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Do more inclusive workplaces lead to more innovation? Evidence from survey data for firms in England

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EXECUTIVE SUMMARY

Although the productivity benefits of more inclusive and diverse workplaces have been widely discussed, there is less evidence on the links between inclusivity and innovation. In this report, drawing on pre-existing data for a large sample of firms across the East and West Midlands of England, we consider three research questions:

- Is workforce diversity positively related to innovation outcomes?
- How do high performance work practices, such as job variety, flexibility, and communication, contribute to innovation outcomes; and,
- How do workplace practices to support good mental health and well-being among employees contribute to innovation?

Key findings

Our results suggest that building a more inclusive workplace is strongly associated with higher levels of innovation activity. Based on Probit and treatment effects models, our analysis suggests three key results:

- Greater workforce diversity in terms of gender, ethnicity and disability is positively associated with an increase in the propensity to undertake product and process innovation;
- Providing flexible working is positively associated with an increase in the propensity to undertake product innovation;
- Taking measures to support employee mental health and well-being are strongly associated with both product and process innovation.

Looking across the population of firms in the East and West Midlands, however, we see that ethnic diversity is more limited in smaller firms suggesting that these companies might be missing out on some of the innovation advantages of diversity. Implementation of practices to support employee mental health and well-being is also notably less common in smaller firms suggesting again that these firms may be missing out on the potential innovation advantages of such measures.

Implications

In policy terms our results on the innovation benefits of building an inclusive workplace provide strong support for measures designed to promote employment diversity (by gender, ethnicity and disability), flexible working, and the implementation of practices to support employee mental health and well-being. In a number of cases – ethnic diversity, mental health and well-being practices – aspects of more inclusive workplaces are, however, less well represented in smaller firms. Smaller firms may therefore provide a focus for targeted measures designed to promote understanding of the benefits of workforce diversity and how to support employee good mental health and well-being. Any such measures need to be easy to access and deliver, however, given the lack of leadership resources which typify most small firms.

SECTION 1: INTRODUCTION

Although the productivity benefits of more inclusive and diverse workplaces have been widely discussed, there is less evidence on the links between inclusivity and innovation. In this report, drawing on data for a large sample of firms across the East and West Midlands of England, our aim is to explore the relationship between inclusive workplaces and innovation outcomes. More specifically we consider three research questions:

- Is workforce diversity positively related to innovation outcomes?
- How do high performance work practices, such as job variety, flexibility, and communication, contribute to innovation outcomes; and,
- How do workplace practices to support good mental health and well-being among employees contribute to innovation?

Although based on a single cross-sectional survey, and therefore providing evidence of correlation rather than causality, our results emphasise the strong link between workforce diversity and innovation outcomes, the role of flexibility in supporting innovation, and strong links between the adoption of mental health and well-being practises and innovation outcomes. This enriches the standard argument for inclusivity which relates primarily to its productivity benefits, also suggesting that building an inclusive workplace can significantly enhance innovation outcomes.

The remainder of the report is organised as follows:

- Section 2 provides an overview of the existing evidence on workforce diversity high performance work practises, mental health and well-being practises and innovation. Conceptual arguments about the benefits and disbenefits of inclusivity often generate ambiguous implications. However, previous empirical studies tend to suggest the positive benefits of inclusivity for business performance.
- Section 3 details data and methods used in our analysis. Here we combine simple Probit models to establish the innovation effects of workforce diversity and high-performance work practises including flexibility, with treatment effects analysis to establish the innovation effects of mental health and well-being practises.
- Section 4 outlines our key empirical results, which are summarised in Section 5. Section 5 also briefly considers the implications of our analysis for policy development focusing on the more limited adoption of inclusive practises in smaller companies.

SECTION 2: INCLUSIVE WORKPLACES AND INNOVATION

2.1 Introduction

In this Section we provide a brief review of the prior evidence related to inclusive workplaces and innovation. The related literatures draw on material from human resources, management and occupational psychology and the review is intended to be selective rather than comprehensive. The aim is to identify key lines of argument in the literature and suggest the rationale for the inclusion of variables in the later empirical analysis. Three themes are discussed as part of an inclusive workplace: workforce diversity, work organisation and high-performance working, and workplace mental health and well-being practices.

2.2 Workforce diversity and innovation

Conceptual thinking on the value of diversity for innovation is mixed, suggesting the potential for either positive or negative effects on performance. As Harrison and Klein (2007, p. 1191) suggest 'Theories predict differing effects of such differences— that they will spark integrative insights, creativity, and innovation, or that they will provoke conflict, division, and dissolution'. They suggest conceptualisations of diversity fall into three main groups:

- **Similarity attraction frameworks** which suggest that attribute diversity limits social and behavioural commonality and may foster communication issues and conflict and reduce cohesion and performance (Montoya and Horton, 2013).
- **Cognitive frameworks** which emphasise the value of varied knowledge, ideas and approaches boosting creativity and the quality of innovations (Mello and Rentsch, 2015). Cognitive diversity may also lead to conflict and disagreement, however, and may therefore be negative where conflict resolution mechanisms are weak (Martins *et al.*, 2013).
- **Status characteristic approaches** or stratification status frameworks which emphasise individuals' inter-personal comparisons which may generate (negative) biases or dissent (Oxoby, 2002), and/or (positive) internal competition (Loch, Huberman and Stout, 2000).

Empirical studies tend to focus on single dimensions of workforce diversity although (Østergaard, Bram and Kari, 2009) use data from matched employee-employer data for Danish firms to examine the impact on innovation of gender, age, ethnicity and educational diversity among the workforce. They find that gender diversity has a strong effect on the propensity to innovate, i.e. 'the most balanced firms (50-60% of same gender) are almost twice as likely to innovate compared to the most concentrated firms (90-100% of same gender)' (Østergaard, Bram and Kari, 2009), p. 13). They find that educational diversity also contributes to higher innovation propensity, but age diversity impacts negatively on innovation propensity, while ethnic diversity has no significant effect. Other studies focusing on gender diversity reflect this evidence, typically identifying a positive effect on innovation outcomes. For example, (Teruel, Parra and Blasco, 2015) find a positive relationship between gender diversity in firms' R&D teams and overall workforce and innovation outcomes in Spanish firms, an effect which is larger in larger teams. Following Díaz-García *et al.* (2013)., Teruel *et al.*

2015 use the Blau index to measure gender diversity in the firms' workforce and the R&D team. (Wikhamn and Wikhamn, 2020), also using the Blau index to reflect gender diversity in Swedish R&D teams, found a non-linear relationship between R&D outcomes and team gender composition. Here, higher levels of diversity were associated with the highest level of R&D outcomes. Díaz-García, González-Moreno and Sáez-Martínez (2013), also using the Blau index to measure diversity in Spanish R&D teams, found that gender diversity in R&D teams can lead to increased innovative performance and radical innovation (measured by whether an innovation is 'new to market'). Ritter-Hayashi, Vermeulen and Knoblen (2019) further support this, finding that gender diversity in firms' leadership teams and workforces, again measured by the Blau index, positively impacts innovation in developing countries, particularly in the presence of women's economic opportunity.

Although Østergaard, Bram and Kari (2009, p. 13) found no innovation benefit from ethnic workforce diversity in Denmark, other studies do find positive effects. Using a sample of 3,888 Swedish firms Mohammadi, Broström and Franzoni (2017) find that greater ethnic diversity (defined by country of birth) and diversity in educational disciplinary background is positively correlated with sales from radical innovations (Verma, 2020). Parrotta, Pozzoli and Pytlikova (2014) use matched employer-employee data along with matched patent data for Danish firms to demonstrate that greater ethnic diversity in the workforce (measured by a Herfindahl index) is associated with increased numbers of patent applications, patent complexity and patent diversity. This is further supported by Richard *et al.*, (2003), working with data on a sample of US banks, found that racial diversity can enhance performance where firms are pursuing an innovation strategy.

More recently in the light of aging workforces in many firms, the focus has shifted to age diversity which may also enhance innovation by bringing together a range of different perspectives (Pitt-Catsouphes, Mirvis and Berzin, 2013). Empirical evidence is mixed, with Østergaard, Bram and Kari (2009) finding that age diversity impacted negatively on innovation propensity in Danish firms, while Mothe and Nguyen-Thi (2021) use matched employer-employee data for Belgium and show that the innovation effect of age diversity is positive where firms have heterogeneity of ages in the workforce but can be negative where the age distribution is dominated by a specific age group. Where age-related effects are negative Mothe and Nguyen-Thi (2021) show that these can be mitigated by effective HR practices (e.g. information sharing, training).

Few studies have considered the empirical relationship between disability in a workforce and innovation, with Lawton Smith *et al.* (2023) providing a recent review. The presence of disabled employees within a firm may, however, influence the nature of firms' innovation activity, encouraging responsible or inclusive innovation (Monteleone, 2020; Kasperová and Genus, 2023).

2.3 Work organization and innovation¹

The impact of work organisation on innovation is one of the most widely researched areas linking job quality and innovation (Erickson *et al.*, 2023). There are two main strands of this research: one that explicitly focuses on job structuring and control including high performance work practices, and the other that focuses on organisational culture and employer practices which support employee well-being (see Section 2.4).

Prior research suggests four aspects of job structuring which may influence innovation: job autonomy or control, variety, flexible working and employee consultation. In terms of autonomy or control, research consistently shows a positive relationship between work autonomy and innovation. For example, Tsang (2017) found that autonomy contributed to product development capability among R&D employees in Chinese aerospace companies, while (Takaishi *et al.*, 2019) suggest that, among Japanese employees and supervisors, individuals' innovative behaviour is supported by work autonomy, as it is among the leaders of Indonesian banking organisations (Suhandiah *et al.*, 2023). In both Takaishi *et al.*, (2019) and Suhandiah *et al.*, (2023) individual innovation behaviour was measured using multi-item scales. The mechanisms linking autonomy and control to innovative behaviours remain an area of active consideration reflecting aspects of motivation (Gambardella, Khashabi and Panico, 2013), empowerment and responsibility (Georgsdottir and Getz, 2004).

Task diversity or variety has also been considered as an element of high-performance work practices, and has been shown to be linked to long-term productivity gains due to increased efficiency when change-overs are required (Staats and Gino, 2012). In professional services concurrent task variety (undertaking tasks at the same time) has also been linked to increased productivity (Avgerinos and Gokpinar, 2018). Links to innovative behaviour are perhaps less clear, however, with Derfler-Rozin, Moore and Staats (2016) suggesting that task variety can support deliberative or reflective thinking, which may be positively related to innovation, while discouraging rule-breaking, which may reduce innovation.

Flexible working can provide advantages for both employers and employees: cost savings for employers when demand is variable, and adjustable hours for employees to match with other commitments. These employee advantages may generate greater job commitment and motivations for innovation. Based on a large sample of UK employers (Storey *et al.*, 2002) found that overall (when applied to all employees) flexible contracts were positively associated with innovative behaviour. However, the use of flexible contracts was generally 'de-coupled' from innovation, being related more strongly to issues around workflow, costs and productivity. Other studies have also suggested that the innovation effects of flexible contracts may depend on the nature of the sector itself (Kleinknecht, van Schaik and Zhou, 2014).

Finally, employee consultation as part of high-performance work practices may have both direct and indirect benefits for innovation. Directly consulting employees as part of an innovation process may help to source ideas and boost creativity (Tros 2022). Indirect advantages from consultation may also arise due to positive impacts on employee commitment and job satisfaction (Hall, 2010).

¹ This section draws on Erickson *et al.* (2023).

2.4 Workplace well-being, practices and innovation

Kesselring et al., (2014) describe health as a basic enabler of workplace innovation and supporting physical and mental health as necessary for workplace innovation. The evidence suggests that workplaces that are conducive to good health and/or can positively channel stressors make for a more innovation friendly environment. The most common focus is mental health and the ways in which workplace stress inhibits innovation. A positive emotional atmosphere can promote innovation, while a negative emotional atmosphere hinders it (Dou et al., 2022; Gasper, 2003; Isgett and Fredrickson, 2004; Mazzola and Disselhorst, 2019). Dou et al. also find that organisational climate, in the form of shared views, policies, practices and procedures and overall atmosphere as perceived by employees, including rewards and support, can impact on innovation. Klajkó and Czibor (2020) also show that psychological safety, in which employees feel able to share ideas and opinions with team members and others in the workplace, was positively associated with innovation.

In a comprehensive review of the literature, Elsamani, Mejia and Kajikawa (2023) report that organisational practices which support employees' well-being, for example increasing job resources, creating a high-quality working environment, and improving leadership competencies, also enhance individuals' innovativeness. Dolan and Metcalfe (2012) explain that from their study a 33% increase in life satisfaction is associated with 8% higher imagination; and if this relationship is causal, then improving individuals' wellbeing may be an effective way of increasing productivity and economic growth.

Workplace health practices can be defined as 'planned, behavioural, theory-based actions that aim to improve employee health and well-being through changing the way work is designed, organised, and managed' (Nielsen & Abildgaard, 2013; p. 278). Workplace practices vary widely (Graveling et al 2008), and many authors have attempted to establish a typology of workplace mental health practices. Drawing on this prior work (LaMontagne et al., 2014; Czabała et al., 2011; Fox et al., 2022), here we adopt the following categorisation for workplace mental health practices (WMHP) (Annex 1):

- Strategic and policy practices are formal initiatives and policies adopted at board level with the aim of planning, delivering, and tracking mental health and well-being interventions.
- Training and monitoring practices are embedded activities designed to develop mental health management skills in line managers, and to keep track of staff workload which may impact upon workplace mental health and well-being.
- Employee Well-being practices relate to funded initiatives aimed at promoting good physical and mental health, designed to support employee well-being.
- Risk reduction practices are designed to protect mental health, by encouraging a psychological safe workplace climate, reducing work-related risk factors, and ensuring workplace adjustments.

SECTION 3: DATA AND METHODS

3.1 Data

The data source for this project is the 2023 Workplace Mental Health & Wellbeing Employer questionnaire (ERC, 2023), which includes questions on innovation, workplace mental health issues, workplace mental health promotion practices (WMHP), workforce characteristics and firm factors. Surveys were conducted using Computer Assisted Telephone Interviewing (CATI). This is proven to be the best means of reaching the appropriate personnel within a business, typically with much better response rates than administering an online survey. Within each organisation, the most senior person with responsibility for the health and well-being of workers was sought for interview.

The target population of firms were private sector employers with 10 or more employees across the East and West Midlands of England. Both single-site and branches of multi-site organisations were included. The survey was conducted between 16th January 2023 and 5th May 2023. In total, 1,902 CATI interviews were completed, 906 in the East Midlands and 996 in the West Midlands. Quotas were applied by sector and employee size band to ensure sufficient representation for larger companies and smaller sectors. In the analysis, responses are therefore weighted to give representative results. For further details on the profiles of respondents see ERC (2023).

This survey forms part of a longitudinal data collection exercise, which has surveyed employers annually since 2020 (ERC, 2020; 2021; 2023). However, the three previous waves did not include questions on firms' innovation activities, and therefore only the 2023 survey data is employed for this analysis.

3.2 Variable definitions

Innovation Activities

We use two measures of innovation activity relating to product/service innovation and process innovation. In our sample, 40 per cent of firms have engaged in product/service innovation, i.e., they have introduced new or significantly improved products or services in the last three years (Table 3.1). 44 per cent of firms report process innovation, i.e., the introduction of new or significantly improved forms of organisation, business structures or processes over the last three years.

Diversity

Our survey data provides detailed information on the nature of firms' workforce. We follow other studies (Díaz-García *et al.*, 2013; Teruel *et al.*, 2015; Wikhamn and Wikhamn, 2020), in using Blau indices to provide a measure of workforce diversity with respect to gender, ethnicity and disability. Respondents to the survey provided information on the proportion of their workforce which is female. From this data, we calculated a Blau index of gender diversity, where zero reflects no gender variation (i.e. workers are either all male or all female), and 0.5 reflects gender equality (50% of workers are male and 50% are female). A Blau index of 0.32

reflects some gender diversity albeit with one gender generally forming a greater proportion of the workforce (Table 3.1).

Table 3.1: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
Innovation variables					
Product Innovation	1599	0.395	0.489	0	1
Process Innovation	1582	0.437	0.496	0	1
Inclusive work practices:					
Gender diversity	1599	0.321	0.154	0	0.5
Ethnic diversity	1599	0.136	0.152	0	0.5
Disability diversity	1599	0.041	0.083	0	0.5
High Performance Work Practices					
Control	1599	0.750	0.433	0	1
Variety	1599	0.854	0.353	0	1
Flexible working	1599	0.729	0.445	0	1
Consultation	1599	0.917	0.276	0	1
Firm characteristics					
Sales growth	1599	0.493	0.500	0	1
New technology	1599	0.511	0.500	0	1
Firm age	1599	19.697	6.785	4	25
Regional Market	1599	0.403	0.491	0	1
Graduate workforce	1599	26.131	27.186	0	100
Older workforce	1599	29.360	22.057	0	100
Firm Size					
10-19 employees	1599	0.525	0.500	0	1
20-49 employees	1599	0.333	0.471	0	1
50-249 employees	1599	0.131	0.338	0	1
250+ employees	1599	0.011	0.103	0	1
Sector					
Production	1599	0.231	0.422	0	1
Construction	1599	0.074	0.262	0	1
Wholesale/Retail	1599	0.194	0.396	0	1
Hospitality	1599	0.110	0.313	0	1
Business Services	1599	0.219	0.414	0	1
Other Services	1599	0.171	0.377	0	1

In relation to ethnicity, the survey data provides us with the proportion of the workforce that are categorised as from a 'non-white ethnic minority group'. Therefore, the Blau index of ethnic diversity in the workforce again ranges from zero to 0.5, where zero reflects no ethnic variation (all workers are either from the white majority ethnicity or a non-white minority ethnicity), and 0.5 reflects ethnic diversity (50% of workers are from each group). The Blau index for ethnicity is 0.136 which reveals less diversity in these firms with respect to ethnicity relative to gender (Table 3.1). The Blau index for disability is also calculated using the share of the workforce reporting a disability. Here a score of zero reflects no variation (i.e. all workers either report no disability or all workers report a disability) while 0.5 reflects 50% of workers do not report a disability and 50% report having a disability. There is little diversity with respect to disability as the Blau index of 0.04 is close to zero (Table 3.1).

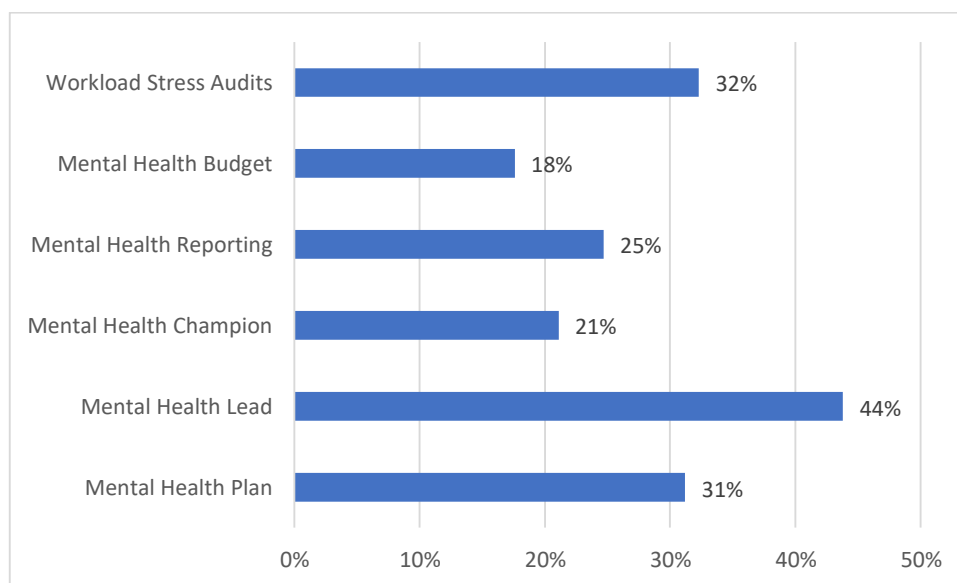
High Performance Work Practices

The survey also includes questions related to high performance work practices. Respondents are asked to think about the systems and processes they have in place for staff, and to what extent they agree with the following: ‘employees have control over how they work, employees have variety in their work; employees have access to flexible working, employees are consulted if any changes are proposed’. We convert the original Likert indices into binary variables with a value of 1 if respondents ‘strongly agreed’ or ‘agreed’ with these statements, and zero otherwise. Large proportions of firms agree that employees have control over how they work (75 per cent), have variety in their work (85 per cent); have access to flexible working (73 per cent), and are consulted if changes are proposed (92 per cent) (Table 3.1).

Workplace health practices

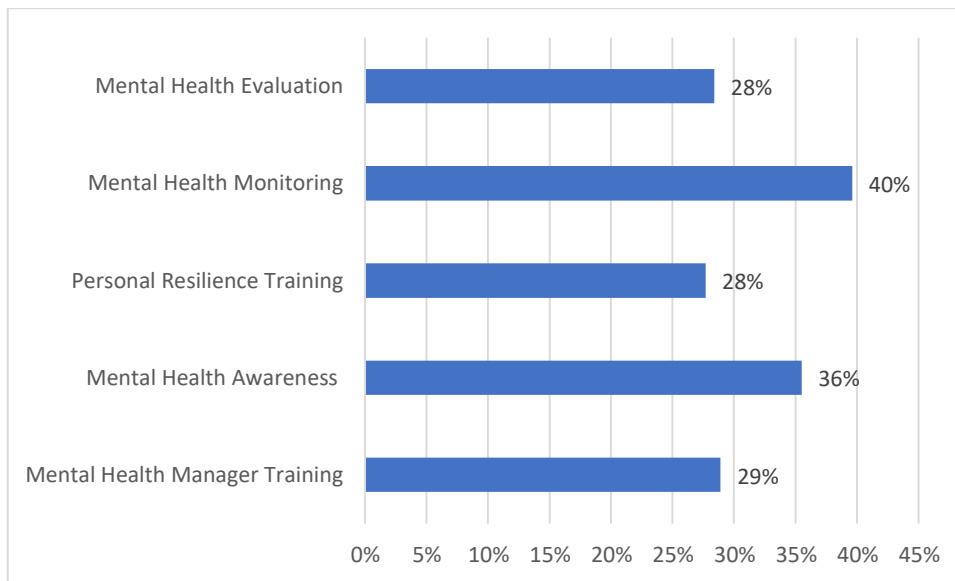
The survey includes a large number of questions relating to WMHP. As outlined in Section 2.4, we categorise these practices as (i) strategic and policy practices; (ii) training and monitoring practices, (iii) employee well-being practices, and (iv) risk reduction practices. Next, we describe the practices firms have adopted to support and promote employee mental health and well-being. A description of each individual WMHP is available in Appendix A1.

Figure 1: Strategic and Policy Practices



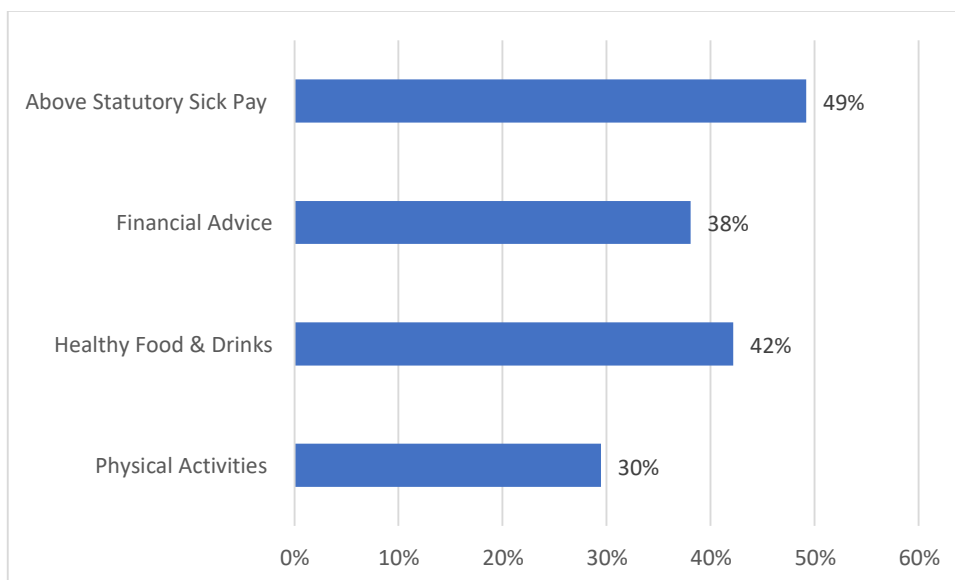
In relation to strategic and policy practices (see Figure 1), 44 per cent of firms have mental health lead at board/ senior level; 32 per cent of firms conduct workload stress audits and 31 per cent have a formal mental health plan. One in four firms report on their mental health approach internally and externally. Approximately one in five firms report having employee mental health champion, while 18 per cent have a dedicated budget for mental health and well-being promotion.

Figure 2: Training & Monitoring Practices



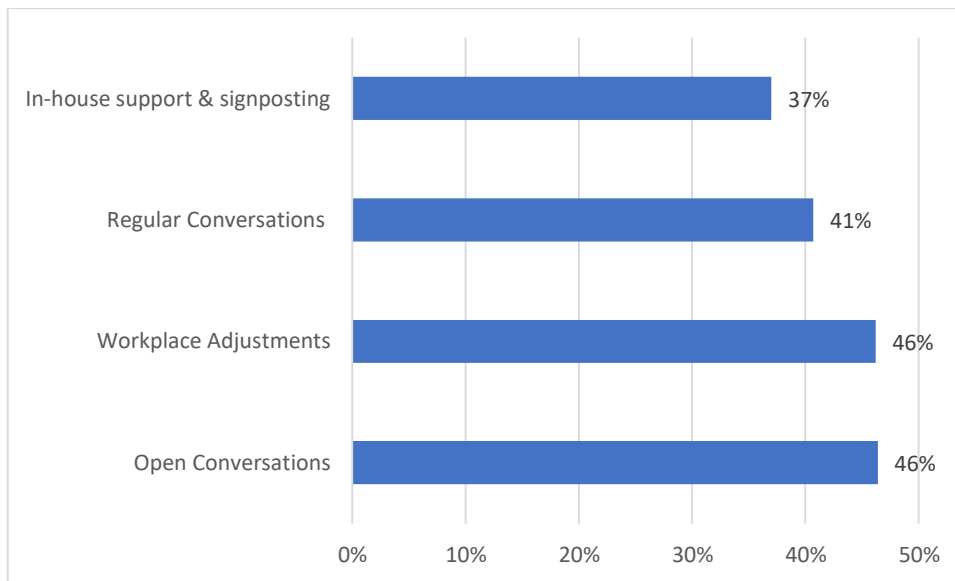
29 per cent of firms provide training for line managers in managing mental health, while 40 per cent of firms use data to monitor employee mental health and wellbeing (see Figure 2). 36 per cent of firms have provided awareness raising for staff on mental health issues, and 28 per cent have provided training aimed at building personal resilience. 28 per cent of firms takes steps to evaluate the impact of mental health and wellbeing activities.

Figure 3: Employee Well-being Practices



30 per cent of firms provide support for physical activity such as gym memberships and cycle to work schemes (see Figure 3). 42 per cent of firms provide healthy food and drinks. 38 per cent of firms provide financial advice for employees and almost half of firms provide sick pay above the statutory sick pay requirements.

Figure 4: Risk-reduction practices



46 per cent of firms encourage open conversations about mental health in the workplace and make appropriate workplace adjustments to those who need them to support their mental health (see Figure 4). 41 per cent of firms ensure that all staff have a regular conversation about their health and wellbeing with their manager. 37 per cent of staff provide in-house mental health support and signposting to other services.

Firm characteristics

We include a number of other variables in the modelling to control for firm characteristics which may also influence levels of innovative activity. In terms of the proportion of graduates, firms report that, on average, 26 per cent of workers have a degree or higher-level qualification (Table 3.1). The age profile of workers is measured with the older workforce variable, i.e. the proportion of the workforce that are over 50 years of age. In this sample, on average 29 per cent of workers are over 50 years of age.

49 per cent of firms have experienced growth in sales in the previous 12 months. Firm age ranges from 4 to 25 years, and on average firms are 20 years old. 40 per cent of firms serve a regional market and 51 per cent have introduced digital technologies in the previous 12 months (Table. 3.1). With respect to firm size, 53 per cent of firms employ 10-19 workers, 33 per cent 20-49 workers, 13 per cent 50-249 workers, and 1 per cent employ 250+ workers. We categorise firms across six main sectors: production (23 per cent); construction (7 per cent); wholesale/retail (19 per cent); hospitality (11 per cent); business services (22 per cent) and other services (17 per cent).

3.3 Methodological approach

We adopt a two-stage methodology to address the research questions outlined in Section 1. First, we use probit models to investigate the impact of workforce diversity and high-performance work practices on the propensity to innovate. Second, and controlling for the impact of diversity and HPWPs on innovation, we use a potential outcomes treatment model to estimate the innovation effects of workplace mental health and well-being practices. We describe each element of the analysis in turn.

Understanding the innovation effects of workforce diversity and HPWPs

Here we address the first two research questions: Is workforce diversity positively related to innovation outcomes? And, how do high performance work practices contribute to innovation outcomes? To investigate this potential relationship further, we take a simple innovation production function approach. The relationship between innovation output and innovation inputs has been used extensively in the literature (Crepon et al., 1998; McCann and Simonen, 2005; Griffith et al., 2008; Roper et al., 2008). Our innovation production function can be depicted as follows:

$$Y_i = \beta_0 FC_i + \beta_1 WD_i + \beta_2 HPWP_i + e_i$$

where Y_i is innovation output; the vector FC_i represents firm characteristics; the vector WD_i represents workforce diversity measures; the vector $HPWP_i$ represents high-performance work practices; and e_i is a random disturbance term. It is important to acknowledge that much of the innovation literature would also include research and development (R&D) activities as a key innovation input, however due to data constraints we are unable to include any R&D indicators (Jaffe, 1986; Crepon et al., 1998; Freel, 2003; Roper et al., 2008).

Given the binary nature of the dependent variables, i.e. product innovation or process innovation, we employ Probit regression analysis to determine the relationship between workforce diversity measures and innovation, as well as the influence of high-performance work practices and firm characteristics.

Understanding the effects of mental health and well-being practices

To address the third research question - How do workplace practices to support good mental health and well-being among employees contribute to innovation? – we adopt a potential outcomes treatment approach controlling for the impacts of workforce diversity and firms' adoption of MHWP. In this analysis each individual MHWP is implemented as a separate 'treatment' with individual firms observed either implementing or not implementing the MHWP. We do not observe what would have happened if firms which actually implemented a MHWP did not. Potential-outcome models provide a solution to this missing-data problem and allow us to estimate firm-level treatments.

In intuitive terms we use the probit models discussed earlier to predict the probability that a firm will be innovating (known as the potential-outcome means or POMs). Differences in the means of these regression adjusted POMs between treated and untreated firms across the whole sample then provide an estimate of the average treatment effect (ATE) of the MHWP.

SECTION 4: EMPIRICAL RESULTS

4.1 Workforce diversity, high performance work practices and innovation

We focus initially on the impacts of workforce diversity and high-performance work practices on innovation. Based on earlier studies (see Section 2) we anticipate that high performance work practices should be positively linked to innovation. For workforce diversity, while conceptual frameworks are ambiguous, empirical studies also suggest we should expect to see a positive innovation effect. Table 2 reports probit models for product and process innovation including both the Blau indices measuring workforce diversity and the four HPWP measures. The table suggests three key results in terms of workforce diversity:

- First, while gender diversity is not statistically significant with respect to product innovation, there is a strong, positive and significant association between gender diversity and process innovation. This indicates that firms with greater gender diversity have a greater probability of introducing new or significantly improved forms of organisation, business structures or processes.
- Second, our results reveal a different pattern with respect to ethnic diversity. Here we see a positive and statistically significant relationship with product innovation, although this relationship is not evident for process innovation. In other words, firms with a more ethnically diverse workforce have a greater probability of introducing new products or services.
- Third, a positive association exists between firms that have greater diversity with respect to workers with a disability and process innovation, although not product innovation. This finding is perhaps not surprising as firms with more disabled workers may find it necessary to change or improve forms of organisation, business structures or processes to remove accessibility barriers (Needels and Schmitz, 2006).

Overall, therefore we find a positive relationship between each aspect of gender, ethnic and disability diversity and firms' innovation outcomes.

Interestingly, there is little evidence of any significant relationship between innovation and high-performance work practices relating to control or autonomy over work and variety in your work. We do, however, see a statistically significant positive relationship between access to flexible working and product innovation. Firms that provide access to flexible working to their employees are 19 per cent more likely to introduce new products or services. There is also evidence of a positive relationship between firms that consult with employees and process innovation, albeit only at the 10 per cent level of significance. **Our results suggest that offering flexible working may be an important element of building a workplace culture which best supports innovation.**

We also include several firm characteristics in the Probit models. Our results show no relationship between innovation and firms who primarily serve a regional market. However positive sales growth is positively associated with both product and process innovation, as is the introduction of new digital technology. We find no relationship between a higher proportion of graduates and product or process innovation. In relation to firms with an older workforce (i.e. workers over 50 years of age) we see a negative relationship with process innovation. However, the size of the coefficient is very small (-0.004) revealing for each 1 per cent increase in workers over 50 years of age in a firm, the probability of engaging in process innovation decreases by 0.4 per cent.

Table 4.1: Probit estimations for product and process innovation

	Product Innovation	Process Innovation
Gender diversity	0.227 (0.261)	0.622** (0.252)
Ethnic diversity	0.791*** (0.255)	0.258 (0.250)
Disability diversity	0.128 (0.426)	0.988** (0.430)
HPWP: Control	0.036 (0.089)	0.043 (0.089)
HPWP: Variety	0.172 (0.108)	0.065 (0.107)
HPWP: Flexible working	0.189** (0.088)	0.125 (0.085)
HPWP: Consultation	0.099 (0.132)	0.236* (0.129)
Sales growth	0.219*** (0.073)	0.198*** (0.073)
New technology	0.689*** (0.075)	0.490*** (0.073)
Firm age	-0.005 (0.006)	-0.009 (0.005)
Regional market	-0.007 (0.083)	-0.106 (0.083)
Graduate workforce	0.000 (0.001)	-0.002 (0.001)
Older workforce	-0.000 (0.002)	-0.004** (0.002)
Observations	1599	1595
Pseudo R ²	0.085	0.070

Notes: Standard errors are in parentheses. *** $p < .01$, ** $p < .05$, * $p < .1$. All models include sector and size controls.

4.2 Do WMHP influence firm level innovation?

To investigate the potential for WMHP to influence innovation activities within firms, we undertake a ‘treatments effect’ analysis. Treatment effects refers to the causal effect of a binary variable on an outcome variable of interest. Here, the outcome variable of interest is innovation (as measured by product and process innovation) and the ‘treatment’ are individual WMHPs. Specifically, we use regression adjustment estimators which use the contrasts of the averages of treatment-specific predicted outcomes to estimate the treatment effects adjusted for covariates. Conditioning on enough covariates will ensure that any remaining influences on the treatment are not related to the potential outcomes. In our estimations, we include the independent variables and controls used in the previous probit estimations of product and process innovation (i.e., Table 4.1).

Our results are presented as percentages to alleviate scaling issues and aid interpretation. Therefore, we express the Average Treatment Effect (ATE) of an individual WMHP as a percentage of the untreated (i.e. absence of individual WMHP) potential outcome means (Pompili *et al.*) to gain a more intuitive measure of efficacy.

4.2.1 Product innovation

Our results, presented in Table 4.2, highlight the positive relationship between eleven (of the nineteen) WMHPs and product innovation. Focusing first on the strategic and policy practices, there is a positive and statistically significant relationship between having a mental health budget and product innovation. Our findings reveal that firms with a dedicated mental health budget are 9 per cent more likely to engage in product innovation than firms that do not. Also, firms that undertake risk assessments, stress audits and/or reviews of staff workloads are 6 per cent more likely to engage in product innovation than firms that do not. There is also evidence of a positive relationship between having a mental health lead at board/senior level and product innovation, albeit only at the 10 per cent level of significance. There is no evidence of mental health plan, mental health champion and internal and external reporting of the organisation's mental health approach being associated with product innovation.

In terms of training and monitoring practices, our results reveal a positive relationship between mental health awareness raising for employees and product innovation. Firms that provide this WMHP are 6 per cent more likely to introduce a new product or service than firms that do not. This relationship is statistically significant at the 10 per cent level. Likewise, evaluating the impact of mental health and well-being activities and using data to monitor employee health and well-being is positively associated with product innovation. Firms that provide these WMHP are 8 per cent more likely to introduce new products and services. These relationships are statistically significant at the 10 per cent level. Interestingly, there is no evidence of a relationship between the training variables, i.e. mental health training for managers and personal resilience training, and product innovation.

We include four employee wellbeing practices in our analysis – supports for physical activity (e.g. gym membership), supplying healthy food and drinks, financial well advice and offering sick pay above statutory levels. Two of these practices are associated with product innovation. Firms that provide healthy food and drinks and financial wellbeing advice for their employees are 7 and 5 per cent more likely to report product innovation than firms that do not. These results are statistically significant at the 5 per cent level.

Finally, we consider the relationship between risk reduction practices and product innovation. Three of these practices are positively associated with product innovation: encouraging open conversations about mental health in the workplace, making appropriate workplace adjustments to those who need them to support their mental health and ensuring all staff have a regular conversation about their health and well-being with their manager. Individually these practices are associated with a 6-7 per cent increase in the likelihood of firms introducing a new product or service. However, in-house mental health support and signposting of services are not associated with product innovation.

4.2.2 Process innovation

We find a consistently positive relationship between individual WMHP and the introduction of new or significantly improved forms of organisation, business structures or processes. In fact, this positive relationship is statistically significant for 17 of the 19 WMHP included in our analysis.

Firms that introduce strategic and policy practices (mental health plan, mental health champion, mental health reporting, mental health budget and workload stress audits) are 10-14 per cent more likely to introduce new or significantly improved forms of organisation, business structures or processes. However, having a mental health lead is associated with a 40 per cent increase in process innovation. All these results are statistically significant at the 1 per cent level. Likewise, all the training and monitoring practices are positively associated with process innovation. The increased likelihood of process innovation is 9 per cent for firms that use data to monitor employee health and well-being and 11 per cent for firms evaluating the impact of mental health and well-being activities. Mental health training for managers, raising mental health awareness and personal resilience training is associated with an increased probability of 18, 15 and 12 per cent in process innovation respectively. All these results are statistically significant at the 1 per cent level.

In terms of the employee wellbeing practices, supplying healthy food and drinks and paying sick pay above statutory levels is not associated with process innovation. However, support for physical activities and financial well-being advice is positively associated with process innovation. These practices are associated with an increase of 6-7 per cent in the probability of process innovation.

All the risk reduction practices included in the analysis are positively associated with an increase in the probability of process innovation at the 1 per cent level of significance. Specifically, encouraging open conversations about mental health in the workplace is associated with a 14 per cent increase in the probability of process innovation, as is providing in-house support and signposting of services. Making appropriate workplace adjustments to those who need them to support their mental health and ensuring all staff have a regular conversation about their health and well-being with their manager are associated with a 13 and 12 per cent increase in the probability of process innovation.

Table 4.2: Treatment effects of WMHP on product and process innovation

	Product Innovation		Process Innovation	
	β	Std. Err.	β	Std. Err.
<i>Strategic & Policy practices</i>				
Mental Health Plan	0.027	(0.024)	0.101***	(0.025)
Mental Health Lead	0.049*	(0.025)	0.412***	(0.015)
Mental Health Champion	0.037	(0.030)	0.134***	(0.035)
Mental Health Reporting	0.023	(0.028)	0.131***	(0.031)
Mental Health Budget	0.088**	(0.034)	0.138***	(0.039)
Workload Stress Audits	0.060**	(0.027)	0.128***	(0.028)
<i>Training & Monitoring practices</i>				
Mental Health Manager Training	0.032	(0.028)	0.177***	(0.031)
Mental Health Awareness	0.060**	(0.026)	0.148***	(0.028)
Personal Resilience Training	0.028	(0.028)	0.116***	(0.030)
Mental Health Monitoring	0.078***	(0.025)	0.090***	(0.026)
Mental Health Evaluation	0.076***	(0.028)	0.113***	(0.029)
<i>Employee Wellbeing practices</i>				
Physical Activities	-0.033	(0.027)	0.074***	(0.028)
Healthy Food & Drinks	0.065**	(0.025)	0.014	(0.026)
Financial Advice	0.053**	(0.025)	0.061**	(0.025)
Above Statutory Sick Pay	-0.017	(0.025)	0.011	(0.025)
<i>Risk reduction practices</i>				
Open Conversations	0.065**	(0.025)	0.136***	(0.026)
Workplace Adjustments	0.071***	(0.025)	0.132***	(0.027)
Regular Conversations	0.055**	(0.026)	0.124***	(0.027)
In-house support & signposting	0.026	(0.026)	0.136***	(0.028)

Notes: Standard errors are in parentheses. *** $p < .01$, ** $p < .05$, * $p < .1$. As the outcome is binary, probit estimations are used. All models include all explanatory variables and sector and size controls in probit estimations in Table 2.

SECTION 5. SUMMARY AND IMPLICATIONS

5.1 Summary of key results

Previous research has considered the effects on business growth and productivity of workforce diversity, high performance work practices and measures to support good employee mental health and well-being. There is considerably less evidence on their links to innovation, although we anticipate positive relationships in each case. Here, using survey data from a large sample (c. 1900) of firms from the East and West Midlands of England we contribute to this evidence base. Focusing on firms' ability to introduce new product or process innovations, our analysis suggests three key results:

- Greater workforce diversity in terms of gender, ethnicity and disability is positively associated with an increase in the propensity to undertake product and process innovation;
- Providing flexible working is positively associated an increase in the propensity to undertake product innovation;
- Taking measures to support employee mental health and well-being are strongly associated with both product and process innovation.

In considering these results it is worth noting that these results are correlations rather than causal linkages. In each case, however, we condition for a range of other firm level characteristics.

5.2 Implications

Our results suggest that building a more inclusive workplace is strongly associated with higher levels of innovation activity. This enriches the business case for building more inclusive workplaces which typically focus on the better-established productivity benefits.

Existing adoption of measures to promote an inclusive workplace by firm sizeband is profiled in Table 5.1. This suggests a number of differences between smaller and larger firms which inform the development of policy support or intervention:

- Gender and disabled diversity are similar across firm sizebands. Ethnic diversity is more limited in smaller firms suggesting that these companies might be missing out on some of the innovation advantages of diversity;
- Flexible working is almost equally common across all firm sizebands;
- Implementation of practices to support employee mental health and well-being is notably less common in smaller firms suggesting again that these firms may be missing out on the potential innovation advantages of such measures.

In policy terms our results on the innovation benefits of building an inclusive workplace provide strong support for measures designed to promote employment diversity (by gender, ethnicity

and disability), flexible working, and the implementation of practices to support employee mental health and well-being. In a number of cases – ethnic diversity, mental health and well-being practices – aspects of more inclusive workplaces are, however, less well represented in smaller firms. This may to some extent reflect the more informal nature of smaller companies but under-representation of mental health and well-being practices in smaller firms has also previously been linked to a lack of resources and knowledge (Hente and Schlesinger, 2021; Wierenga *et al.*, 2013). Smaller firms may therefore provide a focus for targeted measures designed to promote the benefits of workforce diversity and supporting good mental health and well-being.

Table 5.1: Measures to support inclusive workplaces by firm sizeband

	Employee sizeband		
	10-19	20-49	50 plus
Workforce Diversity			
Gender – Blau index	0.32	0.31	0.36
Ethnicity – Blau index	0.11	0.15	0.21
Disabled – Blau index	0.04	0.04	0.05
Flexible working (% firms)	72.0	74.2	73.6
Strategic & Policy practices (% firms)			
Mental Health Plan	25.2	34.2	43.2
Mental Health Lead	36.0	49.1	57.3
Mental Health Champion	13.9	24.4	39.2
Mental Health Reporting	17.9	29.8	38.3
Mental Health Budget	12.3	21.1	28.6
Workload Stress Audits	25.1	37.0	47.1
Training & Monitoring practices (% firms)			
Mental Health Manager Training	20.0	34.7	45.4
Mental Health Awareness	27.0	40.6	55.1
Personal Resilience Training	21.6	32.1	38.3
Mental Health Monitoring	31.3	44.3	59.9
Mental Health Evaluation	21.8	33.6	37.9
Employee Wellbeing practices (% firms)			
Physical Activities	23.6	32.1	44.5
Healthy Food & Drinks	40.2	44.0	43.6
Financial Advice	32.0	41.5	53.3
Above Statutory Sick Pay	45.3	50.6	59.9
Risk reduction practices (% firms)			
Open Conversations	37.5	53.9	60.8
Workplace Adjustments	36.0	54.9	62.6
Regular Conversations	33.2	47.0	53.3
In-house support & signposting	28.0	42.5	57.3

Table A1: Variable definitions

Innovation variables

Product innovation	Introduced new or significantly improved products or services in the last three years
Process innovation	Introduced new or significantly improved forms of organisation, business structures or processes over the last three years

Workforce characteristics

Graduate workforce	% of workforce with a degree or higher-level qualification
Older workforce	% of workforce aged 50 or over
Gender diversity	Blau index of gender diversity in workforce: 0 reflects no gender variation (all workers are either male or female); 0.5 reflects gender equality (50% of workers are male and 50% are female)
Ethnic diversity	Blau index of ethnic diversity in workforce: 0 reflects no ethnic variation (all workers are either from the majority ethnicity or a minority ethnicity); 0.5 reflects ethnic diversity (50% of workers are from the majority ethnicity and 50% are from ethnic minorities)
Disability diversity	Blau index of disability diversity in workforce: 0 reflects no variation (all workers either report no disability or all workers report a disability); 0.5 reflects diversity in disabled workers (50% of workers do not report a disability and 50% report having a disability)

Firm characteristics

Sales growth	Growth in sales over the previous 12 months
Firm age	Age of the firm (years)
Regional market	Products or services sold primarily in the regional market (within the East or West Midlands) (0/1)
New technology	Introduced changes in digital technologies over the previous 12 months (0/1)
Firm Size	10-19; 20-49; 50-249; 250+ employees
Sector	Production, Construction, Wholesale/Retail, Hospitality, Business Services and Other Services

High Performance Work Practices

Control	Employees have control over how they do their work (0/1)
Variety	Employees have variety in their work (0/1)
Flexible working	Employees have access to flexible working (0/1)
Consultation	Employees are consulted if any changes are proposed (0/1)

Workplace Health Promotion Practices

Strategy and policy practices

Mental Health Plan	The presence of a mental health plan (0/1)
Mental Health Lead	Having a mental health and well-being lead at board level (0/1)
Mental Health Champion	Having employee mental health champions (0/1)
Mental Health Reporting	Undertaking internal and external reporting of the organisation's mental health approach (0/1)

Mental Health Budget	Having a budget for mental health and well-being activities (0/1)
Workload Stress Audits	Having carried out risk assessments stress audits and/or reviews of staff workloads in the past 12 months. (0/1)
Training and monitoring	
Mental Health Manager Training	Training for line managers in managing mental health (0/1)
Mental Health Awareness Personal Resilience Training	Awareness raising for staff on mental health issues (0/1) Training aimed at building personal resilience (0/1)
Mental Health Monitoring	Evaluating the impact of mental health and well-being activities (0/1)
Mental Health Evaluation	Using data to monitor employee health and well-being (0/1)
Employee Wellbeing practices	
Physical Activities	Support with physical activity such as gym memberships (0/1)
Health Food & Drinks	Supplying healthy food and drinks (0/1)
Financial Advice	Financial well-being advice (0/1)
Above Statutory Sick Pay	Offering sick pay above statutory Level. (0/1)
Risk reduction practices	
Open Conversations	Encouraging open conversations about mental health in the workplace (0/1)
Workplace Adjustments	Making appropriate workplace adjustments to those who need them to support their mental health (0/1)
Regular Conversations	Ensuring that all staff have a regular conversation about their health and well-being with their manager (0/1)
In-house support & signposting	In-house mental health support and signposting to other services (0/1)

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