

PEER REVIEW HISTORY

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ARTICLE DETAILS

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| TITLE (PROVISIONAL) | Adjusting working conditions and evaluating the risk of infection during the COVID-19 pandemic in different work-place settings in Germany – a study protocol for an explorative modular mixed methods approach |
| AUTHORS | Rind, Esther; Kimpel, Klaus; Preiser, Christine; Papenfuss, Falko; Wagner, Anke; Alsyte, Karina; Siegel, Achim; Klink, Antje; Steinhilber, Benjamin; Kauderer, Johanna; Rieger, Monika A. |

VERSION 1 – REVIEW

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| REVIEWER | Sean Semple University of Stirling, Scotland |
| REVIEW RETURNED | 27-Aug-2020 |

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| GENERAL COMMENTS | <p>This manuscript is the description of a protocol for a planned study on the risk of Covid-19 infection in different work settings. It is generally well written and gives a clear description of the planned methodology. I have only a small number of minor suggestions for the authors.</p> <p>Study aims/research question #2 refers to the 'new normal'. This concept is not explained in the introduction. While I accept that this is a well understood term currently, I would want the manuscript to be understood in years to come – please make sure this terminology is explained.</p> <p>The study aims relate to gathering data from workers and worksites in Germany. This should be stated explicitly. It is not an international study and the findings from Germany may not be translatable to other countries. The discussion (line 420) makes the assertion that the findings will be transferable to other companies but I would like to see some discussion about how working cultures in other countries (e.g. around the use of PPE, importance and presence of occupational health services etc) may impact on how useful the findings will be in other jurisdictions. It may be worth modifying the title to make it clear the study is looking at workplace settings in Germany.</p> <p>Line 328 – OCR abbreviation not defined.</p> |
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| REVIEWER | Evangelia Demou University of Glasgow, UK |
| REVIEW RETURNED | 18-Sep-2020 |

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| GENERAL COMMENTS | This is a very interesting project and much needed as COVID-19 restrictions have been easing and more and more people are |
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| | <p>returning to work. Furthermore, the current increase in cases across Europe means that the 'new normal' in working conditions is actually unknown and possibly fluid for a number of sectors. Having a multi and mixed methods approach, considering a range of stakeholders across the organisation and employees, as well as policies and practices in place is very much needed.</p> <p>While I appreciate this is a method designed to be implemented across organisations and sectors, it would be good to know a bit more about the type of company that is already recruited.</p> <p>There are some issues with the language, which I think have contributed to certain sections not being clear or consistent throughout the paper.</p> <p>It is not clear from the methods section, if within this study the IASV team are planning to conduct the research in the one company or to 'other companies, institutions and public authorities'. This confusion may be a language issue but it should be made clear. (top of page 8).</p> <p>Page 8: "...how different attitudes and behaviours may impact their perceived and measured risk of infection.". This read as if you expect the difference in perceived and measured (more importantly) risk of infection is only down to attitudes and behaviours and not to policies and practices put in place (or lack of them). Is this the case?</p> <p>Why are the employee surveys (T0, T1, T2, T3) timed in this manner? Some justification should be provided.</p> <p>Page 10-line 237: are the authors talking about 'perception of infection' or rather 'perception of infection risk'?</p> <p>Page 11-line 285: can you explain the purpose and how confidentiality will be protected if "Several mutual data analysis sessions with the partners from the company are planned." This is important especially as the authors highlight one limitation may be participant fear that the data can/may be used by the company and have negative effects on them as employees. Also this is not in line with your Disclaimer statement.</p> <p>Typo Table 2 (page 13) should be Table 1</p> <p>Page 13: Table 1, how will you assess "work-related stress and strain beforethe COVID-19 pandemic concerning work content/task,..."</p> <p>Page 13: Table 1, considering the increased risk to BAME groups, why are you not collecting any information on ethnicity?</p> <p>Module 4: will the same 8-digit code generated during the online survey be used? – how will the seroprevalence testing results be analysed in combination with other module outputs?</p> <p>Module 1 needs to be described better; in many instances it is referring to federal and regional regulations and not company level data on the policies, processes and procedure they have implemented (which I gather is what the authors are actually proposing on doing).</p> |
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VERSION 1 – AUTHOR RESPONSE

Dear Reviewer 1,

Thank you very much for your valuable feedback. We carefully considered your comments and suggestions. The changes made in the manuscript are in blue. Please find below a point by point response to your comments and suggestions:

| No | Reviewer's comment | Response to reviewer | Changes in the manuscript |
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| 1 | <p>Study aims/research question</p> <p>#2 refers to the 'new normal'. This concept is not explained in the introduction. While I accept that this is a well understood term currently, I would want the manuscript to be understood in years to come – please make sure this terminology is explained.</p> | <p>Thank you for this comment. We explained the terminology in the Introduction section.</p> | <p>Introduction section, page 4, line 111-115:</p> <p>The term “new normal” arose, meaning that as long as there will be no vaccination for SARS-CoV-2 and no effective treatment, the state of exception will last, including implementation of and adherence to strict hygiene measures, as well as social and physical distancing in private life and workplaces for individual and collective protection.</p> |
| 2 | <p>The study aims relate to gathering data from workers and worksites in Germany. This should be stated explicitly. It is not an international study and the findings from Germany may</p> | <p>Thank you for this comment. We added this aspect in the Introduction section. We also added the aspect of a lack of transferability to the discussion.</p> | <p>Introduction section, page 5, line 133-143:</p> <p>See revised Introduction section.</p> <p>Discussion section, page 15, line 448-450:</p> <p>However, this is not an international study. Therefore, the gained results from Germany may not be translatable to other countries.</p> |

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| | not be translatable to other countries. | | |
| 3 | <p>The discussion (line 420) makes the assertion that the findings will be transferable to other companies but I would like to see some discussion about how working cultures in other countries (e.g. around the use of PPE, importance and presence of occupational health services etc) may impact on how useful the findings will be in other jurisdictions.</p> | <p>Thank you for your remark. Based on your suggestion, we specified that the results will be transferable to other companies in Germany. Since the incidence of infection currently differs greatly from country to country, we only focus on the situation in Germany.</p> | <p>Discussion section, page 15, line 447f.:</p> <p>Furthermore, the design is transferable to other companies, institutions and public authorities in Germany.</p> |
| 4 | It may be worth modifying the | Thank you for this remark. According to you | See modified title on page 1 |

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| | title to make it clear the study is looking at workplace settings in Germany. | suggestion, we changed the title. | |
| 5 | Line 328 – OCR abbreviation not defined. | Thank you. Corrected according to the suggestion. | <p>Methods and Analysis section, page 12, line 353f.:</p> <p>In case of a paper-pencil questionnaire, each survey</p> |

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| | | sheet will be scanned at the University Hospital Tuebingen using an Optical Character Recognition (OCR) system. ³⁹ |
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Dear Reviewer 2,

Thank you very much for your valuable feedback. We carefully considered your comments and suggestions. The changes made in the manuscript are in blue. Please find below a point by point response to your comments and suggestions:

| No | Reviewer's comment | Response to reviewer | Changes in the manuscript |
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| 1 | While I appreciate this is a method designed to be implemented across organisations and sectors, it would be good to know a bit more about the type of company that is already recruited. | Thank you for this remark. We added more information about the recruited company in the Method section. | Methods and Analysis section, page 6, line 163-168: Modules 1 – 3 will be carried out in a large German leading global supplier of technology and services. The company employs roughly 400,000 associates in approximately 60 countries worldwide, thereof 132,000 in Germany in more than 100 locations where employees pursue a variety of professional activities differing in their work-related risk of infection with SARS-CoV-2. |
| 2 | There are some issues with the language, which I think have contributed to certain sections | Thank you. We added one sentence explaining that the complete approach is tested and evaluated in one company. | Methods and Analysis section, page 6, line 162-163: The complete explorative multi-modular approach is |

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| | <p>not being clear or consistent throughout the paper. It is not clear from the methods section, if within this study the IASV team are planning to conduct the research in the one company or to 'other companies, institutions and public authorities'. This confusion may be a language issue but it should be made clear. (top of page 8).</p> | | <p>initially tested and evaluated in one company.</p> |
| 3 | <p>Page 8: "...how different attitudes and behaviours may impact their perceived and measured risk of infection.". This read as if you expect the difference in perceived and</p> | <p>Thank you for this comment. We are aware that our research subject is very complex, and different ways of approaching are therefore needed. So, we will record attitudes and behaviour of employees in module 3. The results from module 3 are combined with the</p> | <p>No changes.</p> |
| | <p>measured (more importantly) risk of infection is only down to attitudes and behaviours and</p> | <p>results of the document analysis of legal policies and practices concerning dealing with SARS-CoV-2 (module 1), and the additional</p> | |

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| | not to policies and practices put in place (or lack of them). Is this the case? | seroprevalence measurements (module 4). | |
| 4 | Why are the employee surveys (T0, T1, T2, T3) timed in this manner? Some justification should be provided. | Thank you for this comment. We have updated our procedure in the meantime. The surveys of module 3 take place in the same time as the seroprevalence testing in module 4. We reduced the number of surveys to three waves in agreement with the responsible persons in the company. We also added a justification for our approach. | <p>Methods and Analysis section, page 7:</p> <p>See updated table 1.</p> <p>Methods and Analysis section, page 10, line 319-322:</p> <p>T0 allows to capture the initial status in summer/autumn 2020 in Germany. T1 will cover the winter months, while T2 will again be carried out in summer 2021. This approach makes it possible to identify different phases and probably also peaks during the ongoing COVID-19 pandemic.</p> |
| 5 | Page 10-line 237: are the authors talking about 'perception of infection' or rather 'perception of infection risk'? | Thank you for this comment. We meant perception of infection risk. | <p>Methods and Analysis section, page 8, line 245-247:</p> <p>To capture potential regional and activity-related differences in the occupational risk and perception of infection risk, purposive sampling²⁴ will be used to include about six different company sites of the initially participating company.</p> |

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| 6 | <p>Page 11-line 285: can you explain the purpose and how confidentiality will be protected if “Several mutual data analysis sessions with the partners from the company are planned.” This is important especially as the authors highlight one limitation may be participant fear that the data can/may be used by the company and have negative effects on them as employees. Also this is not in line with your Disclaimer statement.</p> | <p>We intended this as a form of member check for quality control and have refrained from this idea. We will present preliminary results to our project partners, but will not go into the details of individual data. We included the opportunity for interviewees to re-read their interviews and comment on potentially risky sections.</p> | <p>Methods and Analysis section, page 9-10, line 296-304:</p> <p>Interviewees will have the opportunity to re-read their interviews and give feedback on passages they consider as risky. The data will be imported into MAXQDA, and analysis will be carried out by two researchers of the IASV following the steps of qualitative content analysis, including the development of a coding frame, the segmentation of the material, the testing of the coding frame, the evaluation of the trial coding and the completion of the main coding. Preliminary results will be presented to further members of the study team to discuss remaining open questions and ensure quality control. All data will</p> |
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| | | | remain at the IASV. |
| 7 | <p>Typo Table 2 (page 13) should be Table 1</p> | Corrected according the suggestion. | Methods and Analysis section, page 7, line 207. |
| 8 | <p>Page 13: Table 1, how will you assess “work-related stress and</p> | <p>We rely on the theoretical framework of the GDA (GDA, 2014. Recommendations of the</p> | No changes. |

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| | <p>strain<u> before</u> the</p> <p>COVID-19 pandemic concerning</p> <p>work content/task,..."</p> | <p>institutions of the Joint German Occupational</p> <p>Safety and HealthStrategy (GDA) for</p> <p>impleme psychos ris assessm nting ocial k ent.</p> <p>Management of the GDA Mental Health</p> <p>Working Programme, Berlin.). We used and</p> <p>adapted single items from a recent survey by</p> <p>the Institute for Occupational Medicine,</p> <p>Prevention and Corporate Health Management</p> <p>in Lübeck on work and health in times of the</p> <p>coronavir pandemic. asked us We the</p> <p>participants to evaluate each item based on</p> <p>how it was before the pandemic and how it is</p> <p>currently during the pandemic. The individual</p> <p>items will be combined into a mean value</p> <p>score and cover each dimension of the</p> <p>framework of the GDA.</p> | |
| 9 | <p>Page 13: Table 1, considering</p> <p>the increased risk to BAME</p> <p>groups, why are you not</p> | <p>Thank you for this remark. Our focus lies on</p> <p>the participants' experiences and attitudes</p> <p>towards working conditions during the COVID-</p> | <p>No changes.</p> |

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| | <p>collecting any information on ethnicity?</p> | <p>19 pandemic as well as their perceived risk of infection at the workplace and outside the working environment in Germany.</p> <p>In the first wave of our survey, we focussed on some risk factors (e.g. number of children, residence, contact to risk groups, leisure activities, attendance of children in day-care centers or schools, relevant underlying medical conditions, work in changing teams)</p> <p>We are aware that especially BAME groups have an increased risk of infection with the SARS-CoV-2 virus. One recent review confirmed this (Public Health England: Beyond</p> | |
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| | | <p>the data: Understanding the impact of COVID-19 on BAME groups, June 2020).</p> <p>Nevertheless, the concept of ethnicity and race differ between the British and the German context. In the German context, race and</p> | |
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| | | <p>ethnicity have a rather biological connotation</p> <p>and are thus highly charged terms due to the</p> <p>German history. This has among other things</p> <p>the effect, that there are no developed items to</p> <p>ask about race and ethnicity as socially</p> <p>constructed concepts. In many studies, this is</p> <p>solved by asking about migration background</p> <p>(defined as being born or one parent being</p> <p>born abroad). As this has been currently</p> <p>contested in academic and public discourse,</p> <p>we decided to refrain from this concept, too,</p> <p>and focus on the above mentioned risk factors</p> <p>as most relevant dimensions. Therefore, we</p> <p>would like to discuss in our team whether we</p> <p>should take up the aspect of ethnicity in the</p> <p>following two waves of the survey.</p> | |
| 10 | <p>Module 4: will the same 8-digit code generated during the online survey be used? – how will the seroprevalence testing</p> | <p>Yes. The data can be matched with the</p> <p>questionnaire data from module 3 using the</p> <p>code. Based on age, gender and job profile, it</p> <p>can be checked whether there are differences</p> | <p>Methods and Analysis section, page 12, line 347-</p> <p>350:</p> <p>At the end of the first survey wave, participants will be</p> <p>asked to generate an 8-digit code which will be the</p> |

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| | <p>results be analysed in combination with other module outputs?</p> | <p>in the two samples (sample module 3 vs. module 4). More exact suitable analysis strategies will be planned with the biometrician.</p> | <p>same for all survey waves and can be used to merge the data of each person anonymously over subsequent survey waves.³⁷ Participants can (but do not have to) provide the result of the seroprevalence testing to the questionnaire.</p> |
| 11 | <p>Module 1 needs to be described better; in many instances it is referring to federal and regional regulations and not company level data on the policies, processes and procedure they have implemented (which I gather is what the authors are actually proposing on doing).</p> | <p>Thank you for the remark. We now explain module 1 in more detail in the revised section.</p> | <p>Methods and Analysis section, page 8-9, line 252-259:</p> <p>Module 1 is a continuous literature search and document analysis. The objective is to present workplace-related, legal, infectiological and social conditions facing companies in the context of the COVID-19 pandemic following the first lockdown in Germany. of Three researchers from the IASV analyse and discuss prevailing federal and regional laws (e.g., from the Federal Ministry of Health and from the Federal Ministry of Labour and Social Affairs), the development of infection rates in Germany (e.g., from the Robert Koch Institute), and occupational health and safety and infection control regulations at the respective sites of the participating companies.</p> |

VERSION 2 – REVIEW

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| REVIEWER | Sean Semple University of Stirling, Scotland |
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| REVIEW RETURNED | 20-Oct-2020 |
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| GENERAL COMMENTS | Thank you for making the revisions requested and providing clear responses to facilitate re-review. I am satisfied that you have addressed my previous points. |
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