Working conditions and sustainable work


Working conditions in the time of COVID-19: Implications for the future

Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.
Work-related changes during the COVID-19 pandemic:
Exploring longitudinal data from the European Working Conditions Survey

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Eurofound reference number: WPEF22047

Acknowledgments: Thank you to the Eurofound colleagues who reviewed the paper: Dragoș Adâscăliței, Agnès Parent-Thirion, Christopher White, Gijs van Houten and Barbara Gerstenberger.

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Introduction

When the data collection of the 7th European Working Conditions Survey (EWCS) was stopped due to the outbreak of the COVID-19 pandemic, Eurofound quickly started preparing the 2021 European Working Conditions Telephone Survey (EWCTS). At the time of writing this Working Paper, the final Overview Report of this data collection is being edited and is close to be published (Eurofound, 2022 forthcoming).

The interrupted survey gave the Eurofound team the opportunity to carry out an experiment, which so far had not been possible: to recontact respondents\(^1\) from the discontinued 7th EWCS for the new data collection and repeat the questions in the consecutive year creating a panel data set. Although the final sample size was small, it gave Eurofound the option to carry out panel analysis on these data (CAPI-CATI data set\(^2\)) and to demonstrate to our stakeholders the value of longitudinal data for monitoring job quality.

Longitudinal data can help to detect causal mechanisms, something that is not possible in cross-sectional settings. Such data also helps to acknowledge that social and work-related problems and vulnerabilities are more widespread than they appear from a static perspective (Walker, 1995). This indicates that the number of people experiencing disadvantage during a year or over a longer period is usually much higher than cross-sectional snapshot figures suggest. While it can be argued that working life is dynamic and hence it is more important to focus on persistent disadvantage in working conditions rather than on temporary problems, from a policy point of view it could also be argued the other way around: Precarious transitions will be more common and probably experienced repeatedly among vulnerable groups as was also seen against the backdrop of COVID-19 with unemployment hitting foremost workers in precarious jobs (Eurofound and European Commission, 2021). Such temporary events can also have scarring effects on long-term working lives. Furthermore, when monitoring turnover, measurements might be affected by arbitrary measurement errors (Moisio 2004), which could in turn imply that latent disadvantage is interrupted by favourable events of short duration (see Lazersfeld’s model of oscillating turnover, 1972). Furthermore, data collection in 2021 for the EWCTS was also influenced by changes in employment and work. Against this background, it should have become clear that longitudinal data detecting gross change have various advantages which makes them ideal to study labour market outcomes and working conditions.

In this working paper, we explore the potential of the EWCS follow-up survey (CAPI-CATI dataset) to monitor changes in job quality and how they are associated with other changes in structural characteristics such as changes in working from home, job changes and in wellbeing and engagement. Using advanced statistical methods, we analyse the magnitude of changes and the direction of changes apparent in the data considering the methodological constraints of low case numbers, mode effects and coverage.

The remainder of the working paper is organised as follows: After an introduction into the methodology of the data collection, we profile the sample achieved against the weighted data of the EWCTS 2021. Next, we explore changes in household composition, jobs, place of work before we discuss change in six job quality dimensions and working life outcomes (health, wellbeing and

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\(^1\) In case that they had agreed in the survey to be recontacted by Eurofound for research purposes

\(^2\) CAPI – computer assisted personal interviewing, CATI – computer assisted telephone interviewing

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engagement). In chapter 6 we examine simultaneous changes in job quality and other outcome variables before we apply a multivariate model in chapter 7 predicting changes in job quality with structural variables and changes in working life outcomes. Two types of changes are explored in this model: net changes (improvements/deteriorations) and gross change (overall turnover).
Methodological background

EWCS History

Since 1991, Eurofound has carried out the European Working Conditions Survey which monitors working conditions in Europe. It provides key time series measures on working conditions, job quality and the quality of working lives across Europe and allows analysis of the relationships between different aspects of working conditions. It also provides Eurofound and its stakeholders with the data it needs to assess progress and to monitor vulnerable groups at risk or issues of concern in the labour market over time.

Seven editions of the EWCS using face-to-face interviewing have taken place so far: in 1991, 1995, 2000/2001, 2005, 2010 and 2015. The seventh edition of the EWCS was commissioned by Eurofound in 2020 and although face-to-face fieldwork started in February, it was terminated after nine weeks due to the spread of COVID-19.

EWCTS 2021 and follow-up interviews from 2020

Following this, Eurofound worked in close collaboration with Ipsos, the contractor for fieldwork, to fully transition the methodology from face-to-face interviewing (CAPI) to Computer Assisted Telephone Interviewing (CATI). Fieldwork for the EWCTS 2021 ran from March – November 2021.

Alongside this, Eurofound also commissioned Ipsos to conduct a follow-up survey with those people who took part in the EWCS CAPI 2020 survey prior to its suspension, and who consented to be recontacted to take part in a follow-up interview. The questionnaire for follow-up interviews was based on the version of the EWCS 2020 but shortened in length to accommodate a telephone interviewing mode. It also focused on:

- whether the contact details provided during the previous CAPI interview were accurate and complete (during the screening)
- how the pandemic affected the employment status of workers and whether they were still at work
- limited number of follow-up questions and any changes to the respondents working conditions.
- collecting consent and contacting details for further research, carried out by Eurofound or a partner agency.

All data and information provided in this report covers the EWCS follow-up survey and therefore should be considered in this context. Furthermore, although the research can potentially produce some valuable insights into the changes that have occurred against the backdrop of the COVID-19 pandemic, this sample is not comparable to the data from the EWCS CATI 2021 nor previous editions of the EWCS.

For further information on the questionnaire development and finalisation please see Chapter 5 (Questionnaire Development and Translations) of the main technical report.

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Sample

The EWCS follow-up survey was carried out in 21 EU Member States. No follow-up interviews could be carried out in Czechia, Estonia, Germany, Greece, Italy and Slovakia. The reasons for their exclusion are as follows:

Czechia/Slovakia: due to issues with the fieldwork supplier, CAPI fieldwork had not yet been launched by the time fieldwork was suspended.

Estonia: again, due to issues with the fieldwork supplier, only ten interviews had been achieved by the time fieldwork suspension.

Italy: as the country was one of the worst affected at the start of the pandemic, only 36 interviews were achieved by the time fieldwork was suspended.

Germany: the recontact questions were not asked as part of the EWCS 2020 survey as Ipsos Germany indicated they had to comply with the rules imposed by ADM (the German Market Research Association).

Greece: the levels of consent for recontact were very low in Greece – less than 10 cases.

During the EWCS CAPI 2020 survey, respondents who agreed to be recontacted were asked to provide a telephone number and/or email address for this purpose. The initial gross sample consisted of contact details collected, including personal information such as the respondent’s name and age.

The size of the initial gross sample was 3,355 individuals, which is the total number of respondents across the countries that agreed to be recontacted. This total excludes Estonia, Italy and Greece, where the acquired sample was not sufficient to conduct a representative survey. However, after checking the quality of the sample, it was noted that some identification numbers (IDs) lacked usable telephone numbers or email addresses. From the initial 3,355 respondents, 3,252 (97%) had contact information that could be used for the survey. The sample that did not have usable telephone numbers and email addresses were removed and the rest of the telephone numbers were sent to the countries for the purposes of a telephone number format validity check. Following this, all invalid telephone numbers (which also lacked email information which could have provided another means of checking) were removed. The local teams confirmed the usability of 2,910 respondents and these were used as the final gross sample.

The size of the available sample for the survey depended on the number of people that agreed to be recontacted, but also on the number of interviews that were completed before the survey was suspended due to COVID-19. Because of this, a target based on a representative sample of 21 EU Member States was estimated.

To best allocate the resources available for the exercise (given that unit costs per country vary), country managers were asked to estimate response rates for their individual countries. They had to take into consideration that this is a re-contact survey, which influences the estimations for the response rate. Based on these estimates and the sample available, the project team allocated the

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4 This refusal was based on the “Declaration for the Territory of the Federal Republic of Germany concerning the ICC / ESOMAR International Code on Market, Opinion and Social Research and Data Analytics” undersigned by ADM, BVM, ASI and DGOF. It was felt, however, that Ipsos Germany had misinterpreted this document. Discussions to re-introduce these questions in Germany had started at the time fieldwork stopped due to the Covid-19 outbreak.
sample with a view to reaching an EU-wide representative sample. This sample allocation guided the sample management process throughout fieldwork. As the fieldwork advanced, the sample allocation strategy was amended with a view to maximising the number of completes and the efficiency of the contract.

**Table 1 Initial target and completes**

<table>
<thead>
<tr>
<th>Country</th>
<th>Country target</th>
<th>Target based on an EU-wide representative sample</th>
<th>Available sample with contact data</th>
<th>Completes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>48</td>
<td>48</td>
<td>148</td>
<td>16</td>
</tr>
<tr>
<td>Belgium</td>
<td>48</td>
<td>53</td>
<td>109</td>
<td>29</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>80</td>
<td>36</td>
<td>186</td>
<td>67</td>
</tr>
<tr>
<td>Cyprus</td>
<td>23</td>
<td>5</td>
<td>44</td>
<td>20</td>
</tr>
<tr>
<td>Denmark</td>
<td>50</td>
<td>32</td>
<td>168</td>
<td>64</td>
</tr>
<tr>
<td>Finland</td>
<td>25</td>
<td>28</td>
<td>89</td>
<td>7</td>
</tr>
<tr>
<td>France</td>
<td>220</td>
<td>300</td>
<td>298</td>
<td>84</td>
</tr>
<tr>
<td>Croatia</td>
<td>45</td>
<td>19</td>
<td>161</td>
<td>49</td>
</tr>
<tr>
<td>Hungary</td>
<td>33</td>
<td>50</td>
<td>74</td>
<td>8</td>
</tr>
<tr>
<td>Ireland</td>
<td>65</td>
<td>25</td>
<td>179</td>
<td>61</td>
</tr>
<tr>
<td>Latvia</td>
<td>35</td>
<td>10</td>
<td>115</td>
<td>20</td>
</tr>
<tr>
<td>Lithuania</td>
<td>35</td>
<td>15</td>
<td>112</td>
<td>25</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>113</td>
<td>3</td>
<td>225</td>
<td>48</td>
</tr>
<tr>
<td>Malta</td>
<td>155</td>
<td>3</td>
<td>237</td>
<td>47</td>
</tr>
<tr>
<td>Netherlands</td>
<td>98</td>
<td>99</td>
<td>186</td>
<td>106</td>
</tr>
<tr>
<td>Poland</td>
<td>45</td>
<td>181</td>
<td>101</td>
<td>32</td>
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<tr>
<td>Portugal</td>
<td>38</td>
<td>53</td>
<td>92</td>
<td>42</td>
</tr>
<tr>
<td>Romania</td>
<td>13</td>
<td>95</td>
<td>98</td>
<td>18</td>
</tr>
<tr>
<td>Slovenia</td>
<td>100</td>
<td>11</td>
<td>354</td>
<td>120</td>
</tr>
<tr>
<td>Spain</td>
<td>28</td>
<td>219</td>
<td>170</td>
<td>54</td>
</tr>
<tr>
<td>Sweden</td>
<td>43</td>
<td>56</td>
<td>106</td>
<td>23</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,340</strong></td>
<td><strong>1341</strong></td>
<td><strong>3,252</strong></td>
<td><strong>940</strong></td>
</tr>
</tbody>
</table>

*Source: Ipsos*
Evaluation
The EWCS CATI recall survey was overall a successful project, given that fieldwork was completed in a timely manner with no major issues arising.

In terms of minor issues that arose, and lessons learned for the future, one difficulty related to the poor quality of some of the contact details that were collected during the EWCS CAPI 2020 fieldwork. This feedback was mainly shared by Lithuania and the Netherlands, although it should be noted that these concerns were also voiced by new agencies that did not conduct the fieldwork for the previous CAPI study.

A second issue that arose after the end of fieldwork related to incorrect estimations provided by the local agencies as to how many completed interviews they expected to achieve from the sample. This was particularly the case in France where 38% of their estimated target were achieved. However, the agency noted that their initial estimations were based on a good response rate given that these individuals had agreed to be recontacted and were likely to be spending more time at home given the COVID-19 restrictions in place across Europe. In addition, other countries were able to achieve more completed interviews than they originally estimated (e.g., Spain) or came very close to their targets (Croatia, Romania and Slovakia). Furthermore, comparisons revealed that the profiles of the face-to-face and follow-up surveys were relatively consistent, although it was more difficult to recruit younger respondents (aged 15-24) for the study and there was a general decrease in the proportion of self-employed individuals who were interviewed.

Although the countries had differing response rates and profiles, the dynamic management of the sample and personnel involved ensured that the quality and efficiency of the project was maximised. Furthermore, it can be said that the commitment by all parties, as well as a well-established working relationship between Eurofound and Ipsos, ensured the success of the study.

Disclaimer
It is important to note that with the achieved sample no representative studies can be conducted. Due to several medium and big countries such as Italy, Germany and Czechia missing from the sample, the results can also not be weighted to an EU27 population. Furthermore, the different modes in which these surveys were carried out and the different questionnaires (order of items etc.) do not allow for a final assessment of the cause of change detected in the dataset. The following analyses have therefore mainly experimental character. Results are not weighted and only represent the sample itself.
Profiling the sample

In this chapter we compare distributions of the EWCS Recall (CATI Recall) with the weighted data from the EWCTS, which is closer to the real population for EU workers. The sample consists of 371 men (49%) and 387 women (51%). In comparison to the EWCTS 2021, the distribution is slightly different, because EWCTS consists of 54% men and 46% women. In contrast, the sample is close to the EWCTS when it comes to the age of respondents, a majority of 51% is younger than 45 years old, whereas in the EWCTS it is 53%. More than half of the sample (53%) have tertiary and 47% have secondary education. In EWCTS’s weighted sample, 44% of respondents have tertiary and 55% have secondary education. Thus, the sample of the CATI Recall consists of slightly different respondents when it comes to education. One-quarter of the sample live in a two-person household, one-quarter in three- and a further quarter in a four-person household. Only 11% live in single households. However, the EWCTS dataset shows a slightly different distribution of respondents. About 17% live in a single household, 28% in two-person households, and 22% in a four-person household.

**Figure 1 Age distribution of the sample compared to the EWCTS 2021, %**

Most respondents of the sample worked full-time and almost a quarter (24%) said they worked on a part-time basis. The proportion of part-time work was 20% in the EWCTS. Around 7% of the sample (49 respondents) said that they had more than one job. This share is close to the EWCTS, where 9% of workers had more than one job. Most of the respondents of the sample of the CATI Recall had an employment contract with unlimited duration (75%), 10% or 72 respondents had a fixed-term contract, another 10% were solo-self-employed and 2% (13 respondents) were self-employed with employees. In the EWCTS data the representation of employees’ contracts is as following: contract of unlimited duration (81%), contract of limited duration (12%), temporary employment agency contract (2%), apprenticeship or other training schemes (2%), no contract (2%) or other contracts (2%).

**Source: Eurofound, CATI Recall 2021 and EWCTS 2021 (weighted)**

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The sample is distributed across the broad economic sectors as follows: almost 2 in 10 worked in the ‘other services’ sector, which corresponds in the EWCTS as shown in Figure 2 below, 17% in industry, 13% in health, 12% in commerce and hospitality, 12% in education and 9% in the public administration. Another 36 respondents worked in construction (5%), 32 in financial services (4%), and 22 in agriculture (3%). Perhaps the biggest differences between the CATI Recall and the weighted EWCTS can be seen in the commerce and hospitality sector, with 18% of workers in this sector in the latter and 12% in the CATI Recall. More than half of the sample distributes across three occupations (see Figure 3): professionals (26%), technicians (15%), and service and sales workers (14%). One in 10 respondents worked as managers (10%), clerical support workers (9%), craft and related trades workers (9%) or in elementary occupations (9%) respectively. Another 44 respondents (6%) worked as plant and machine operators and 17 persons as skilled agricultural workers. Compared to the EU27 average, there is some overrepresentation of professionals and managers, while craft workers and plant/machine operators are slightly underrepresented.

**Figure 2 Distribution across sectors, %**

![Figure 2 Distribution across sectors, %](image)

*Source: Eurofound, CATI Recall 2021 and EWCTS 2021 (weighted)*
Figure 3 Distribution across occupation, %

Source: Eurofound, CATI Recall 2021 and EWCTS 2021 (weighted)

When it comes to workplace size, respondents of the CATI Recall worked mostly in places with 10-49 employees (32%), followed by 1-9 employees (31%). A high proportion of workers worked in workplace size 50-249 (25%) and the lowest number of respondents (12%) in organisations with 250 or more staff. This distribution is not far from the EWCTS, however, some differences can be observed, such as 33% of EWCTS respondents worked in small 1-9 employees workplace, 28% in workplaces with 10-49 employed people, followed by 21% of workers in SMEs (50-249) and 18% in large organisations with 250 employed people or more.

The studied sample also shows some differences with the EWCTS regarding the degree of urbanisation. In the EWCTS most workers live in cities (44%) followed by towns and suburbs (33%) and the smallest number representing rural areas (22%). These proportions are slightly different in the CATI Recall sample, where cities and towns, and suburbs categories are represented in the sample with a nearly equal share (35% and 34% respectively), followed by 31% of respondents from rural areas as illustrated in Figure 4. The recall data only covers a subset of EU27 countries. The profile of those countries can quite plausibly be more rural than that of all the EU27 countries. This can also explain the difference in the distributions according to degree of urbanisation, and – probably to a lesser extent – some of the other differences found.
Household composition of CATI Recall and EWCTS data is very similar. The most underrepresented group in the CATI Recall are households consisting of two adults without children. The difference between the two surveys is approximately 4 percentage points. Differences can be also observed in the category of two adults with children. It is important to note that the coding of household composition does not consider relationships between included people. Therefore, for example the category ‘two adults with children’ cannot be assumed as a couple, and their child/children. They may be relatives or have another type of relationship. Also, due to the nature of the survey which studies working conditions, adults are coded as people of age 16+ since they can work above that age.

Source: Eurofound, CATI Recall 2021 and EWCTS 2021 (weighted)
Figure 5 Household composition, %

![Bar chart showing household composition](chart1.png)

Source: Eurofound, CATI Recall 2021 and EWCTS 2021 (weighted)

Figure 6 shows that in the CATI Recall dataset people with secondary education are underrepresented in comparison to the EWCTS. Consequently, people with tertiary education are overrepresented in the CATI Recall. Questions about formal educational attainment levels were not asked again in the 2021 recontact.

Figure 6 Formal educational attainment, %

![Bar chart showing educational attainment](chart2.png)

Source: Eurofound, CATI Recall 2021 and EWCTS 2021 (weighted)

Overall, it can be concluded that the distributions of both samples are similar. This was somehow unexpected and is a positive insight as the CATI recall has undergone a lot of non-response and only consists of a small sub-sample not covering all EU Member States. However, it cannot be ruled out that this is a random result as could be implied by systematic differences between sub-groups. Given
the low sample size in some of the subgroups, the data presents significant limitations in terms of general conclusions. The analyses that follow therefore are based on unweighted data and represent only the sample itself.
Changes in household composition, jobs, place of work

In this section we investigate changes in household composition, jobs and changes regarding the place of work. Later, in a multivariate (dynamic) model (meaning that it includes predictor variables that change over time), it will be analysed if these changes are significantly associated with changes in job quality.

Changes in household size and household composition

When looking at these developments, it is important to keep the context of these changes in mind. The survey was carried out in times of lockdowns and restrictions across EU member states. In 15% of respondents’ household, the number of persons increased between 2020 and 2021 and in 11% the number went down. This development is also reflected in the number of children in the household, which increased in 10% of respondents’ households, while 6% of respondents reported fewer children in the household than in 2020.

Figure 7 Change of household size, % of respondents

Source: Eurofound, EWCS CATI Recall 2021

Reading note: 15% of respondents reported a bigger household size in 2021 than in 2020, while 11% reported a smaller number by any amount (74% reported no change in the size of their households).

Out of 105 respondents, who lived alone, 65 still did so in 2021, 19 respondents changed to a two-person household, another 10 lived in a household with more than two adults in 2021 and the rest distributed across other types of households. Of 187 workers who lived in two-adult-households, 147 remained in the same type, 14 changed into more-than-2-adult households, 11 reported children in their household and 8 became single households. Most of the 187 respondents who lived in households with two adults and children remained in that type (159), 17 changed to households with more than two adults and children and 4 became single parent households. Of 186 respondents in more than two adult households, only 133 reported to live in this type also in 2021, 27 changed to...
a two-adults household, 8 became single households and 10 became two adult households with children.

**Changes in jobs**

Around 11%, that is 85 respondents, changed their jobs (69 respondents) or role and responsibilities (16) between 2020 and 2021. These job changes were distributed across occupations. However, most job changers were professionals (13) and service or sales workers (14). They mostly worked in other services (13), health (9) and commerce and hospitality (10). Most job changers (63) were employees with contracts of unlimited duration, nine had fixed-term contracts and another nine were solo-self-employed. Information on the employment status was, however, not re-collected in the CATI recall. 47 workers who changed their jobs were men and 38 were women. Out of 15 job-changers who ‘strongly agree’ or ‘tend to agree’ that it was likely they might lose their job in 2020, 5 changed this statement to ‘tend to disagree’ or ‘strongly disagree’. More than half of the job changers (52%) had been in their previous jobs five years or less, compared to 49% of those who did not change their jobs.

**Figure 8 Profile of job-changers, respondents (absolute numbers)**

![Figure 8 Profile of job-changers, respondents (absolute numbers)](image)

*Source: Eurofound, EWCS CATI Recall 2021*

**Changing work locations**

Unsurprisingly, the frequencies of attendance at the place of work changed substantially, against the backdrop of the pandemic. In the CATI recall of 2021, 28% of respondents said they worked always or often from home, this was the case for a proportion of only 9% in the 2020 interview. Similarly, 53% said they worked exclusively from their employer’s premises, which was the case for 64% a year before.

On the one hand, 165 respondents or 18% of the sample changed their workplace highest frequency to ‘from home’. They worked from home always or often in 2021 but less in 2020. On the other hand,
only 50 respondents or 5% of the sample worked less frequently from home in 2021 than the year before.

When looking at place of work ‘employer’s premises’, 256 respondents or 28% of the sample worked at a lower frequency than ‘always/often’ on site, while 50 respondents or 5% of the sample increased the frequency on site between 2020 and 2021.

Changes happened also regarding other work locations, but to a lesser extent. For instance, 86% or 817 respondents kept working always or often in their vehicles (7% less often / 6% more often). 11% or 104 respondents replied to work less frequently at a client’s site, while 9% did so more often.

**Figure 9 Changes in work locations, % of respondents**

![Figure 9](image-url)

*Source: Eurofound, EWCS CATI Recall 2021*
Changes in job quality

The CATI recall dataset offers the opportunity to observe workers’ job quality over time. Job quality can be described by analysing indicators one by one or by utilising them to create job quality indexes such as in Eurofound (2017). In this section, some of the indicators contributing to the change in the indexes as defined in Table 2 are discussed; and then the 2020 to 2021 change in each index is shown, including the breakdown by sector and occupation. For various items, the CATI Recall survey used a simplified five items scale (‘never’, ‘rarely’, ‘sometimes’, ‘often’, ‘always’), while in the CAPI 2020 a seven items scale was used (‘all of the time’, ‘almost all of the time’, ‘around 3/4 of the time’, ‘around half of the time’, ‘around 1/4 of the time’, ‘almost never’, ‘never’) rendering direct comparisons of these items over time challenging. For cases where different scales were used, the distribution in each year is shown, while for the creation of the indexes the variables have been normalised on a scale from 0 to 1.

The job quality indexes developed for the Overview Report of the EWCS 2015 (Eurofound, 2017) have been adapted according to the variables available in both 2020 and 2021 of the EWCS CATI recall dataset.

Table 2 Job quality indices and its components

<table>
<thead>
<tr>
<th>Index</th>
<th>Description according to Eurofound (2017)</th>
<th>Variables used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical environment</td>
<td>assesses physical risks in the workplace.</td>
<td>Noise, chemicals, exposure to infectious materials, tiring positions, carrying heavy loads, repetitive movements</td>
</tr>
<tr>
<td>Social environment</td>
<td>measures the extent to which workers experience supportive social relationships as well as adverse social behaviour, such as bullying and harassment</td>
<td>Support colleagues, support manager, verbal threats, sexual harassment</td>
</tr>
<tr>
<td>Skills and discretion</td>
<td>measures learning and training opportunities in the job and autonomy levels</td>
<td>Training paid by the employer, autonomy order, autonomy method, autonomy speed, consulted about changes, improving work organisation, influence on decisions *</td>
</tr>
<tr>
<td>Work intensity</td>
<td>measures the level of work demands in the job</td>
<td>Working against tight deadlines, working at high speed, facing emotionally disturbing situations</td>
</tr>
<tr>
<td>Working time quality</td>
<td>measures the incidence of long working hours, scope to take a break, atypical working time, working time arrangements and flexibility</td>
<td>Number of working hours, able to take time off at short notice, working during free time, being called to work at short notice, working at night, working shifts</td>
</tr>
<tr>
<td>Prospects</td>
<td>takes into account employment status, career prospects, job security and downsizing of the company</td>
<td>Career prospects, losing one’s job in the next 6 months</td>
</tr>
</tbody>
</table>
Notes: more information about the indexes are available in Eurofound (2017). The earnings variable is not available for both years, so the earnings index has not been included in this analysis. *The full skills and discretion index also takes into consideration the skills level which in this case was only asked in 2020.

Physical environment

Tiring or painful positions are a component of the workplace physical environment, this indicator, as the other ones presented in this section, is measured with a 7 items scale in 2020 and it was normalised to 5 items to allow comparison with 2021. On average, less respondents reported tiring positions in 2021 than in 2020. Tiring positions reporting decreased, on average, both among those who changed job (from an average of 0.66 to 0.73) and among those who kept the same job (from 0.65 to 0.72).

The nature of the longitudinal data allows also to explore beyond the overall group change between the two years: it is possible to look at the shift that each of the respondents experienced and find out in which direction it moved. On the positive side, 36% of the respondents reported they ‘never’ or ‘rarely/almost never’ experienced it with no change between 2020 and 2021. A share of 15% of the respondents reported an improvement. On the negative side, for 3% of them painful positions for ‘half of the time/ sometimes’ remained a feature of their job in both years. Around one third of the respondents who did not experience tiring or painful positions in 2020 (never or almost never) reported exposure in 2021 (‘always’ or ‘often’ or ‘sometimes’). And for 15% the situation was poor in 2020 and stayed so in 2020.

Figure 10 Tiring positions –change 2020 -2021 in %

![Figure 10 Tiring positions –change 2020 -2021 in %](image)

Source: Eurofound, EWCS CATI Recall 2021

The noise indicator recorded a decrease between 2020 and 2021, the average in 2020 moves from 0.78 to 0.74 for job changers and from 0.80 to 0.75 for those who stayed in the same job.

In 2020 and in 2021, respondents who were never exposed to ‘noise so loud that they would have to raise their voice to talk to people’ were just more than half of the sample (56%). Workers who ‘never’ or ‘almost never’ experienced noise in 2020, reported being ‘often’ or ‘always’ exposed in 2021 (6%), interestingly with a higher proportion being in the same job (13% versus 6%). Further data would be
needed to determine if this change depended on the wearing of masks, physical distancing, poor internet connection or a combination thereof.

**Figure 11 Noise – change 2020 -2021**

![Noise change 2020-2021](image-url)

*Source: Eurofound, EWCS CATI Recall 2021*

**Box 1. Coding seven items and five items scales**

The literature does not give a definite answer on how to directly compare two different scales, but for the EWCS questionnaire items extensive cognitive testing was carried out and proved that seven items scales well matched five items scales except for sitting (Hadler et al. 2022) in cognitive testing. A slight preference of lower choices was found in the case of seven items scales. In an ideal case the scale would be the same in the two years; to compare the observations made in 2020 and in 2021, the authors of this paper combined the two scales for the physical environment indicators as per the table below:

<table>
<thead>
<tr>
<th>2021</th>
<th>2020</th>
<th>Combining the two scales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always, Often, Sometimes</td>
<td>All of the time, Almost all of the time, Around 3/4 of the time</td>
<td>Poor job quality</td>
</tr>
<tr>
<td>Never, Rarely</td>
<td>All of the time, Almost all of the time, Around 3/4 of the time, Around half of the time, Around 1/4 of the time</td>
<td>Better in 2021</td>
</tr>
<tr>
<td>Never, Rarely</td>
<td>Almost never, never</td>
<td>Good job quality</td>
</tr>
<tr>
<td>Often, always</td>
<td>All of the time, Almost all of the time, Around 3/4 of the time</td>
<td>Worse in 2021</td>
</tr>
<tr>
<td>Sometimes</td>
<td>Half of the time</td>
<td>Around half of the time in both years</td>
</tr>
</tbody>
</table>
During the pandemic, one of the working environment aspects to consider was the handling or being in direct contact with infectious materials, such as waste, bodily fluids, laboratory materials, and so on. The average for this indicator, in 2020, was 0.86 for job changers and 0.88 for those who stayed in the same job. In 2021, the average went up for both response categories to 0.90 for job changers and 0.87 for those who stayed in the same job, meaning that for both categories the exposure to infectious material decreased. Looking beyond the average, at the gross change, nearly two thirds of the sample (72%) did not report exposure to infected materials in 2020 nor in 2021. A proportion of 11% ‘never’ or ‘almost never’ experienced contact with infectious materials in 2020 but did report it during 2021.

**Figure 12 Infectious materials – gross change, % of respondents**

![Graph showing infectious materials](source)

Source: Eurofound, EWCS CATI Recall 2021

The physical risk environment index combines noise, chemicals, infect, tiring positions, carrying heavy loads, and repetitive movements. Overall, there was no change for 80% of the respondents while for 11% the quality of their physical environment at work degraded and for 9% it improved. Delving deeper into the category switch that happened for those who experienced a change, for 8% it dropped from the top category to the last, for 11% it went below the mid-point and for 9% it backtracked from the top category to the one below.

When looking at the breakdown by occupation and by sector, the occupations (Figure 13) which suffered the biggest deterioration of their job quality in the physical environment dimension were services and sales workers, clerical support workers, and professionals. Elementary occupations workers reported both the highest improvements and deteriorations (14% in both directions) of their job quality in this dimension, which is very important for individual workers; but resulted in no net change at the category level. The categories with the highest share of workers enjoying good quality of work in both 2020 and 2021 were professionals, technicians, and clerks.
Work-related changes during the COVID-19 pandemic: Exploring longitudinal data from the European Working Conditions Survey

Social environment

One of the elements helping to cope with the pandemic was support by colleagues and managers. For 75% of the respondents the support was rated as a stable ‘always’ present or ‘most of the times’ in both years. For 6% of the respondents the support of colleagues improved from 2020 to 2021, while it declined for 7% of them. Overall, the net change is negligible at -1%.

The support of managers stayed at good levels (always and most of the times) for 43% of the respondents, but it dropped for 9%, who experienced the highest level of support in 2020. However, 2021 also meant that 9% reported an improvement to a higher level of support compared to 2020.

The discrimination and abuse variables show little change with around 2% of respondents were in a discrimination or abuse situation in both 2020 and 2021. 2021 saw an increase of verbal threats (8%), bullying (6%) and sexual harassment for 2% of the respondents.

Figure 14 Discrimination and abuse, % of respondents

Source: Eurofound, EWCS CATI Recall 2021

Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.
The quality of the social environment remained unchanged for most of the respondents (82%) while it improved for 9% and it degraded from a higher category for 10%. More in detail, 76% of the respondents enjoyed a very good working environment in both 2020 and 2021; 5% of the respondents reported a downward shift to the lowest category while for 19% of the respondents the variation was in between the middle categories.

The quality of the social environment across occupation was good for more than half of the respondents in each occupational group. Between 2020 and 2021, the occupations for which deterioration is reported more frequently than improvement are plant and machine operators, clerks, and professionals.

**Figure 15 Social environment - gross change by occupation, % or respondents**

![Social Environment Change by Occupation](image)

Source: Eurofound, CATI Recall 2021 and EWCTS 2021 (weighted)

**Skills and discretion**

The possibility of receiving training paid by the employer, the level of autonomy in the order of tasks, autonomy in choosing methods and speed of tasks combined with being consulted about, and or being able to influence changes in one’s workplace, are all dimensions which concur in establishing the skills and discretion index.

The autonomy scale was changed from ‘yes/no’ to a 5 items scale, with the limitation that all ‘yes’ correspond to 1 and all ‘no’ correspond to 0. Table 3 displays the distribution of the respondents’ answers in 2020 and 2021. The number of people who maintained a high level of discretion for the three dimensions of autonomy ranges from 56% to 66%, while for around 10% of the respondents a poor level of autonomy persisted. Notably, to calculate the index the two scales have been normalised on a scale from 0 to 1.

**Table 3 Distribution of answers to the autonomy questions. Respondents (absolute numbers)**

<table>
<thead>
<tr>
<th>2021</th>
<th>autonomy_order</th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
</table>

 Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.
Work-related changes during the COVID-19 pandemic: Exploring longitudinal data from the European Working Conditions Survey

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>autonomy_method</td>
<td>148</td>
<td>21</td>
</tr>
<tr>
<td>autonomy_speed</td>
<td>224</td>
<td>26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>autonomy_method</td>
<td>119</td>
<td>25</td>
</tr>
<tr>
<td>autonomy_speed</td>
<td>157</td>
<td>41</td>
</tr>
</tbody>
</table>

Source: Eurofound, EWCS CATI Recall 2021

Figure 16 Skills and discretion index - change, % of respondents

For 81% of respondents there was no change in their index level, for 10% it slipped from a higher level to a lower one, while for 9% it climbed to a better level. When considering persistence, 71% of the respondents were and remained in a good job quality situation relative to their skills and discretion, 10% remained in poor job quality.

The skills and discretion index across occupations remained stable for at least 70% to 90% of respondents across occupations. The three occupations with the highest share of deterioration, that is getting worse in 2021, are respondents who are managers (11%), and workers in elementary occupations (14%). Overall, respondents who in managers, professionals, technicians, and clerks roles are more likely to have experience good job quality in both years. This is not surprising since for the dimension of skills and discretion these occupations usually score higher than the rest.

Source: Eurofound, EWCS CATI Recall 2021
Figure 17 Skills and discretion - change by occupation, % of respondents

Source: Eurofound, EWCS CATI Recall 2021

Work intensity

Work pressure is measured with the request to work at high speed and to work to tight deadlines. Around 17% of the respondents did not report having to work at high speed in 2020 nor in 2021, but 23% reported it in both years. Another 20% of the respondents 2021 reported an improvement in the frequency with which they had to work at high speed, and 34%, reported an increase. For 6% it remained stable.

Figure 18 Working at high speed in 2020 and 2021, % of respondents

Source: Eurofound, EWCS CATI Recall 2021

For the other components of work pressures, working against tight deadlines, 15% of the respondents reported not experiencing any in 2020 nor in 2021, 27% reported it both years, while it improved for 21% of the respondents and worsened for 34%.
Figure 19 Working to tight deadlines in 2020 and 2021, % of respondents

Similar to the other indexes, the number of respondents who remained in the same situation in relation to work intensity, i.e. in the same category, in both years, amounts to 81%. Negative change occurred to 10% of the respondents, while 9% experienced an improvement. More in detail, 71% respondents maintained a good level of work intensity in their jobs, 10% remained at a poor level, and 10% reported a deterioration of the intensity. For 9% the intensity improved from 2020 to 2021.

Figure 20 Work intensity index by occupation, % of respondents

Working time

Working time is an important dimension of job quality because it measures the incidence of long working hours, the scope to take a break, the presence of atypical working hours, the type of working time arrangements and time flexibility in a job. The questions about working during one’s free time and working at short notice were both asked on a five items scale, while working in shifts was a yes/no question in both years.
Most respondents reported a good level of working time in both 2020 and 2021. For those who scored poorly on the index, working time quality worsened because of more respondents working in their free time (20%) and at short notice (9%). Shift work decreased in the EWCS CATI Recall. The variable ‘night’ was numeric in 2020 and a five items scale in 2021, the 2020 variable has been categorised and normalised for the construction of the index.

In the period from 2020 to 2021, most respondents (88%) did not experience change in their working time quality, for 8% it deteriorated and for 4% it improved. The net change however masks the quality of working time for those in the ‘no change’ category, when examining at which level those respondents were at, the respondents for whom job quality was good are 82%, still a high percentage, while it remained poor for 8%.

For most respondents, the working time index remained at a good level between 2020 and 2021, ranging from 65% for those employed as plant and machine operators to 90% for clerical support workers. Respondents in service and sales occupations had the highest percentage (12%) of workers remaining in poor job quality in this dimension, followed by plant and machine operators (9%) and by managers (7%). Working time quality decreased for 16% of plant and machine operators, and for 10% of respondents employed as services and sales workers, professionals (also 10%), and managers (7%).

Source: Eurofound, EWCS CATI Recall 2021
Figure 22 Working time index by occupation, % of respondents

Prospects
The job prospects index explores the outlook of job holders on possible positive or negative changes. The variable ‘likely to lose your job in the next 6 months’, using a five items scale in both years, shows that in both 2021 and in 2020, 66% of the respondents were confident (‘strongly disagree’, ‘tend to disagree’) that they were not going to lose their jobs. On the other side of the spectrum, 4% of the respondents were fearful about losing their job (‘strongly agree’, ‘tend to agree’).

Figure 23 Perspective of losing one’s job and career prospects, % of respondents

Source: Eurofound, EWCS CATI Recall 2021

Job prospects remained unchanged for 79% of the respondents, while 12% experienced a deterioration, and for 14% prospects improved. Around 6% of the respondents found it likely to lose their job both in 2020 and in 2021, 66%, continued to have a good level in 2021. For career prospects
33% of respondents reported a good outlook but 21% already had poor prospects in 2020 and they remained so in 2021. In terms of respondents’ occupations, those working in elementary occupations, technicians (both 18%) and managers (14%) reported the highest deterioration in their prospects.

**Figure 24 Prospects - change by occupation, % of respondents**

Prospects stayed positive for at least half of the respondents in each occupation with a bigger share of optimistic respondents among craft workers (81%) and plant and machine operators (84%).

*Source: Eurofound, EWCS CATI Recall 2021*
Changes in health, wellbeing and engagement

The CATI recall captures developments in six health related items: Backaches, upper limb pain, lower limb pain, headaches, anxiety, and other health problems. In the 2021 survey, 60% of respondents reported problems with the upper limbs, followed by 53% reporting backache, 51% headaches and 39% problems with the lower limbs. Nearly a third of the respondents reported anxiety.

Figure 25 Reported health problems, % of respondents in 2021

<table>
<thead>
<tr>
<th>Health Issue</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper limbs</td>
<td>60</td>
</tr>
<tr>
<td>Backache</td>
<td>53</td>
</tr>
<tr>
<td>Headaches</td>
<td>51</td>
</tr>
<tr>
<td>Lower limbs</td>
<td>39</td>
</tr>
<tr>
<td>Anxiety</td>
<td>30</td>
</tr>
<tr>
<td>Other health problems</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Eurofound, EWCS CATI Recall 2021

When comparing these replies to those of 2020, it becomes evident that overall, a much larger part of the respondents was affected by health problems at one stage as Fig. 26 illustrates. Red and orange bars represent proportions of respondents that were affected by health problems in 2021 and shows those who were affected in both years (red) and those that reported health problems for the first time in 2021. The yellow bars show the proportion of respondents that improved, reporting health problems in 2020 but not in 2021. This shows that with the panel perspective it can be detected that over the two years of observation, a larger population was affected by health issues than the snapshot of just one year would suggest. For instance, only a fourth of respondents (26%) did not report upper limb problems in both years.
Figure 26 Changes in reported health problems 2020-21, % of respondents

Source: Eurofound, EWCS CATI Recall 2021

Again, this shows that with the replies from two subsequent years by the same respondents, the dynamics of gross change, which remain hidden, when we only focus on net change (Figure 27), are revealed. Net change is only detected for a maximum of 4 percentage points (headaches). We don’t observe net change at all for backaches but see that 29% are affected positively or negatively by gross change. Anxiety and upper limb problems show both negative change of 3 percentage points in the net perspective, but as the gross perspective shows, dynamics are quite different with 31% of respondents changing their replies between 2020 and 2021 as regards upper limbs pain compared to only 23% regarding anxiety issues.

Figure 27 Net changes of reported health problems 2020-21, %

Source: Eurofound, EWCS CATI Recall 2021
EWCS traditionally captures mental wellbeing with five items that build the basis for the well-established WHO5 index (see for a review Topp et al., 2015). Five items are included ranging on a 6-point scale from 6 “All of the time” to 0 “At no time”. The reference time are the last two weeks:

- I have felt cheerful and in good spirits
- I have felt calm and relaxed
- I have felt active and vigorous
- I woke up feeling fresh and rested
- My daily life has been filled with things that interest me

The distribution of the five items in the 2021 round is illustrated in Figure 28. The proportions of respondents replying that they felt that way at least more than half of the time varies between 85% (cheerful) to 66% (rested).

**Figure 28 Items of wellbeing by frequency, % of respondents 2021**

Looking at gross change reveals the dynamics of wellbeing items. Improvements ranged from 25% (I’m doing interesting things) to 35% (I have felt active), while deteriorations ranged from 31% (I have felt active) to 44% (I’m doing interesting things). Positive/negative changes reflect a change in the answering scale of 1 or 2 categories, while very positive/very negative changes represent a leap of at least 3 categories. From a survey methodological point of view, it could be argued that only changes of more than one category should be considered as changes of only one point on the scale could represent noise rather than real changes in the wellbeing of the respondents.

**Source:** Eurofound, EWCS CATI Recall 2021
These dynamics are also reflected in the WHO5 index, based on these items, which ranges from 0 (lowest) to 100 (highest) points. The mean of the index changed from 67.3 to 65.2 a decrease of more than 2 points.

A respondent who scores below 50 points is considered to be at risk of clinical depression (see also Downs et al., 2017). In the perspective of gross-change we observe that 9% of the respondents are at persistent risk of clinical depression, scoring below 50 points in both waves. Another 12% changed their status and entered the risk of clinical depression (their wellbeing deteriorated), while 11% were at risk in 2020 but not in 2021. These changes are, however, gradual and show that a large part of the population is close to the “at-risk-of depression” line. This highlights that risks are gradual (in one year at risk, in another one not at risk) for a broader part of the population. More workers are hence vulnerable than is revealed by cross-sectional point estimates.

Further variables related to wellbeing confirm the above picture of a decrease in wellbeing between the two waves in times of the COVID-19 pandemic. Variables collected were: (i) kept worrying about work, when you were not working, (ii) felt too tired after work to do some of the household jobs, which need to be done and (iii) found it difficult to concentrate on your job because of your family responsibilities. As Fig. 30 shows more respondents deteriorated on these items than improved except for item 3 (tired), which was (more or less) balanced.
Finally, we look at changes in work engagement, defined as a ‘positive, fulfilling, work-related state of mind that is characterized by vigour, dedication and absorption’ (Schaufeli and Salanova, 2007) – the opposite, according to Maslach and Jackson (1981), of the core dimensions of burnout: exhaustion and cynicism and based on three items of questions on workers’ relationship with their work:

1) At work I feel full of energy
2) I am enthusiastic about my job
3) Time flies, when I am working

The questions were asked on a five-point scale (never / rarely / sometimes / most of the time / always). Based on these items an index of work engagement ranging from 0 (lowest) to 100 (highest) was created. Between 2020 and 2021 the mean of the index of all respondents dropped from 74.3 to 72.1 indicating that people became less engaged during the pandemic.

Figure 16 shows changes in the single items of engagement. More respondents had negative change in all three items, but especially as regards “time flies” with 9% recording negative change and 5% positive change.
Figure 31 Changes in items of engagement, % of respondents

Source: Eurofound, EWCS CATI Recall 2021
Concomitant changes

Change never comes alone in real life and especially in times of a worldwide pandemic such as COVID-19. In the CATI recall context change implies a broader alteration in working conditions. It is unlikely that for a worker just one specific condition or aspect of his/her work changes as reflected in a single variable taking a different value in t₁ compared to t₀. Indeed, changes often occur simultaneously across various items as is revealed in this section. Certainly, these bivariate associations must not be interpreted in any way as causal. They rather reflect interdependent changes pointing to a – probably latent (=unobserved in the data) – event such as COVID-19 lying behind these observed changes. Some relationships might, however, be more straightforward. For instance, a deterioration in physical working conditions would probably explain the same development in a health-related variable. For others, this relationship is less clear.

In the following part of the section, we explore simultaneous change in the six job quality indexes and five other variables:

- Job changes (yes/no)
- Health changes (better / worse)
- Wellbeing changes (better / worse)
- Engagement changes (better / worse)
- Working from home (less / more often)

In this section, we discuss the most relevant results observed from the analysis of concomitant changes. The following figures compared different situations, where the job quality of respondents worsened or improved.

Bivariate relationships between changes in job quality and other factors vary across job quality dimensions. However, job change and change in work location appear to have played a powerful role.

**Figure 32 Concomitant changes in job quality and selected indicators, % of respondents**
Particularly the social environment, the physical environment and prospects improved more for people, who changed their job and deteriorated for a higher proportion of those, who remained in the same job. Also, for workers who worked more often from home in 2021, the social environment improved more than for those who worked less often from home. Conversely, working less from home was to a higher extent associated with a deteriorated social environment and especially with a deteriorated physical environment and working time quality, while it did not play much of a role for prospects.

Changes in wellbeing and engagement were related to very similar changes in job quality: however, if wellbeing dropped, also a deteriorated physical environment and drops in the skills and discretion index were more likely, while wellbeing improvements were associated with above average improvements in work intensity and skills and discretion.

Source: Eurofound, EWCS CATI Recall 2021

Reading note: The bars above the horizontal axis represent the percentage of respondents which has improved on the job quality index, while bars below the axis represent deterioration rates.
Which factors benefit changes in job quality?

Once the empirical significance of change is recognised, questions arise on what drives it and whether there are groups whose job quality particularly improved or deteriorated. The previous section illustrated that many changes occurred simultaneously. It is however impossible to identify driving factors when investigating bivariate relationships or their trajectories over time. Usually, a phenomenon is related to several other, often interrelated phenomena. For instance, health, wellbeing and engagement must be expected to have a bidirectional and mutually related relationship with job quality (e.g. van Aerden et al., 2016). Employment prospects appear to depend strongly on formal education and the current position in the job, but the latter may independently exert influence on work intensity or working time quality.

Multivariate regressions can help to understand the genuine contribution/relationship of any single factor and can possibly identify dominant patterns. With the regression method the variation of certain characteristics can be attributed to partial relationships with predictor variables. Therefore, we specify a model including the characteristics, which are thought to partly explain the variation in job quality changes. For simplicity, we disregard interaction effects in this analysis. We hence postulate that all independent variables such as occupation, health and wellbeing are relevant for multiple changes in job quality. The results of this exercise are estimates on the relationship a certain characteristic has with job quality while keeping all other characteristics unchanged (controlling for other factors).

With reference to Till and Eiffe (2010), we specify two models to predict net and gross change in job quality. For each model we compute a so called static and a “dynamic” model. The static model includes only characteristics of one single year as predictors, while the “dynamic” variant includes predictors, which change over time. For the latter, the same type of regression is used. The models include socio-demographic variables such as sex, age, formal education and household composition. We present parameters obtained from multinomial regressions for both models. This method is a simple extension of binary logistic regression that allows for more than two categories (that are not strictly ordered) of the dependent variable. Like binary logistic regression, multinomial logistic regression uses maximum likelihood estimation to evaluate the probability of categorical membership (see Kwak & Clayton-Matthews, 2002).
Specification of models and dependent variables

Overall, two types of gross and net models were computed for an index of overall job quality change as well as for all job quality indicators individually. The dependent variables were computed as follows:

For each job quality indicator for 2020 a threshold was determined differentiating between poor job quality (0) and non-poor or good job quality (1). The decision for the threshold value was based on two considerations: a) the distribution of the index (e.g. the lowest 10-15%) and b) the average level of wellbeing for alternative thresholds (see Box 2 for an example). The same threshold was applied to the job quality index of 2021. Consequently, a net-change indicator capturing transitions (improvements/deteriorations/no change) and a gross-change indicator capturing persistence and change overall (persistent poor JQ/change/persistent good JQ) could be computed.

Box 2 Example: How did we compute the threshold of the physical environment index?

In the figure below, we show the distribution of respondents in the physical environment index and average levels of wellbeing below certain thresholds. The index ranges from 0 to 1 with a right-skewed distribution. Average wellbeing levels were computed for values of the index as follows:

- JQ < 0.4
- 0.4 <= JQ <= 0.59
- 0.6 <= JQ <= -0.89
- 0.9 <= JQ

The steepest increase of wellbeing was found at the threshold of 0.6 below which an accumulated proportion of 19.1% was distributed. We therefore decided to set the threshold for a poor physical environment at that value.

Dependent variables are computed such that for the net model they can take values -1 “deteriorated”, 0 “no change” and 1 “improved”. We run a multinominal regression model, which is typically used for categorical dependent variables. Each category of the dependent variable is compared to the reference category (e.g. “no change”). The dependent gross variable of change can also take three different values, namely 0 “persistent poor job quality” 1 “changed” and 2 “persistent good JQ”.

Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.
The overall job quality indicator of gross change is a sum indicator counting the number of transitions in the six job quality indicators. For instance, if a respondent changed in all six dimensions, the indicator would take a value of 6. If another respondent persisted either in good or poor job quality in both years, she would score 0 points. The distributions of both the net and gross index are illustrated in Figures 33 and 34.

**Figure 33 Distribution of net-change in job quality, % of respondents (n=758)**

![Figure 33](image)

**Source: Eurofound, EWCS CATI Recall 2021**

**Figure 34 Distribution of gross-change in job quality, number of respondents (n=758)**

![Figure 34](image)

**Source: Eurofound, EWCS CATI Recall 2021**

The static model only includes structural predictor variables of one year, whereas the dynamic model further includes five variables of change:

**Time-invariant predictor variables:**
1) Gender
2) Age (five groups)
3) Formal education
4) Household type
5) Household size
6) Self-reported health status
7) Employment status (indefinite, fixed-term, other, self-employed with employees, solo SE)
8) Occupation (10 groups)
9) Level of wellbeing (wellbeing index)
10) Level of engagement (engagement index)

Change predictors:
1) Change of job (yes/no)
2) Change in household size (fewer/equal/more)
3) Change in wellbeing index
4) Change in engagement index
5) Change in the frequency of working from home (less/unchanged/more often)

For comparing the explained variance (robust R2) of each model, we ran OLS regressions on all dependent variables (changes in each of the job quality dimensions). It should be mentioned that for only three (categorical) values (deterioration/no change/improvement and persistence in poor jq/change/persistence in good jq) other methods are to be preferred and are used in the subsequent discussion of results (multinomial logistic regressions). However, for illustrative purposes the fit measure is quite suitable. The variance explained varies across JQ indices and across static and dynamic models. Generally, adding variables of change substantially increases the explained variance.

Figure 35 Variance explained by static and dynamic net and gross models of change (R2 based on robust OLS), %

Source: Eurofound, EWCS CATI Recall 2021
Explaining net change

In order to explain net change in job quality (balance of deteriorations and improvements compared to no change), a series of multinomial logistic regressions was applied.

Focussing on the net-indicator of changes in job quality, we observe only few significant effects in the static model. While the model fit increased with the dynamic variables included, only one of the additional predictors of change was significant. Respondents who changed their job, were more likely to improve their overall job quality.

Predicting changes in the dimensions of job quality

Models were also run for each of the indicators measuring transitions in the six job quality dimensions explored. In the following we only present significant associations and report marginal effects. All results reported refer to the model including dynamic predictors (variables of change).

Socio-demographic predictors:

- Gender (ref. group: men)
- Age groups (ref. group: respondents aged 35-44)
- Formal educational attainment (ref. group: primary/secondary education)
- Household type (ref. group: 2 adults with children)
- Household size

There were no significant differences between men and women in other dimensions of job quality. Significant age effects were only detected for the social environment (younger groups less and older groups more likely to deteriorate compared to the reference group of 35-44) and for the physical environment with the younger age groups (16-34) being more likely to improve and the oldest age group being more likely to deteriorate.

Higher formal education was negatively associated with improvements in skills and discretion and prospects, the reason probably being that most respondents in that group already had good conditions in these dimensions in 2020 and hence couldn’t further improve.

Respondents who are single parents were less likely to report improved job quality in work intensity and working time quality, probably due to problems with childcare, school closures and other issues during the pandemic blurring boundaries between private life and work.

Work-related predictors

- Employment status (ref. group: employees with contracts of indefinite duration)
- Occupation (ref. group: professionals)
- Workplace size (ref. group: 10-59 staff members)
- Working from home (ref. group: never/rarely)
- Wellbeing (Index 0 low -100 high)
- **Work engagement (Index 0 low -100 high)**

Respondents on fixed-term contracts were more likely to report improved working time quality than employees on indefinite contracts, probably due to fewer hours worked during the pandemic. This is also probably linked to a general deterioration in working time quality which affected respondents on indefinite contracts more than those on fixed-term contracts. The latter therefore had – in relative terms – a higher chance to improve in this dimension. Persons on other types of contracts (including apprentices and temporary agency contracts) were less likely to deteriorate in the physical environment and more likely to improve their prospects.

There were several significant occupational effects, the most relevant being that Clerks compared to professional had a lower likelihood to improve their prospects. Craft workers, plant operators and respondents in elementary occupations were more likely to report a worsened physical environment and the latter were also significantly less likely to report improvements in this dimension. Skilled agricultural workers were less likely to report improved work intensity, but also less likely to report drops in skills and discretion and working time quality.

Wellbeing in 2020 was negatively associated with deterioration in the physical environment and work intensity (the higher the wellbeing, the less likely respondents reported worse conditions) with marginal effects of -1.8% and 1.7% respectively for each 10 wellbeing points. Wellbeing was however also negatively associated with improvements in prospects, indicating that respondents with higher levels of wellbeing already had good prospects in 2021.

Engagement levels in 2020: Higher engagement is associated with higher work intensity (ME 1.9% by 10 points) and a lower likelihood of deteriorating in the skills and discretion dimension (ME 1.3% by 10 points). The higher the engagement, however, the less likely a respondent was to improve in the latter dimension (-1.4% by 10 points). The reason for this might be that workers with high engagement levels usually had good conditions in skills and discretion and were hence less likely to improve.

**Dynamic predictors**

- Job change (ref: no change)
- Changes in wellbeing (ref: no change)
- Changes in work engagement (ref: no change)
- Changes in the frequency of working from home (ref: no change)

Job changes were positively associated with improvements in the social environment and in the prospect’s dimensions. An improvement in work engagement was negatively linked to a worsening in the social environment and in skills and discretion. Increased wellbeing was negatively related to higher work intensity and a deterioration in skills and discretion. It was, however, also negatively related to improvements in prospects.

Working less from home was significantly negatively associated with an improvement in the physical environment, meaning that if people went on site more frequently in 2021 than in 2020, then were less likely to improve in this dimension. Working from home more often was on the other side linked to a higher likelihood of improvements in the physical environment.
Explaining gross change

The focus on gross change or total change in job quality can help to reveal the responsiveness or resilience to changes under specific circumstances (such as COVID-19). These aspects remain hidden when only observing net-change (balance of improvements and deteriorations). In this section we introduce the same predictor variables for our model as in the previous section on net change into a multivariate model to predict gross change (either improvement or deterioration). For the sum indicator of gross changes in job quality (7-counts items) we use negative binomial regression, a method that is applied when the dependent variable is a count variable and has a high number of zeros (see Fig. 28). For the dimension indices of change – as in the previous section – multinomial logistic regressions are applied. The dependent variable consists of three categories (persistence in poor JQ / change (deterioration/improvement) / persistence in good JQ) that are not naturally ordered. As mentioned above, the explained variance substantially increases compared to the original model. This means that a multivariate model is more capable of predicting vulnerabilities (interpreted as ‘change’) or resilience than to predict the net balance of improvements and deterioration.

In the following we report the statistically significant results at the 0.05 level of the dynamic model. The base category (to which the other two categories are compared) is persistence in good job quality in each of the dimensions. We report marginal effects which are more intuitive and straightforward in the interpretation than the regression coefficients.

The dynamic model predicting multiple changes in job quality delivers the following significant associations: Compared to respondents aged 35-44, those aged 56 or older were 45% more likely to report change. In terms of occupation technicians (p-level < 0.01) were less likely to report change.
than the reference group of professionals. Respondents, who, in 2020, sometimes worked from home had a 30% lower likelihood to report change than the reference group (rarely or never working from home). Self-employed respondents with employees (-39%) were overall less likely to report change in job quality (p-level < 0.05). The wellbeing level of 2020 is negatively associated with change in job quality at the 0.01 level: 10 points more in wellbeing reduce the likelihood of change in job quality by 8% (p-level < 0.01).

Regarding the dynamic component of the model, the following associations were observed: Strong associations (p-level <0.001) were found for a decrease in wellbeing (+31%) and a changing frequency of working from home: lower frequency of home office increased the likelihood of change by 56%, a higher frequency decreased it by 25%. A job-change tended to increase the likelihood of a change in job quality by 17% (but on the 0.1-level).

**Figure 36 Marginal effects, dynamic predictors of gross change**

![Marginal effects chart](chart.png)

**Level of significance:** *** p<0.01, ** p<0.05, * p<0.1 Reference population: those who reported no change

The base category for the multinomial regression s following (to which the other two categories are compared) is persistence in good job quality in each of the dimensions.

**Social environment:** Respondents aged 56 and over (compared to 35-44) were more likely to experience change in this dimension. Change in this dimension was also more likely for agricultural workers compared to professionals. The higher the reported wellbeing was in 2020, the less likely respondents either persisted in a poor social environment or reported change. Work engagement of 2020 was also negatively associated with persistence. For respondents who reported an increase in work engagement, persistence in a poor social environment was less likely than for those who did not report changes in engagement.

**Physical environment:** Service workers, agricultural workers and blue-collar workers were significantly more likely compared to professionals to persist in poor job quality in this dimension. Respondents in elementary occupations were more likely to report change (ME +17%). Workplace size also played a role: the bigger the workplace, the more likely respondents were to report change (ME of workplace 250+ was 11% compared to 10-49 staff). Respondents who worked sometimes from home in 2020 were less likely to persist in poor job quality (ME -7.2%) or to report change at all in this
dimension (ME -9.2%). Reported wellbeing in 2020 was negatively associated with persistence in a poor physical environment and with change overall.

A higher frequency of working from home in 2021 was negatively associated with both persistence (ME -3.6%) and change in the dimension (ME -8.5%), while a lower frequency was positively associated with change. Respondents with increased wellbeing were less likely to report persistence in a poor physical environment than those with stable wellbeing levels.

**Work intensity:** Younger respondents (25-34) were more likely to report change in work intensity than the reference group of 35-44. The higher the formal education, the more likely respondents were to remain at high levels of work intensity (ME 7%). Compared to professionals, plant operators were more likely to remain at high levels of work intensity (ME 15.4%), while workers in elementary occupations were less likely to report change overall in the dimension (ME -12.9%). Wellbeing in 2020 was negatively associated with both persistently high work intensity and change in the dimension, while engagement levels were positively linked to reported change.

An increase in wellbeing made persisting high work intensity less likely, while a decrease was significantly related to changes in work intensity. This means that deteriorated wellbeing is related to overall changes in work intensity, but probably more to increases in work intensity than decreases.

**Skills and discretion:** Women were more likely than men to report change in this dimension (ME 5.9%). Respondents aged 25-34 and 45-55 were both less likely to report change (ME -7.5% and -8.6% respectively). Both age groups <25 and 25-34 were more likely to persist in poor job quality (ME -5.1% and -7.6% respectively) compared to those aged 35-45.

Respondents with tertiary education were less likely to report change (ME -5.8%) than those with lower education. In terms of occupation, plant operators (ME 11.9%) and respondents in elementary occupations (ME 12.6%) had a significant higher likelihood of persisting with poor skills and discretion. Self-employed with employees were least likely to either persist in poor conditions (ME -9.5%) or to report change at all (-20%) compared to respondents who are employees with permanent contracts. Most likely as they are traditionally scoring very well in the skills and discretion index. Respondents who already worked from home often or always in 2020, had a lower likelihood to remain in poor job quality (ME -11%) in this dimension.

Both work engagement and wellbeing were negatively associated with either persistence or change in this dimension.

Regarding the dynamic component, respondents with increased engagement in 2021 were less likely to report persistence or overall change in this dimension. Working from home more often was negatively associated with persistence or overall change in this dimension (ME -6%).

**Working time quality:** Self-employed with employees were significantly less likely than employees with permanent contracts to persist with poor working time quality (both ME -5.7%). Agricultural workers were less likely to remain in poor working time quality compared to professionals. Respondents who often or always worked from home in 2020, were less likely to remain in poor working time quality than those who never worked from home. Wellbeing levels in 2020 were negatively associated with persistence in poor working time quality.

Working from home less often in 2021 than the year before was associated with a higher likelihood of persisting in poor working time quality (ME 17.2%) and reported overall change in this dimension (ME
A higher frequency of working from home was, on the other hand, associated with a lower likelihood of persistence (-5.1%) and change overall (ME -5.3%).

**Prospects:** Respondents with tertiary education were less likely to experience change in this dimension (ME -5.4%). Respondents with poor health were more likely to persist with poor prospects compared to those with very good or good self-perceived health status. In terms of occupations, persistence in poor job prospects was more probable for service workers (ME 8.7%), craft workers (12.1%) and those in elementary occupations (ME 11.7%) compared to professionals, while clerks were overall less likely to report change in this dimension (ME -16.4%).

Workers in large organisations with 250 or more employees were less likely to report change than those in smaller organisations (10-49 staff) (ME -12.6%). Both wellbeing and work engagement levels of 2020 were negatively associated with change in prospects and the latter also negatively linked to persistence in poor prospects. Workers who reported a decrease in engagement were, on the other hand, more likely to persist in poor job prospects.

**Table 5 Coefficients of change variables on changing job quality (deterioration / improvement) – dynamic model of gross change**

<table>
<thead>
<tr>
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<th>Social environm.</th>
<th>Physical environm.</th>
<th>Work intensity</th>
<th>Skills and discretion</th>
<th>Working time quality</th>
<th>Prospects</th>
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*Level of significance:* *** p<0.01, ** p<0.05, * p<0.1 Reference population: Those with persistently good JQ

**Reading note:** Signs in the cells indicate positive or negative effects from multinomial logistic regressions on the dependent variables (coefficients for persistent poor job quality / change in job quality). For instance, a job change is positively associated with a change in the social environment. Working from home more often is negatively associated with persistent poor job quality in skills and discretion
Concluding remarks

Answering questions on the nature of job quality dynamics requires a longitudinal database, which captures relationships between different elements of the process and allows to understand the medium-term impact on health and wellbeing. The EWCS was originally not designed for that purpose. However, the experiment following up with respondents from the interrupted EWCS 2020 via telephone interviews in 2021 delivered such a dataset on which transitional analyses of job quality could be performed. Although the quality of the data set in terms of capturing change is difficult to assess (due to mode and other effects), the exercise has shown the potential of the value of longitudinal data and how to analyse change. Investing in the collection of longitudinal data could provide precious insights in the development of working conditions and job quality. A representative sample of longitudinal data would allow to generalise findings that in this paper, regrettably, can only be valid for respondents due to sample size. Information about jobs, health and wellbeing, burnout, the change of location of work in exceptional circumstances such as the pandemic, are all important aspects of building and informing policy for a better Europe.

Special thought is required to recognise the specific problems of longitudinal analysis. This working paper set out from a dynamic, multidimensional framework for job quality. Purely cross-sectional indicators appear inadequate for monitoring change appropriately. They conceal workers’ turnover and transitions, and with it the changes that policies must fundamentally address.

The analysis has broadly illustrated – like other research before – that changes usually do not occur in isolation but simultaneously with other changes\(^5\). Change implies a broader alteration of working and/or living conditions. Many of these concomitant changes remain significant even after controlling for other potential influence factors, especially in the models predicting gross change.

The observed relationships were more systematically tested in a multivariate statistical model of change. The model of net change confirmed that dynamics in other variables were significant for improvements or deteriorations in various job quality indices. Gross change models (predicting overall change), however, appeared to be more responsive and predictor variables were able to explain a higher proportion of variance than the models of net change. Wellbeing and engagement (and changes over time) and changes in the frequency of working from home appeared to be powerful predictors of changes in job quality.

On a broader and more comprehensive data basis, such models could be used to predict specific propensities for vulnerabilities with certain groups of workers. Our analysis was based only on a small data set from only two subsequent waves. Based on longer periods of observation, sequences of events and their positive or negative consequences for job quality could be analysed more thoroughly. More advanced statistical modelling such as structural equation models or standard random or fixed effects models could be applied allowing for a more comprehensive testing of hypothesis. Latent class

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\(^5\) For the specific exercise here, it cannot be ruled out that the reason that we find the co-occurrence of change is that certain people are more susceptible to mode effects than others.
analysis could help identify recurrent patterns and scrutinise the extent of oscillation of precarious positions.

Some pointers for future projects

- **Mode, scale and other effects should be addressed**: the telephone survey in 2021 was shorter than the 2020 face to face survey, implying apart from mode effects different replies due to different order and context of questions. All working conditions variables should ideally be collected at both time points for all respondents, those who changed job and those who stayed in the same jobs. Scales should be identical to improve comparability and limit scale effects.

- **Data preparation**: where variables were identical in both years, coding just needs to be replicated but it takes longer where scales or the variable type (numerical, categorical) was different between years. This also imposes sever restrictions on comparability over time (see previous bullet point). A helpful way of naming variables, that is using the same name in 2021 but appending a suffix (RC in this case) helped to reduce searching time when coding. Further data preparation was done to create the ‘change’ variables and the ‘job quality indexes’ variables.

- **Variables**: A change variable was calculated for each of the questionnaire items used in this paper; where no change took place it is coded zero, while improvement and deterioration took positive and negative values respectively. The negative values always reflect a bad condition for the worker so variables might need recoding to ensure consistency.

- **Job quality items**: The preparation of the variables for the job quality indexes was challenging since not all the variables traditionally used to compute these indices were available for both years; therefore, the resulting indices are ‘slim’ versions and have more of an illustrative value instead of being a full picture of respondents’ job quality in each of the dimensions.
Work-related changes during the COVID-19 pandemic: Exploring longitudinal data from the European Working Conditions Survey

References

All Eurofound publications are available at [www.eurofound.europa.eu](http://www.eurofound.europa.eu)


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**WPEF22047**
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