.[3] The questions appear in the form of a so-called surveywall, where visitors only gain access to further content after answering some questions. Google Surveys, in turn, pays publishers for each survey answered on their sites. In each of the two surveys, over 80% of the websites where the questionnaires were posted were in the category 'News', the remaining categories were 'Other' or 'Arts & Entertainment'. Google Surveys stratified the sample during the field phase of the survey. This means that under-represented groups in terms of region, age, and gender were more likely to receive the questionnaire, while over-represented groups were less likely to receive it (Google 2018). An additional weighting of the data at a later stage ensures that the results are representative of adult Internet users in Germany as a whole.

Originally, Google Surveys collected 2,507 complete responses for the first survey at the end of March and 2,502 complete responses for the second survey in mid-June. A data check and data cleansing exercise mainly excluded respondents who had answered unusually fast or inconsistently (about 10% each). Furthermore, only working respondents were considered for the evaluations described below. After all adjustments, 1,579 and 1,478 complete responses were available in the data sets of the two surveys.[4] Table 1 provides an overview of the key figures from both survey waves. All analyses presented in the following results section are weighted.[5]

	SURVEY WAVE 1 (MARCH)	SURVEY WAVE 2 (JUNE)
Field time	27 to 29 March 2020	12 to 15 June 2020
Original number of responses	2,507	2,502
Number of responses after data cleansing	2,003	2,003
Number of responses for analysis (working people only)	1,579	1,478
Weights	0.6 to 3.5	0.5 to 3.8

Table 1: Key figures for survey waves 1 and 2

4 Results

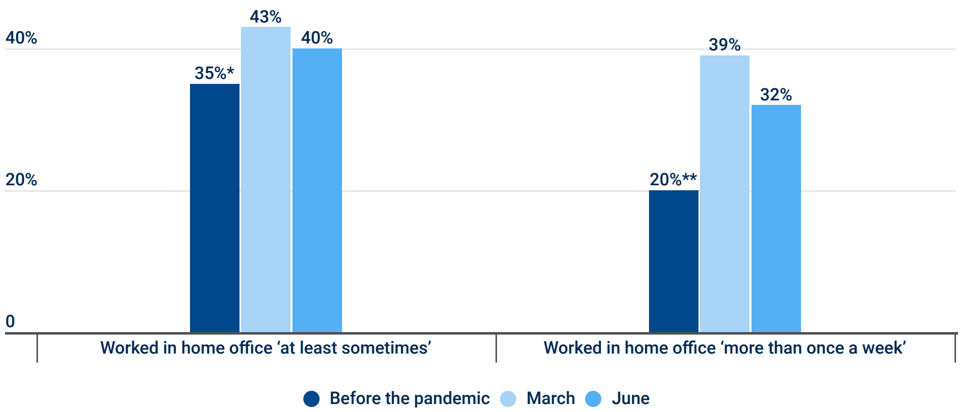
The most important results are presented in the following section. These are derived from the answers to the ten questions asked in each survey wave.[6] Some more detailed results of the analysis can be found in the tables in the appendix.

4.1 Prevalence of home office before and during the pandemic

Before the pandemic, the proportion of working Internet users in Germany who worked in home office at least occasionally was 35%. This is a larger proportion than that indicated in the official Eurostat (2020) statistics for Germany in 2019. It is fair to assume that people who participate in online surveys are more likely to work in home office compared to people who are less experienced in using the Internet (see also Box on page 23–24 'Empirical findings on home office during the coronavirus pandemic'). As expected, home office use has increased since the beginning of the pandemic. At the end of March, 43% of respondents were working at least occasionally from home, eight percentage points more than before the pandemic. At the second survey point in mid-June, this number had dropped slightly to 40%, as can be seen in Figure 1.

Download Data →

Working Internet users in home office



Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in March and June 2020.
* Data from the survey in March (N = 1,579)
** Data from the survey in June (N = 1,478)

Figure 1: Home office use before and during the coronavirus pandemic (weighted)

However, the intensity of home office use increased considerably. The proportion of people who worked in home office several times a week increased from 20% before the pandemic to almost 40% in March. Although this figure fell again in mid-June, almost a third of working

Internet users were still in home office several times a week. Around 20% were still almost exclusively working from home. At the end of March, this proportion was 26%.

Of those who did not work from home before the pandemic, the vast majority (76%) were still not working in home office at the end of March. 16% of these were now working from home for the first time. 8% of respondents with no previous home office experience said they were released from work due to the pandemic (see Table A.1 in appendix).

Additionally, results show that, before the pandemic, women were less likely than men to work at least occasionally from home (32% compared to 38%). Interestingly, the overall decline in home office use from the end of March to mid-June is exclusively attributed to male respondents. The proportion of female respondents working from home at least occasionally did not change during the pandemic and remained above 40%. In terms of intensity of home office work, however, there was no difference between men and women before the crisis. Around a fifth of both groups worked in home office several times a week. In the March survey, this proportion rose to almost 40% for both genders. However, the decline in June is less pronounced for women (only minus four percentage points) than for men (minus nine percentage points). In mid-June, 29% of male and 35% of female respondents were still working from home several times a week.

Download Data →

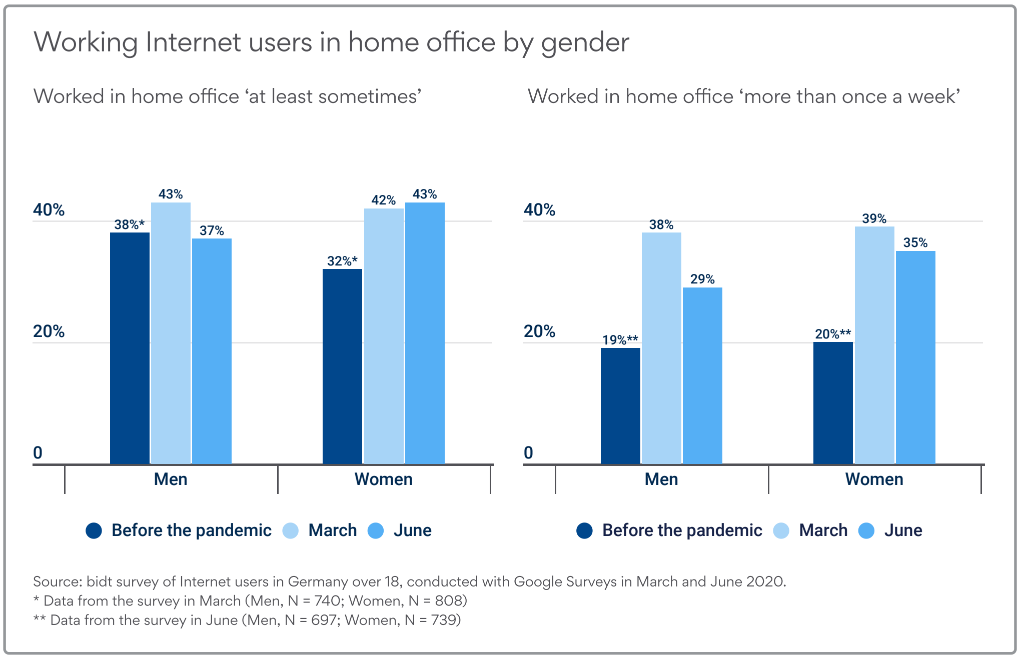


Figure 2: Home office use before and during the coronavirus pandemic by gender (weighted)

The numbers show that even during the pandemic, a majority of working Internet users in Germany were not working in home office. At the same time, the overwhelming majority of those who worked from home during the pandemic had already worked in home office before. For them, home office was nothing new—the only difference was that they were now working from home more often.

4.2 Reasons against home office

The various reasons given by working Internet users for not working from home before the pandemic were revealed by the data collected in the first survey wave, at the end of March. These responses make it clear why only a slight increase of only eight percentage points occurred in the use of home office. It is demonstrated that 80% of respondents who did not work from home before and during the pandemic said that home office was generally not possible in their job. 9% of respondents who did not work in home office before and during the pandemic said that, prior to the crisis, their employer had not allowed it. A lack of technical equipment, unwillingness to work in home office, a slow Internet connection or none at all were only minor factors for these respondents.

A different picture emerges for home office newcomers—i.e. working people who used home office for the first time during the pandemic. For almost 40% of them, one reason for not using home office before the crisis was that their employer had not allowed it. 26% preferred to work on site only and 23% said that working in home office was generally not possible in their job. A lack of technical equipment provided by the employer was cited by 11% of home office newcomers as a reason why they did not work from home before the pandemic. For them, too, the quality of Internet connection played only a minor role.

Download Data →

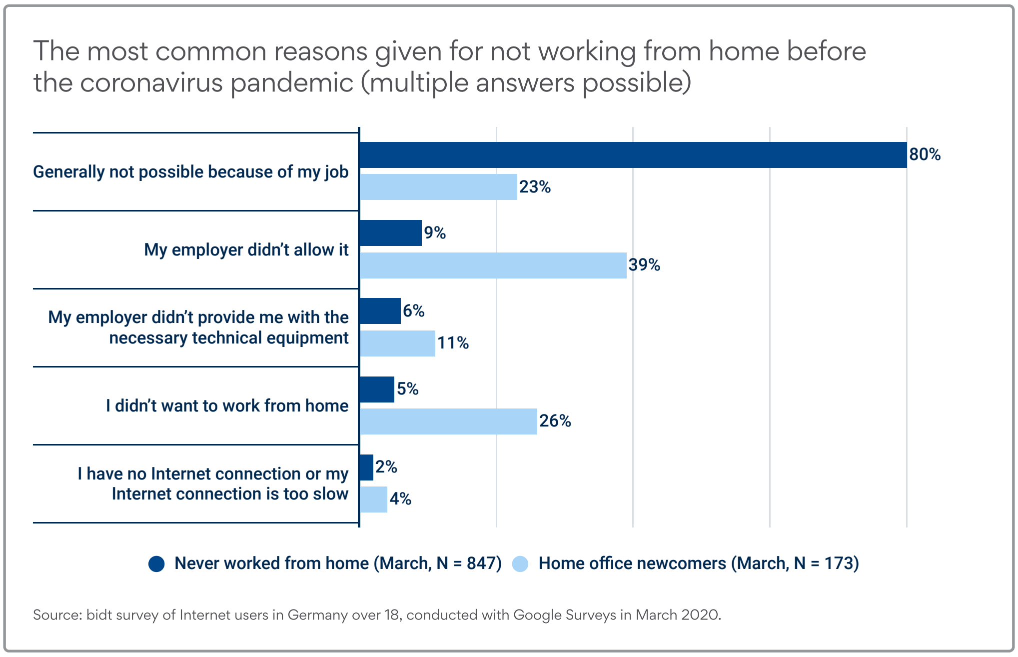


Figure 3: Reasons for not working in home office before the coronavirus pandemic (weighted)

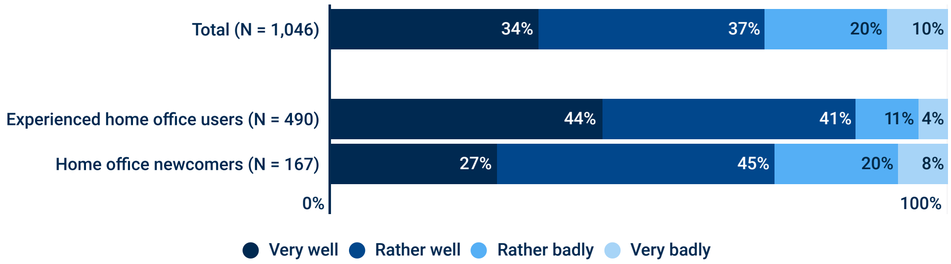
Thus, a comparison of working Internet users not using home office at all and home office newcomers shows that the pandemic has led to a change where working from home was possible in principle. Employers had to change their attitude towards home office and allow it. And employees had no choice but to work in home office even though they might not have wanted to. It should be emphasised that the pandemic has led to some people working from home who, due to their jobs, did not previously consider home office to be possible.

4.3 How well prepared were employers?

The majority (71%) of employees who did work from home believe their employer was well prepared for the extension of home office, if such an extension was implemented. Differences again become apparent when comparing the assessments of employees who worked from home before the pandemic with those who did not. For example, 85% of employees who had already worked from home rated their employer as 'very well' or 'rather well' prepared for the extension of home office, only 15% as 'rather badly' or 'very badly' prepared. Among home office newcomers, these figures were 72% compared to 28%. It should be noted that this positive overall impression may be due to the fact that in many companies extending opportunities to work from home, home office was not an entirely new thing. Employers who did not introduce or extend home office and who may therefore have been less well prepared were not targeted by the question.

Download Data →

'If your employer extended the opportunity to work from home to staff during the pandemic: how well prepared do you think your employer was for this situation?'



All employees whose employers extended home office, March 2020.

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in March 2020.
Percentages may not add up to 100 due to rounding.

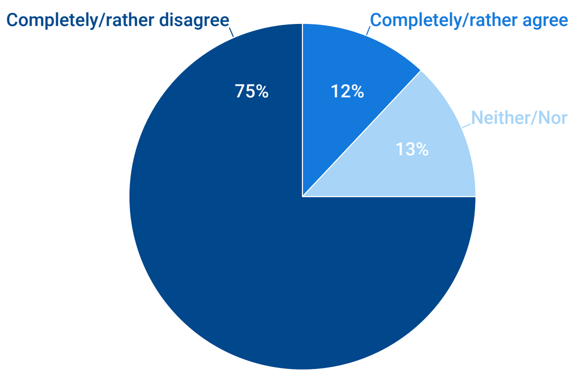
Figure 4: Employer preparedness for the extension of home office (weighted)

4.4 Technical difficulties

Three quarters of working Internet users stated in the survey in mid-June that they had no major difficulties with the technology they used in home office. Only 12% reported major difficulties. This may be due to the fact that home office was not a completely new experience for many. However, even among those who worked from home for the first time during the pandemic, a similarly high proportion said they had no problems with the technology they used. These responses do not differ significantly by age group either (see Table A.2 in appendix).

Download Data →

'I have serious difficulties using the technology required for working from home.'



All working people who used home office before and/or during the pandemic (June, N = 629).

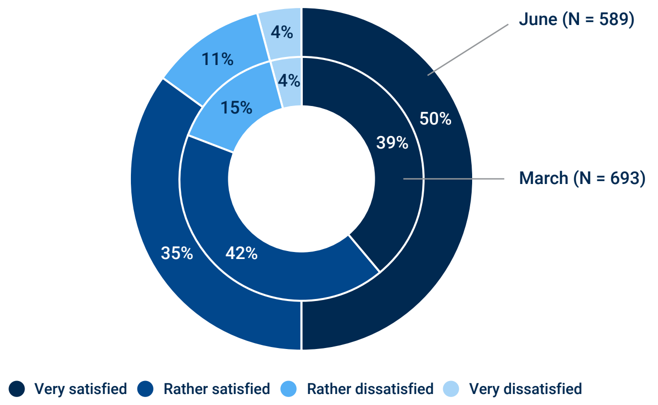
Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in June 2020.

Figure 5: Technical difficulties in home office (weighted)

4.5 Satisfaction with the home office situation

Satisfaction levels among working people in home office during the coronavirus crisis are generally high. At the beginning of the pandemic in late March, 81% said they were 'very satisfied' or 'rather satisfied' with their home office situation. After ten weeks of more or less intensive home office work, this proportion rose even further. In mid-June, 85% of all those working in home office said they were 'very satisfied' or 'rather satisfied'. The increase in the proportion of 'very satisfied' people from 39% in March to 50% in June is particularly striking. Furthermore, especially among older respondents aged 55 and over and among women, the percentage of satisfied respondents increased over time. At the time of both surveys, the proportion of satisfied working Internet users who had used home office at least sometimes before the crisis was higher than among home office newcomers.

'How satisfied are you with your own home office situation?'



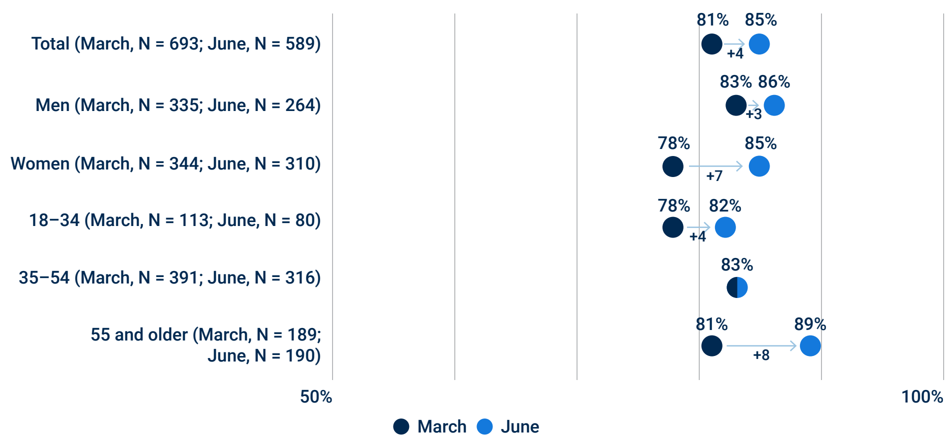
All working people in home office at the time of the survey.

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in March and June 2020.

Download Data →

Figure 6: Satisfaction with working in home office (weighted)

Increase in satisfaction levels during the pandemic



All working people in home office at the time of the survey.

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in March and June 2020.

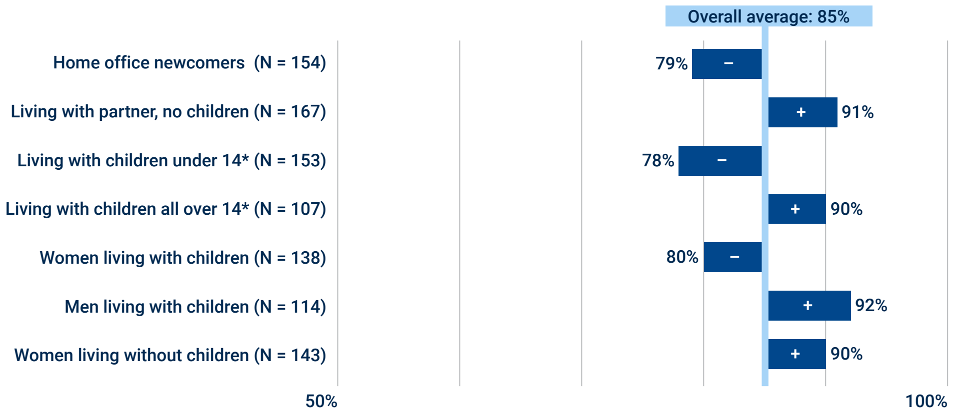
Download Data →

Figure 7: Changes in satisfaction with home office situation by age and gender (weighted)

Despite this consistently high proportion of satisfied people, there are some deviations from the average value for different population groups. For example, women with children are slightly below the average in June[7] of 85% with 80% being satisfied. Women without children, on the other hand, are above average, with 90%. This means they belong to the groups with the highest proportion of satisfied respondents, which also include the following: men with children; people living with a partner without children and people living in a household with children who are all 14 or older. In contrast, respondents in households with children under 14 report only a 78% satisfaction rate, which is the lowest value of all the groups considered in mid-June. 79% of home office newcomers were satisfied in June; in March this figure was 75%, which was the lowest overall proportion of all the groups surveyed. Nevertheless, the vast majority of these respondents are also 'rather satisfied' or 'very satisfied' (see Table A.3 and Table A.4 in appendix).

Download Data →

'How satisfied are you with your own home office situation?'



All working people in home office at the time of the survey, June.

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in June 2020.

* This includes people living with and without a partner, because of low cell frequencies.

Figure 8: Satisfaction by selected groups (weighted)

4.6 Desire for more home office

The high overall level of satisfaction and the low level of technical difficulties reported are reflected in the widespread desire for more home office opportunities. About 70% of those employees who consider home office to be possible in principle in their job would like their employer to create more opportunities for this after the pandemic than was the case before the crisis. Only about one third do not wish to see an extension of home office after the pandemic. The values in the two survey waves in late March and mid-June are almost identical. The desire is somewhat more prevalent among female than male employees (see Table A.5 in appendix).

Download Data →

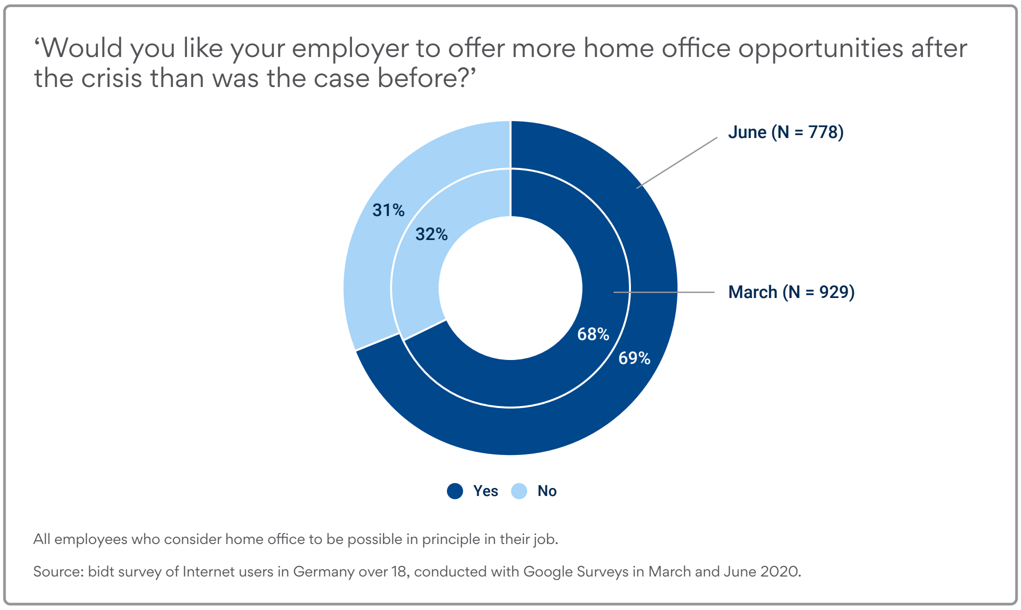


Figure 9: Desire for increase in home office opportunities (weighted)

4.7 Expectations for home office opportunities after the pandemic

A further question was whether employees believe that the widespread desire for more home office after the pandemic will be taken into account by their employers. Many respondents doubt, however, whether the current opportunities regarding home office—forced on employers due to the crisis—will be continued in the future. 55% of those surveyed assumed that after the pandemic, their employer would reduce home office back to its pre-crisis level. This belief is more common among female (59%) than male employees (48%).

Download Data →

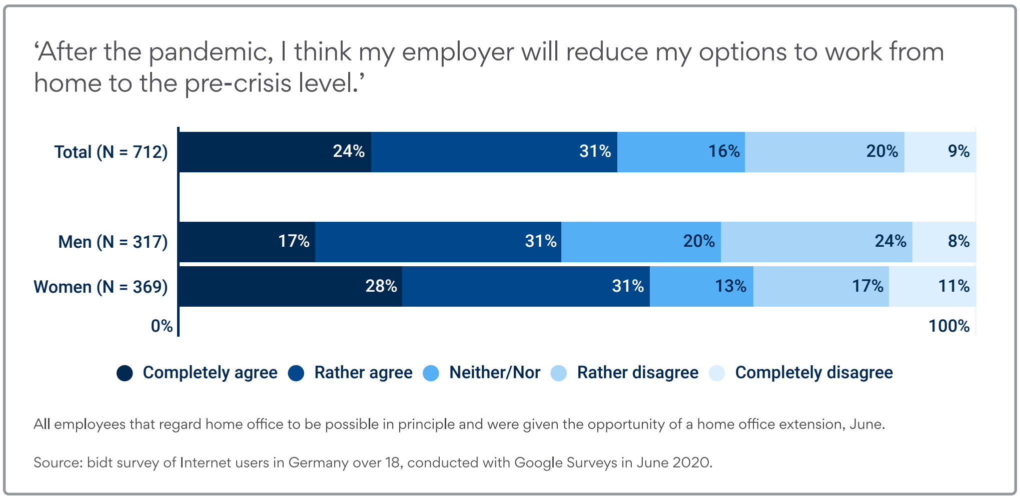


Figure 10: Prediction for home office after the pandemic (weighted)

5 Summary and outlook

To get a clearer picture of the effects of the coronavirus on the prevalence of home office use, the Bavarian Research Institute for Digital Transformation (bidt) conducted two short online surveys of working adult Internet users at the end of March and in mid-June 2020. The answers collected show that the proportion of those who worked from home at least sometimes has increased somewhat as a result of the pandemic, but that the majority of working Internet users are still not in home office at all. Fewer women than men worked from home before the pandemic. However, at the beginning of the pandemic, in late March, the number of women working in home office increased to match the proportion of men. A major increase can be shown in the frequency of home office use. At the beginning of the pandemic, the proportion of those who worked from home several times a week almost doubled compared to the pre-crisis level.

For working Internet users who did not work from home both before and during the pandemic, the main obstacle was the nature of the job itself: The vast majority of these respondents believe that home office is not possible in their line of work. Among home office newcomers in the crisis, the most commonly cited reason for not working from home prior to the pandemic was that home office was not allowed by their employer. The second most common reason was that respondents did not want to take the opportunity to work from home. Especially in areas of work where home office is considered possible in principle, the coronavirus has led to change by accelerating the introduction and use of home office.

In general, there is a high level of satisfaction among home office users. However, the percentage of satisfied people varies depending on the group of people considered. At 75%, satisfaction was lowest among home office newcomers at the beginning of the crisis in late March, and highest among men living in a household with a child or children at the end of June, at 92%. This consistently high level of satisfaction is also reflected in the desire for more home office after the pandemic. Around two thirds of employees want to work from home more often than they did before the crisis. At the same time, however, a majority of all employees (55%) also fear that home office opportunities after the pandemic could be reduced to pre-crisis levels.

The results of the survey are essentially in line with similar empirical studies conducted during the pandemic (see Box on page 23–24 'Empirical findings on home office during the coronavirus pandemic'). The increased use of home office, together with a high level of satisfaction, offers an opportunity for Germany to overcome its deeply entrenched culture of maintaining an office presence. Some high-ranking managers of large companies have already announced an extension of home office use in the future (Wirtschaftswoche 2020; Manager Magazin 2020). In addition, initial empirical findings from company surveys also indicate that about half of companies want to enable the use of more home office after the pandemic (Hofmann et al. 2020, 10; Alipour et al. 2020, 35). Therefore, it remains to be seen whether the respondents' fear that home office options will be severely restricted again following the pandemic will turn out to be justified.

Empirical findings on home office during the coronavirus pandemic

Under the current circumstances, numerous studies are concerned with the topic of home office, especially how widespread it is. Many of them differ in terms of survey method, sampling design and measurement or definition of home office. This sometimes leads to differing results. For example, the extent and intensity of home office will differ if the focus is on specific industries or company sizes, or if the survey targets only 'office workers' or all types of working people. Differences can also arise depending on whether random or self-selected samples are used (for examples of different study designs see Hofmann et al. 2020; Ernst 2020; Möhring et al. 2020; Bünning et al. 2020; Frodermann et al. 2020; Alipour et al. 2020). A comparison of results from different studies must therefore be carried out with great care. The data presented here are based on an online survey of Internet users in Germany. This means that people who never or rarely use the Internet are only partially represented in the present survey or not at all. It can be assumed that their home office use and opportunities to work from home are different from those of intensive Internet users.

Nevertheless, other studies on this subject carried out during the pandemic have shown quite similar results. The extension of home office happened abruptly at the beginning of the coronavirus crisis as a measure to contain the virus and to protect employees. This is why all studies find an increase in the use of home office. However, the determined extent of home office use differs depending on the study and the study design. Möhring et al. (2020) indicate that at the end of March a quarter of all working people were 'completely or predominantly' working from home. From May onwards, figures for home office use were recorded in a more differentiated manner: Including those working partly on site and partly from home, the total rises to just under 30% (Möhring et al. 2020, 3). A slightly higher value of 34% was found by Schröder et al. (2020, 11) in April, when they considered the proportion of all working people that were 'partly or completely' working from home. Also in April, a Europe-wide study (Eurofound 2020) found that 37% of working people in Germany were using home office during the pandemic. However, the frequency of home office activity was not recorded. According to this study, Germany is in the middle range compared to all other EU Member States. With a survey specifically directed at LinkedIn members in Germany, Alipour et al. (2020, 33) even established a home office proportion of 67%.

Many studies also deal with job satisfaction in home office (for more on the concept of job satisfaction, see Lesch et al. 2011). In most cases high satisfaction levels are observed. According to a survey by Fraunhofer FIT (2020), more than 80% were satisfied with their home office work in April. Ernst (2020, 4) also recorded high satisfaction levels of around 75% in an ad-hoc study in April. However, when these values are compared with the general job satisfaction rate, whether in home office or on site, these results are less surprising. For example, in 2017 a large majority of almost 90% of the working population said they were 'satisfied' or 'very satisfied' with their work (Destatis 2018). This makes it important to look at deviations among individual population groups from an otherwise generally high average. For example, a survey conducted by the WZB on job satisfaction in home office during the coronavirus crisis reveals lower satisfaction levels among women compared to men. →

Parents are also less satisfied than those without children (Bünning et al. 2020, 24). It is reasonable to assume that the effects of the double burden of parenting and working are noticeable here, as many childcare facilities were also closed in the course of the restrictions.

It is important now for employers and employees to negotiate a plan for the long-term application of flexible work models such as home office for the time after the current crisis. A system that combines the advantages of working from home with the benefits of working in the office seems to be a worthwhile goal. Gajendran and Harrison (2007), for example, show in an influential meta-analysis that working in home office for up to 2.5 days a week has largely positive effects. People who work in home office see their work as more autonomous and feel it is easier to better combine work and family life. Job satisfaction also increases when working from home. When staff are allowed to work from home, employers can also benefit from higher productivity and increased employee loyalty. Only when home office use exceeds 2.5 days a week do Gajendran and Harrison (2007) find negative effects, for example, on relationships with colleagues. Having staff in the office two to three days a week, enabling both formal and informal as well as social interaction, can counteract these negative effects (Weichbrodt/Schulze 2020). Clear boundaries for separating work and private life in home office also seem to be important, as studies point to possible negative health effects of working from home as well. For example, psychological and physical problems can develop when working intensively in home office, as it is often characterised by more stress, longer working hours and a blurring of the boundaries between work and private life (Bloom et al. 2015; Messenger 2017; Song/Gao 2018; Waltersbacher et al. 2019).

It remains to be seen whether a legal right to home office, as the SPD has been calling for (SPD-Fraktion im Bundestag 2019; Spiegel Online 2019), will even be necessary after the crisis-induced boost to home office working. If employers grasp the opportunities arising from the pandemic—to build a path to a future that integrates more flexible models of work—then it might not be necessary to burden the economic recovery phase with new, highly bureaucratic regulations. However, if companies show a tendency to revert to pre-crisis levels of enforced office presence, legal regulation similar to the Dutch model could be a sensible solution. On the one hand, this type of regulation would require employers to actively address their employees' desire for more home office opportunities. While on the other, it would not create a legal right to home office and so not trigger major further bureaucratic hurdles (see Box on page 25 'Home office in the Netherlands').

This study looks at the current increase in home office and some of the effects in isolation. However, a comprehensive analysis would have to take into account that further positive and negative effects might result from increased work from home. For example, a reduction in commuting traffic to and from work or fewer business trips would have positive effects on the environment. But for the travel industry in particular, this could have a negative impact and even threaten the survival of companies. (Sauer/Wohlrabe 2020, 70). It might be, as a result of the pandemic, that the market for commercial office space is forced to adapt should the demand for workspace within large companies fall (Manager Magazin 2020). At the same time, the demand for workspaces that can be both flexibly leased and are close to classic residential areas may also rise. To ensure social cohesion, social aspects must be kept in mind. Studies for example, clearly show that opportunities to work from home are more likely for those with a higher formal education, who might then profit the most (Brenke 2016). It is also important to be aware of the digital chasm that could start to open up more between those who can work from home and those who cannot. The effects revealed and accelerated by the pandemic will continue to concern society for a long time to come—and not just in the area of home office use. To this end, the diverse effects briefly outlined here should certainly be researched and explored more thoroughly in due course. Only then will it be possible to identify sensible options for upcoming decision-making processes and contribute to an evidence-based course of action.

Home office in the Netherlands

The Netherlands is one of the leaders among the EU Member States when it comes to home office use. Around 37% of the working population in the Netherlands worked at least occasionally in home office in 2019 (Eurostat 2020). A new law in the Netherlands to make access to flexible work models easier, passed with strong cross-party support, drew the attention of interested observers across Europe (Spiegel Online 2015; Wirtschaftswoche 2015). The 'Wet flexibel werken', as the law is called, came into force on 1 January 2016 (Overheid 2016). It regulates the conditions under which employees can request a change to their working hours, the location of working hours and the location from which they work. This means that employers in the Netherlands can only refuse their employees' requests for changes to working time on the grounds of serious operational or business concerns. In contrast, the employer may continue to refuse requests for changes to the work location without the need to demonstrate serious operational or business concerns. However, the law obliges companies to seriously consider their employees' wishes regarding changes to their place of work—which also covers home office—and to consult with their employees (Deutscher Bundestag 2016; Overheid 2016). In spite of what is often claimed (see, among others, Spiegel Online 2015; Wirtschaftswoche 2015), the law does not establish a legal right to home office (Eversheds Sutherland 2015; Deutscher Bundestag 2016; Palthe Oberman n.y.). However, it has stimulated the debate on the broader question of home office models. Proponents point to how the law strengthens the position of employees in matters of working from home, while opponents and employers' associations consider the law superfluous (Spiegel Online 2015). No direct effect on the spread of home office in the Netherlands has yet been observed, however. Since the law came into force, the proportion of Dutch people working at least sometimes in home office has increased by almost three percentage points. This increase is roughly in line with the general development of home office use in Europe. The proportion of people working at least sometimes from home changed by an EU average of around two percentage points between 2015 and 2019 (Eurostat 2020).

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Appendix of tables

Prevalence of home office usage among working people who were not in home office before the crisis

Data from the survey in March	Worked in home office	Didn't work in home office	Released from work because of the pandemic
All working people who had not used home office prior to the pandemic (N = 1,020)	16%	76%	8%
Men (N = 450)	13%	80%	7%
Women (N = 551)	19%	73%	9%

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in March 2020.
Percentages may not add up to 100 due to rounding.

Table A.1: Home office use by selected groups (weighted)

'I have serious difficulties using the technology required for working from home.'

Data from the survey in June	Completely agree	Rather agree	Neither/Nor	Rather disagree	Completely disagree
All working people who have used or are now in home office (N = 629)	3%	9%	13%	25%	50%
Experienced home office users (N = 432)	3%	9%	13%	25%	50%
Home office newcomers (N = 151)	3%	7%	10%	27%	53%
Men (N = 281)	3%	8%	13%	24%	51%
Women (N = 330)	3%	9%	12%	27%	49%
18–34 years (N = 87)	3%	5%	15%	27%	50%
35–54 years (N = 342)	4%	10%	12%	26%	48%
55 years and older (N = 197)	2%	8%	14%	23%	52%

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in June 2020.
Percentages may not add up to 100 due to rounding.

Table A.2: Technical difficulties in home office (weighted)

‘How satisfied are you with your own home office situation?’

		Very satisfied	Rather satisfied	Rather dissatisfied	Very dissatisfied
All working people in home office at the time of the survey	March (N = 693)	39%	42%	15%	4%
	June (N = 589)	50%	35%	11%	4%
Men	March (N = 335)	41%	42%	12%	4%
	June (N = 264)	50%	36%	10%	3%
Women	March (N = 344)	37%	41%	18%	4%
	June (N = 310)	50%	35%	11%	4%
Experienced home office users	March (N = 520)	41%	42%	13%	4%
	June (N = 435)	51%	36%	10%	4%
Home office newcomers	March (N = 173)	34%	41%	23%	2%
	June (N = 154)	46%	33%	15%	5%
18–34 years	March (N = 113)	40%	38%	19%	3%
	June (N = 80)	42%	40%	16%	2%
35–54 years	March (N = 391)	38%	45%	14%	4%
	June (N = 316)	51%	32%	13%	5%
55 years and older	March (N = 189)	42%	39%	15%	4%
	June (N = 190)	52%	37%	6%	4%

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in March and June 2020.
Percentages may not add up to 100 due to rounding.

Table A.3: Satisfaction with working in home office (weighted)

‘How satisfied are you with your own home office situation?’

All working people in home office at the time of the survey in June	Very satisfied	Rather satisfied	Rather dissatisfied	Very dissatisfied
Living alone (N = 110)	48%	33%	15%	4%
Living with partner, without children (N = 167)	53%	38%	6%	2%
Living with children under 14* (N = 153)	44%	34%	16%	6%
Living with children all over 14* (N = 107)	56%	34%	5%	5%
Women living with children (N = 138)	45%	35%	15%	6%
Men living with children (N = 114)	55%	37%	5%	4%
Women living without children (N = 143)	52%	38%	8%	2%
Men living without children (N = 129)	49%	35%	13%	3%

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in June 2020.
Percentages may not add up to 100 due to rounding.
* This includes people living with and without a partner, because of low cell frequencies.

Table A.4: Satisfaction with working in home office by household situation (weighted)

‘Would you like your employer to offer more home office opportunities after the crisis than was the case before?’

	Yes	No
All employees who consider home office to be possible in principle in their job (March, N = 929)	68%	32%
Men (N = 457)	65%	35%
Women (N = 456)	70%	30%
All employees who consider home office to be possible in principle in their job (June, N = 778)	69%	31%
Men (N = 353)	66%	34%
Women (N = 401)	72%	28%

Source: bidt survey of Internet users in Germany over 18, conducted with Google Surveys in March and June 2020.

Table A.5: Desire for increase in home office opportunities (weighted)

Endnotes

1 Telecommuting is any model of mobile working in which employees perform their work duties outside their employer's premises. In the case of home office, telecommuting takes place from the employee's own home.

2 For a chronology of the events surrounding the COVID-19 pandemic, cf. MDR (2020).

3 This type of sampling (river sampling) is fundamentally different from purely random sampling and pre-recruited online panels. In contrast to a purely random sample in the classical sense, it is not possible to define a population. For this reason, it is not possible to determine the sampling probability for any given element in the sample. However, the distribution of demographic characteristics in such a sample, among other indicators, shows good alignment with previous studies of Internet users (cf. Pew Research Center 2012).

4 Online surveys are usually self-administered surveys. In this format, the interview situation is not subject to any control whatsoever—unlike interviews conducted in person or by telephone. This means that the data must be checked and cleansed intensively, for example to exclude answers from respondents who do not answer the questions seriously. First, respondents were identified who had completed the online questionnaire in an unrealistically short time. The lower time limit was set at the lowest percentile of the average response time. It is assumed that at this speed, it is not possible to attentively read and answer the questions. By looking at the answers given by these quick responders, it is clear that their data needs to be excluded from the analysis. A second step to cleanse the data involved identifying cases where a single respondent provided contradictory information about their profession or home office use. These inconsistencies could not be prevented in advance, since the questionnaires in Google Surveys do not allow for more complex filtering. Some respondents were excluded for more than one reason. This meant that in the end, 2,003 responses in each wave of the survey were accepted.

5 To ensure that the results of the analyses of the data collected are representative of adult Internet users in Germany, the responses were weighted. Weighting factors were calculated by the Bavarian Research Institute for Digital Transformation (bidt) as the weights provided by Google Surveys were only available for the entire sample, before data adjustments. The weighting was based on combined age and gender demographics of adult Internet users and the regional distribution of the total population in Germany.

Since the data included grouped age information and the gender of the respondents twice—coming from both a direct question and as 'estimated' by Google Surveys (based on participant's browsing behaviour) (Google 2018)—this information was combined. Self-reported participant age was prioritised. If this was not specified, the Google Surveys' estimate was used, if available. In the case of age, the proportion of missing values was reduced to 1% (March) and 3% (June). Since official data on Internet usage is currently only available for male and female adults, but the gender input field also contained the option 'other', the following approach was taken: In cases where other gender was specified, as well as in cases where no gender was specified, the presumed gender estimated by Google Surveys was used. For the relevant weighting variable, 34 and 74 cases remained in each wave for which no age and gender data were available.

In the following, the weighting factors were calculated on the one hand from the distribution of male and female Internet users by age in Germany (Destatis 2020, 13), and on the other hand from the regional distribution of the total German population (Destatis 2019). Weighting factors were calculated with regard to the distribution of adult Internet users in Germany by gender and age, reported by the Federal Statistical Office, assuming an equal distribution in the age group 16 to 25 (Destatis 2020, 13). Regional distribution was determined using the location reported by Google Surveys, based on the user's IP address (Google 2018). Because some states such as Bremen had low cell frequencies, data was aggregated to seven Nielsen areas—a common procedure in market research. No regional information was available for two observations in March and one in June. Weights were determined using the iterative proportional fitting procedure, with the help of IPFWEIGHT (Bergmann 2011) in Stata 16. If no information was available for one of the two weighting dimensions, these observations were assigned a weight of 1.0. The weights (see Table 1) are in a range generally considered to be uncritical (DeBell et al. 2009, 31, quoted from Bergmann 2011).

6 The two complete questionnaires (in German) are available upon request.

7 In the first survey at the end of March, household composition was not surveyed.

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