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Title: The experience of ancillary hospital workers during COVID: a systematic review and narrative synthesis

Author's names:

Kearsley S. Doctoral student, Faculty of Health Sciences, University of Hull, Hull, UK

Walker L. Professor of Health and Social Work Research, School of Psychology and Social Work, Faculty of Health Sciences, University of Hull, Hull, UK

Bravington, A. Research Fellow, Wolfson Palliative Care Research Centre, Hull York Medical School, University of Hull, Hull, UK

Johnson MJ. Professor of Palliative Medicine, Wolfson Palliative Care Research Centre, Hull York Medical School, University of Hull, Hull, UK

Corresponding author:

Correspondence to: Sarah Kearsley, Faculty of Health Studies, University of Hull, HU6 7RX, S.Kearsley-2019@hull.ac.uk

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ABSTRACT

Background: COVID-19 overwhelmed healthcare systems worldwide. Its impact on clinical staff is well-documented, but little is known about the effects on ancillary staff (cleaners, porters, and caterers).

Aim: To identify evidence of the impact of COVID-19 on ancillary staff at NHS hospitals in England.

Design: Systematic review and narrative synthesis.

Data sources: Databases (MEDLINE, CINAHL Ultimate, APA PsycINFO, APA PsycArticles, and Academic Search Ultimate). Reference lists were searched. Four independent reviewers screened titles and abstracts against inclusion criteria. Data were extracted from included papers and studies were critically assessed using relevant critical appraisal tools.

Results: 8/178 studies were included: five quantitative, two qualitative, one mixed-methods. Ancillary staff had higher rates of past and present COVID-19 infection. Participants felt that the work of ancillary staff had been insufficiently recognised by managers and that they had little voice within the NHS. They also experienced inequity regarding available support and safe working practices due to largely digital modes of communication which they rarely, if ever, used. In an evaluation of a personal protective equipment support 'helper' programme, ancillary workers were more positive about it than nurses, allied health practitioners, and doctors.

Conclusion: Few studies included ancillary staff. Where reported, ancillary staff at NHS hospitals had a higher prevalence of COVID-19 infection but felt marginalised and poorly supported. They valued training when offered. Additional research is needed to understand better the impact of COVID-19 on ancillary key workers, and how best to support them in future similar circumstances.

Keywords: COVID-19; Ancillary staff; Systematic review.

KEY STATEMENTS

What is already known on this topic

- COVID-19 has had a detrimental impact on clinical hospital staff
- Little is known about the effects of COVID-19 on essential non-clinical hospital ancillary staff (cleaners, porters, caterers) yet they are key workers

What this study adds

- Ancillary staff at NHS hospitals had a higher risk of contracting COVID-19 infection, and this risk was poorly mitigated
- Hospital ancillary staff experienced marginalisation and inequities regarding support and training because of the reliance on digital communication methods in hospital, and access to personal protective equipment (PPE)

How this study might affect research, practice or policy

- Hospital ancillary staff must be included in training regarding infection control and use of PPE, and alternatives to digital training considered
- Hospital ancillary staff should have equal access to adequate PPE, and other Trust provided support
- There is a need to value the 'forgotten tribe' of crucial workers
- Fostering a culture of inclusion is crucial, through practices such as accessible team meetings and visible management
- There is a need for a holistic vision of health and social care in the UK, to reduce inequities between groups of workers
- For future research, their voice should be sought using inclusive engagement methods to ensure they are adequately represented in studies

INTRODUCTION

In December 2019, COVID-19 emerged in China [1], and acquired pandemic status on March 11, 2020 [2]. By April 2023, the cumulative global death toll was over 6.8 million [3]. The world is learning to live with the lasting effects across multiple facets of life, including the destruction of livelihoods and pressure on healthcare systems [4, 5].

Healthcare services have been at the forefront throughout the pandemic [6]. As people worldwide stayed home, healthcare workers put themselves at risk to care for others [7]. The impact of COVID-19, especially the high death rate, on clinical healthcare staff, including physical and mental exhaustion, sleep disorders, moral injury, and mental health issues, [8, 9, 10] is well described. Yet we know little of the impact on non-clinical ancillary hospital staff.

Ancillary staff are integral to the functioning of hospitals. Porters transported infectious COVID-19 patients across hospitals and deceased patients to mortuaries [11], cleaning staff cleaned areas where people with COVID-19 were treated [12], and catering staff provided sustenance for staff and COVID-19 patients [13]. Cleaning staff had a crucial role in infection control [12]. Ancillary staff were deemed 'key workers' during the pandemic. They faced risks of contracting COVID-19, as did their clinical colleagues, yet their experience has been overlooked [14, 15].

Ancillary staff may be particularly vulnerable to COVID-19. In the UK, many ancillary services are contracted to external companies by the NHS [16, 17]. Therefore, they may not share the same paid sick leave, access to adequate personal protective equipment (PPE), and role consistency as staff directly employed by the NHS [14, 17, 18]. In the context of COVID-19, the lack of certain employment benefits may undermine infection control measures, placing both patients and staff at risk [14, 18]. Without paid sick leave, staff may attend the workplace with COVID-19 symptoms, as self-isolating may be unaffordable [14, 18]. Hospitals with outsourced cleaning staff have higher rates of nosocomial infections [16].

There is a dearth of literature addressing the effects of COVID-19 on ancillary staff working at NHS hospitals in the UK. Their experiences and perceptions have not been sought or heard. This systematic review aims to explore what is known from the published literature about the impact of COVID-19 on ancillary staff working at NHS hospitals in the UK.

METHODS

We conducted a non-registered systematic literature review and narrative synthesis and reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [19].

Search strategy

An academic and library specialist assisted with the search strategy. Five databases were searched using EBSCO as a platform: MEDLINE, CINAHL Ultimate, APA PsycINFO, APA PsycArticles, and Academic Search Ultimate. The date range was set from January 2020, the start of rising COVID-19 cases in the UK, to January 2024, when the search was conducted. The search terms and strings were developed to identify the population (ancillary staff working at NHS hospitals) and exposure (COVID-19) (see Online Supplement Table 1). Outcome was omitted in the search to allow a wide range and unforeseen impacts of COVID-19 on staff to be captured. Reference lists and citations of included studies were searched. The search was limited to papers written in the English language.

Eligibility criteria

Types of participants: Eligible studies included ancillary staff (cleaning staff, porters, catering staff).

Study settings: Studies in UK NHS hospitals that treat acute COVID-19 patients (e.g., regional teaching hospitals, local general hospitals/district general hospitals). Studies in settings that do not (e.g., rehabilitation, community, or 'cottage' hospitals, private hospitals, residential care homes, primary care settings) were excluded.

Types of study design: All types of quantitative, qualitative, and mixed-methods studies. Protocols, opinion pieces, conference abstracts and editorials were excluded.

Study selection

SK screened all titles and abstracts against the eligibility criteria. All abstracts were independently screened by at least one other independent reviewer (LW, AB, MJ). Disagreements were resolved through discussion between the reviewing pairs, with access to a third opinion for continued discrepancies. Agreed papers for inclusion, or where a decision could not be made from the title and abstract, were retrieved in full for further review, where a similar process was followed.

Data extraction

Data were extracted into a table of included studies (author, year, aim, design, participant characteristics, study outcomes collected, and findings; see Table 1) by SK. Double-data extraction was carried out by one other reviewer (LW, MJ, or AB). Discrepancies were resolved by consensus between all four reviewers where necessary.

Quality assessment

The methodological quality of all studies was judged using a relevant/closely matched critical appraisal tool [20, 21, 22] (see Online Tables 2-4). One reviewer (SK) assessed all the studies. Studies were then independently assessed by one other reviewer (LW, MJ, or AB). Any discrepancies were resolved between the assessing pairs. This is not an effectiveness review, therefore the quality of studies was not used as an inclusion criterion.

Synthesis and analysis of results

Guided by principles of Popay and colleagues we conducted a narrative synthesis to 'tell the story of the included studies' [23]. The key findings of each study were coded and structured into meaningful categories [24] by observing for patterns across the data (SK). As there were limited literature, some themes emerged from a single paper. This is acceptable in the context of this review: a theme is not dependent upon quantifiable measures, but upon whether it captures something meaningful in relation to the question [25]. Relationships and patterns in the data were explored further to consider factors that may explain the findings. The quality of studies was considered in this process.

RESULTS

The search process for the included studies is summarised in a PRISMA flow chart ([Figure 1](#)). The original database search identified 178 records following de-duplication. Overall, eight studies met the inclusion criteria. A list of the excluded studies, with reasons, is given in Online Supplement Table 6.

Study characteristics.

Study design and setting: Of the quantitative papers, four cross-sectional studies [26, 27, 28, 29] and one cohort study [30] were included. One 'cohort' study design was poorly described, with some aspects appearing to be repeat cross-sectional analyses [28]. Four were conducted at large teaching hospitals [26, 27, 28, 30]. One [28] was based across multiple sites within one large teaching hospital Trust, including a tertiary referral centre, community sites, and an off-site non-clinical hub [29]. One qualitative paper involved a framework analysis of free-text comments from surveys. Data were collected at multiple sites within one NHS health board, including acute hospitals and mental health services [31].

The other qualitative study involved a framework analysis of semi structured interview transcripts, conducted with staff at one specialist NHS children's hospital [32]. The mixed-methods paper reported a survey collecting both free-text and quantitative responses [33]. This study was conducted at a group of hospitals within one large teaching hospital Trust [33]. The characteristics, results, and further details of included studies are summarised in Table 1.

Of the quantitative studies, sample sizes ranged from 545 [26] to 17,126 [29]. One qualitative paper involved 1,123 [31] participants, and the other 36 [32]. The mixed-methods study included 261 participants [33]. Only one study [32] included a sample size calculation.

Participants: Across the 8 studies, 39,633 participants were included. Participants were from a broad range of staff groups, shown in Table 1. It is not possible to ascertain the exact number of ancillary staff participants in some studies as they are not distinctly categorised: for example, included in 'estates and facilities' [28] or 'non-clinical' staff [33].

Exposure

In the quantitative studies, polymerase chain reaction (PCR) test results were used to identify current infection in four studies [26, 28, 29, 30], venous blood antibodies indicating past infection were used in four studies [26, 27, 29, 30]. Of note, two quantitative studies [27, 28] did not measure evidence of past exposure.

The other studies did not aim to quantify COVID-19 exposure. The mixed-methods study evaluated a recently implemented PPE helper programme at the hospital [33]. One qualitative study explored the impact of a variety of wellbeing interventions (organisational, cognitive behavioural and physical and mental relaxation) that had been implemented across the hospital Trust sites to support staff during the pandemic [31]. The other involved a rapid appraisal of perceptions of clinical and non-clinical hospital staff, working during the pandemic, focusing on the impact of COVID-19 on aspects of care delivery, preparedness and staffing specific to the specialist children's hospital [32].

Findings

Quantitative studies

Five quantitative papers were included [26, 27, 28, 29, 30]. All investigated the prevalence of COVID-19 among different hospital staff groups, using PCR testing for active infection [28], or with additional serology testing for antibodies [26, 27, 29, 30].

A higher prevalence of COVID-19 amongst ancillary staff was found in four studies [26, 27, 29, 30]. This relationship between seropositivity and ancillary role remained following multivariate analysis, in three studies [27, 29, 30]. In the fifth study, the ancillary staff formed a very small proportion of included participants (domestic and portering staff:

n=27/5,697; 0.47%). This small sample size was reflected in the large 95% confidence intervals (domestic and portering staff: seroprevalence (aOR 3.45 [95% CI 1.07-11.42]) [27]. Hence, although statistically significant ($p = 0.039$), the precision is poor and clinical interpretation uncertain.

Quality appraisal (quantitative)

In general, the quality of the quantitative studies was limited by a lack of statistical sample size estimation [26, 27, 28, 29, 30], selection bias due to lack of consecutive samples and use of self-enrolment [26, 27, 28, 29, 30], lack of clarity regarding participant staff roles [27, 28, 29], and lack of adjustment for confounders in one study [28].

Qualitative studies

Two qualitative papers were included [31, 32]. One study conducted a framework analysis of free text data from survey responses evaluating wellbeing interventions implemented at multiple sites within one NHS health board during the pandemic [31]. The other used framework analysis to analyse semi structured interview transcripts of perceptions of clinical and non-clinical hospital staff, working at a specialist children's hospital during the pandemic [32].

Quality appraisal (qualitative)

In the first qualitative paper, the number of ancillary staff participants who took part in the surveys was not disclosed: these staff were placed in arbitrary categories, hindering interpretation [31]. Differences in the phrasing of survey questions could have resulted in response variance and bias. The paper did not include a reflexive statement, making it difficult to assess the researchers' positionality.

The second qualitative paper also categorised ancillary staff unclearly, under 'other staff' [32]. Self-enrolment could have resulted in self-selection bias, and the participants did not include any junior doctors whose experiences may have offered a different perspective. However, sampling was purposive. The framework analysis was undertaken by a team. The paper did not include a reflexive statement, making it difficult to assess the researchers' positionality.

Mixed-methods study

The mixed-methods study [33] used data collected from staff surveys to evaluate a PPE helper programme. The survey invited participants to indicate whether they agreed or disagreed with statements about PPE at the hospital and the effectiveness of the PPE programme. Free-text comments were also invited.

Quality appraisal

Categorisation of ancillary staff was more explicit, with cleaners, porters, and catering staff explicitly grouped as ‘non-clinical support staff’. The study used an unvalidated modified survey tool and self-enrolment could have resulted in selection bias. Additionally, the cross-sectional design did not allow conclusions about a causal effect of the PPE helpers [33].

Key themes and findings

Three top-level themes were developed from the coded data. (see Online Table 5 for details)

Theme 1: Higher prevalence of COVID-19 amongst ancillary staff

There was evidence that COVID-19 infection was higher amongst porters and domestic staff/cleaners, compared with other staff groups.

Outside of the hospital: the contribution of social and economic factors

Hanrath et al. [29] indicate that social and economic factors may play a part, finding that living in areas of greater social deprivation was associated with higher seroconversion. Eyre et al. [30] suggest that job role is a proxy for socio-economic background, noting the association between porters and cleaners and lower socio-economic status:

‘That staff working as porters or cleaners had the greatest adjusted risk of infection is consistent with economics playing a part in risk, potentially reflecting conditions outside of the hospital, for example dense occupancy of living space due to lower incomes’. [30]

‘...there is an emerging picture of higher seroprevalence rates among domestic services workers... the underlying reasons for this are likely to be multifactorial and to include economic and social factors... [29]

Ethnicity seemed to be associated with occupational role and lower socio-economic status [30]. Participants from minoritized ethnic backgrounds were found to be at greater risk of seropositivity than white participants, a finding which remained after multivariate analyses [26]. The Index of Multiple Deprivation was significantly lower for people from minoritized ethnic backgrounds compared with white participants in one study [26]. However, level of *deprivation* was not directly related to serostatus in this study, suggesting the increased risk in this cohort was related to occupational conditions [26].

A larger study found that the increased risk of seropositivity associated with staff from minoritized ethnic backgrounds was independent of job role and could not be explained solely by occupational factors [27]. However, another found no evidence of greater COVID-

19 infection (PCR +) among staff from minoritized ethnic backgrounds [28], but this study did not adjust for other key variables and had fewer data available for ancillary staff.

Inequities in PPE provision

Different levels of PPE provided varying degrees of protection against COVID-19 [26]. In one study, domestic services staff used 'lower' level 1 PPE during the study period [29], which could have placed them at greater risk of contracting COVID-19. In two other studies, although the type of PPE used by ancillary staff was not defined, staff working on ICU/HDU and COVID-19 cohort wards, where enhanced PPE was mandated, had lower infection (PCR+) and seropositivity rates [26, 30]. Public Health England (PHE) guidance was cited as the rationale behind the varying levels of PPE amongst different staff groups [26, 30].

PPE training could have influenced the lower prevalence in intensive care (ICU)/ high dependency unit (HDU) staff, together with enhanced PPE and other conditions, such as space for donning and doffing PPE and greater staffing levels [30]. Where all staff, including domestic services, received PPE training, domestic services still had the highest prevalence of COVID-19 and were noted to have used 'lower' level 1 PPE [29]. Therefore, having training but without access to higher levels of PPE was less effective for preventing COVID-19 infection. In addition, most regular information about accessing and training regarding PPE used online communication, which disadvantaged workers such as ancillary staff who did not routinely use digital means (see Theme 2). It was commented that a lack of intranet access amongst porters, cleaners, and catering staff could have resulted in gaps in adequate PPE training or access to PPE educational resources, which could have placed them at greater risk of COVID-19 infection [33].

Inside the hospital: Increased vulnerability from direct patient contact

Staff with most direct patient contact appeared to have the highest risk, especially for those working in a COVID-19 area [30]. Porters and cleaners had the highest adjusted risk of any group, thought to be because they work in all areas across the hospital [30]. Their risk was greater than staff with closer patient contact but with more restricted working conditions, such as staff working in intensive care [26]. Additionally, ICU staff used enhanced PPE, in comparison to lower-level PPE used by other staff [26, 29, 30]. The combination of moving around the hospital with lower levels of PPE would have increased the risk of ancillary staff contracting and spreading COVID-19 [30].

Theme 2: Marginalisation of ancillary staff

Ancillary staff were marginalised and lacked a voice [31], and experienced inequity of digital modes of communication [32].

Lack of inclusion

Evidence of marginalisation was also seen in some of the quantitative studies and mixed-methods study, where ancillary staff were not distinctly categorised as participant groups [28, 33]. For example, one study included 'Estates and facilities' staff, but did not categorise them further [28], and in another domestic staff and porters were not identified as respondent groups: there is reference to 'estates' and 'non-clinical' staff [33].

'Some staff groups felt excluded from some of the communication points such as huddles, or that their voices were not heard. Many of the staff who felt that they were not heard were non-clinical staff...' [31]

'We focus a lot on medical and nursing, but I think there needs to be more and better recognition for other services on-site: ... domestics, porters etc. All the work we do feels unvalued' [31].

In one study, cleaners and porters were one of the smallest participant groups, but recruitment was via email [27]. Cleaners and porters do not use computers regularly, if at all, in their role and may therefore have limited access to computers on-site [32]. If externally contracted, staff may not have received the recruitment email and the lack of representation from contracted service staff was noted [28].

Lack of voice

The lack of voice and representation by ancillary staff in the NHS can result in limited influence on management actions, negative working conditions and feeling disenfranchised and devalued [31]. Subsequently, their wellbeing could be affected:

'Where groups feel unheard, and therefore unsafe, this impacts their perception of the organisation's psychosocial safety climate (PSC) and may have a detrimental impact on wellbeing' [31].

Establishing a voice within the NHS was perceived as being complex and bound up in organisational hierarchies and power structures, which emulate wider societal constructions [31]. The NHS operates a hierarchical, pyramidal form of leadership [34]. This is reflected explicitly by the staff pay bands; ancillary staff are in the lowest bands [35]. Acknowledging how a lack of power might prevent certain staff from having a voice was deemed crucial; feeling able to influence practices in the workplace is associated with greater engagement, feeling valued, and staff retention [31].

Surveys were recognised as being a useful tool for staff to have a voice within the NHS [31]. The poor representation of ancillary staff in the included survey studies emphasises that they are unheard and lack power [31].

Inequities in access to digital communication

Domestic and portering staff were difficult to reach via digital communication [32]. Staff raised concerns as email became the dominant method of communicating important information, such as the fast-changing regulations and where patients with COVID-19 were located in the hospital [32]. This shift to a virtually exclusive reliance on digital communication with staff was highlighted as reducing access to and understanding of essential information, particularly for staff such as ancillary workers [32]. Consequently, these staff could have been placed at greater risk of COVID-19 infection.

Ancillary staff therefore experienced inequity in terms of access to digital modes of communication [32]. Email became the dominant staff communication method, yet ancillary staff's day-to-day work practices did not involve regular use or access to email [32]. They were therefore difficult to reach and were excluded from crucial information and wellbeing support:

‘...the cleaners and others are excluded from the wellbeing stuff because it’s all online. So even today there’s a dozen wellbeing messages that I’ve printed out and posted on the porters mess room wall. Whether they read them or not I don’t know. It’s difficult. They’re difficult to reach’ [32].

Inequity of benefits of digital modes of communication led to expressions of not feeling valued by the organisation [32]. Unawareness of crucial information communicated via email, such as the location of COVID-19 patients in the hospital, could have placed ancillary staff at greater risk [32].

Lack of support and training

A lack of digital access could also have resulted in inadequate PPE training for ancillary staff, heightening their risk [27, 28, 29]. It was noted that porters, cleaners, and catering staff could have experienced gaps in PPE training and difficulties accessing educational resources [33]. This was attributed to a lack of effectiveness of current information channels, such as the intranet [33].

When non-clinical staff (e.g., domestic staff) *did* have access to a PPE training initiative, they were amongst the most positive group of staff regarding its impact [33]. Across all statements about a PPE helper programme implemented at one hospital trust, non-clinical staff were more likely to agree/strongly agree with the following:

‘PPE helpers have been there to answer my questions about PPE’
‘PPE helpers have helped me to wear PPE appropriately’
‘Overall, PPE helpers have made a difference in how I use PPE’
‘Overall, PPE helpers have made me feel less anxious’ [33]

The PPE helper programme was developed after the infection prevention and control (IPC) team observed suboptimal PPE practice for the first four months of the COVID-19 outbreak in general, which suggests a lack of prior training and support [33]. The positive regard by

ancillary staff could have been due to particular prior neglect of PPE and infection control training. For example, the noted gaps in PPE training due to lack of intranet access [33].

Inequities in PCR testing

Ancillary workers also experienced inequity in terms of PCR testing: they were not prioritised [28]. Externally contracted staff, including cleaning and catering staff, were last to be offered testing out of all the hospital staff [28]. This was attributed to guidance from NHS England and testing capacity [28].

Theme 3. Ancillary staff experienced changes to their working practices

Changes in workload varied across hospital staff groups [32]. Workload increased for domestic staff, including risky tasks, such as cleaning regular touchpoints [32]. Changes to working practices involved taking on tasks that staff were not trained for, sometimes as an extension to their role. For example, the work of porters involved reduced contact with patients, instead shifted to supporting estates and facilities, collecting, and moving supplies, such as PPE [32]. Domestic staff provided more intense emotional support to the parents of patients, in the absence of psychologists [32].

Though changes to workload and practices were not unique to ancillary staff, it was remarked that staff who remained on-site were disproportionately impacted and had to take on extra work [32].

DISCUSSION

Ancillary staff working at NHS hospitals in the UK have been largely overlooked, with only a small number of included studies. However, these studies show that ancillary workers are more likely to have been infected by COVID-19, more likely to work in a high-risk manner across the hospital, near patients, with lower levels of PPE and training in how to use it. Ancillary workers have been crucial to the functioning of hospitals throughout COVID-19, yet our findings indicate that they have been marginalised, experienced poor working conditions, experienced inequity of benefits of digital modes of communication, and lacked priority for PPE and COVID-19 testing. Our findings are consistent with the broader literature and illustrate the intersectionality between ethnicity, socioeconomic status, and low-paid roles in society; the interconnected nature of such categorisations, when applied to individuals or groups create interdependent systems of disadvantage.

Other such groups have experienced similar disadvantages to hospital ancillary staff. Ancillary staff working in care homes are also under-represented in the research literature [65]. Like their hospital counterparts, they experienced changes to work practices and increased workloads, with limited recognition for their work [65]. Care home staff experienced increased workloads and poor access to information and resources [59,60, 64]. PPE access was particularly limited, as supplies needed to be competed for against more powerful organisations, including the NHS [59]. Homecare workers have

been similarly overlooked in the research literature [61]. A small number of relevant studies highlight chronic understaffing, exacerbated by COVID-19, increased workloads, lack of guidance and support, and limited PPE provision [62, 63, 64]. There is a collective sense amongst these groups of feeling unsupported, undervalued, and abandoned by managers, employers, and the government [59,60,63].

Our findings contribute to the growing discourse around diversity, equity, and inclusion within the health and social care workforce. Connecting our findings with the experiences of similarly low-paid healthcare staff helps to uncover a hidden tribe of workers. These workers are invisible, face many disadvantages such as precarious working conditions and low pay, and are largely under-represented across the research literature.

These workers have historically faced multiple disadvantages, well before the pandemic [36]. COVID-19 exacerbated these [37]. Many low-paid workers lack sick pay [38, 63]. Most outsourcing companies contracted by the NHS do not provide sick pay for the first three days [39]. This lack of sick pay could discourage staff with COVID-19 from taking leave and presenting for testing [40], as has been the case amongst adult social care staff [63], undermining infection control measures [41]. Low-paid staff are also more likely to experience 'zero hours' contracts [42]. This job insecurity, the absence of economic stability and low hierarchical positioning in the workplace, makes them vulnerable to poorer working conditions [43].

Hospital ancillary workers have experienced working conditions that have increased their risk of COVID-19: transient working, limited access to crucial information communicated via emails, limited COVID-19 testing, and inadequate PPE training and attire. [28, 29, 30, 33]. Our findings indicate little, or no, prior access of infection control training pre-COVID, in contrast to clinical staff, which could have heightened their risk. These findings are consistent with the experiences of other low-paid staff within the health and social care sector [59, 60,64,65]. With regards hospital settings, the changes in workload and practices observed in our data were not unique to low-paid ancillary staff: for example, doctors were commonly redeployed to unfamiliar areas to meet the changing demands of the NHS [44]. Staff working in roles on-site were required to take on extra work and were unable to shield from the virus by working from home [32]. Frontline staff argued that risk was disproportionately assigned to them, rendering them 'collateral damage', and have described feeling abandoned by management, who gave instructions, advice, and criticisms 'from afar' [45].

Low-paid workers are more likely to experience living conditions that increase susceptibility to COVID-19, such as living in overcrowded areas with limited access to personal outdoor space, hindering compliance with social distancing [46]. Notably, individuals from minoritised ethnic backgrounds are more likely to live in overcrowded housing [66,67], reflecting the intersectionality between ethnicity, socioeconomic status, and low-paid roles.

Limited access to digital technology is also an issue for individuals from socio-economically deprived backgrounds and has worsened since COVID-19 [47]. This could explain some of the inequities in access to digital communication amongst hospital ancillary staff, who may have struggled to access this at home. The consequences could be significant, as individuals have struggled to access information that could keep them safe from COVID-19 and have been prevented from accessing healthcare. The internet has become the dominant means of communication between public authorities and the public. 'Looking for health-related information', booking medical appointments, attending remote medical consultations, and acquiring prescriptions electronically all became commonplace in the response to COVID-19 [49].

Being from a minoritised ethnic background is linked to poverty and social disparities [49], reflecting the interconnected nature of societal disadvantages, and is associated with greater risk of COVID-19 [50]. Individuals from ethnic minority backgrounds are disproportionately employed in roles that carry elevated risk of exposure to COVID-19 [51], including in hospital ancillary roles [52]. The association between socioeconomic status and COVID-19 risk is recognised [46]. In the absence of data, it is suggested that individuals from minoritised ethnic backgrounds are overrepresented in low-paid ancillary roles within the NHS [51, 52, 53].

Reports that low-paid ancillary staff were invisible within the NHS is not surprising. Historically, low-paid workers, such as ancillary staff, have been considered unskilled [36]. During COVID-19, they were recast as 'essential', their roles deemed indispensable, and were better recognised by the public [54]. However, this impact appears to have been shortlived: low-paid health and social care workers have reported feeling invisible and unvalued since COVID-19 [43, 59, 60, 63]. Staff contracted by the NHS from external agencies have been excluded from the recent government pay rise awarded to NHS staff, despite their vital roles in the pandemic [55]. Not only are ancillary staff underrepresented in the published literature, but they are also underrepresented in the annual NHS staff survey. Staff employed by outside contractors, including many ancillary staff, are not invited to participate [17, 43]. The inequity experienced by these staff in terms of digital communication access may also play a part: they may not receive invitation emails or may be unaware of how to navigate the online survey [32]. This exclusion could contribute to ancillary staff feeling unvalued and invisible. It makes it difficult to obtain granular information about domestics, caterers, and porters in particular. Without accurate information, the scale of the issue is hard to delineate, resulting in missed opportunities to mitigate the risk and impact on these individuals.

Strengths and limitations

This review uses a robust search strategy and methods, including double screening, data extraction and quality appraisal. Nevertheless, as with all reviews, we may have missed relevant publications. The review includes a small number of studies, due to the under-researched topic. Some themes therefore emerged from a single paper, which may limit generalisability. However, findings remain highly applicable. Studies were limited to the UK setting, but many findings will be pertinent to other countries, for example in China where the occupational risk of COVID-19 was noted to be higher in cleaning staff and the same concerns were expressed about ancillary workers being poorly valued by management, high workload with low pay, and services often being outsourced [56, 57]. The review exposes the disadvantages of a distinct workforce that is seldom heard in research literature. Beyond this, the findings can be linked to the experiences of other disadvantaged, low-paid staff groups, highlighting a tribe of hidden workers who are overlooked, despite keeping the health and social care system afloat.

Implications for policy, practice, and future research

The pandemic identified key issues that should be addressed. Firstly, ancillary staff must be included in training regarding infection control and use of PPE; they are high risk and work across the hospital in a range of near-patient circumstances. Even if their services are outsourced, connection via email, and intranet should be supplemented by in-person training opportunities, recognising potential lack of access to and skills for IT. Secondly, they should have equal priority for adequate PPE to clinical workers. Thirdly, their voice should be sought actively using ways to engage them that can be used by all. These recommendations extend to other staff groups: it is crucial to recognise that hospital ancillary staff are part of a 'forgotten tribe' of workers, representing many of the disadvantaged groups in the health and social care sector, and beyond.

Beyond the pandemic, an important lesson is the need to value these workers. Fostering a culture of inclusion is key, through practices such as providing realistic opportunities to attend team meetings and ensuring these staff receive key information and guidance. Visible and accessible management who have regular contact with staff is also recommended. All staff must receive appropriate support and training for all aspects of their role. An increase in pay would contribute to staff feeling valued. In the NHS, increased pay has been found to increase job satisfaction, which improved retention [69]. There is also a need for a holistic vision of health and social care in the UK, to reduce inequities between groups of workers, for example varying access to resources.

Further research involving these workers is required to establish how else to support and value them. Their inclusion in research literature is urged, to facilitate understanding of how best to support them through COVID-19 and beyond.

Qualitative studies should explore their experiences in depth. Surveys should use methods of recruitment and data collection which does not disadvantage this group of people and seeks out honest opinion, e.g., not using jargon, clear and accessible information, IT and paper and in-person data collection methods, meticulous attention to confidentiality, taking into account how to communicate to outsourced services. Accurate workforce figures should be collected with sufficient granularity to identify these groups of workers. A review of evidence published from other countries would provide useful comparative data and may identify examples of good practice, for example, a survey of Lebanese hospital domestic workers showed high levels of knowledge and good practice regarding prevention of infection [58].

CONCLUSION

NHS ancillary workers have a higher prevalence of COVID-19 infection compared with other hospital workers. Possible reasons include lack of priority for PPE and training, and lack of prior infection control training. High risk roles across the hospital in patient areas were compounded by the workforce being low paid and poorly valued. Ancillary staff appear to have been marginalised, particularly through the emphasis on digital communication. These findings should challenge NHS managers to ensure the safety of this vital workforce through inclusion in basic provision of infection control training and protective equipment ensuring similar access to clinical staff, even if ancillary services are outsourced.

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Table 1. Table of included studies

Study, Site and Aims	Design	Participants	Data collection	Main results (<i>in relation to RQ</i>)
<p>Cooper et al. 2022 [27] England</p> <p>Tertiary referral centre and teaching hospital</p> <p>To describe the risk factors for SARS-CoV-2 infection in UK healthcare workers</p>	<p>Cross-sectional study</p> <p>Voluntary self-enrolment</p>	<p>Range of staff groups working at one UK teaching hospital</p> <p>N = 5,697</p> <p>Administrative n=412; Nursing staff n=3471; Junior doctor n=118; Consultant n=174; Healthcare assistant n=319; Theatre staff n=24; Physiotherapist n=84; Domestic and porter n=27; *Other n=1068</p> <p><i>*Other not defined</i></p>	<p>Quantitative: serology testing measured past infection of COVID-19</p> <p>Data collected (<i>self-reported via questionnaire</i>) on demographic information and COVID-19 history: role, ethnicity, previous symptoms consistent with COVID-19, and previous results of SARS-CoV-2 PCR testing</p>	<p>Domestic and portering staff had significantly higher seroprevalence (aOR 3.45 [95% CI 1.07-11.42]; p=0.039) than all other 8 staff groups after adjusting for age, sex, ethnicity, and COVID-19 working location</p> <p>(Range: Other aOR 1.06 [95% CI 0.62-1.80]; p=0.85] to Theatre Staff aOR 2.40 [95% CI 0.65 – 8.87; p=0.19)</p>
<p>Eyre et al. 2020 [30] England</p> <p>Large teaching hospital</p> <p>To identify differential occupational risks to healthcare workers from SARS-CoV-2</p>	<p>Prospective cohort study</p> <p>Voluntary self-enrolment</p>	<p>Range of staff groups working at one UK teaching hospital</p> <p>N = 13,800</p> <p>Administrative staff n=1218; Biomedical scientist and laboratory staff n=354; Senior Doctor n=704; Junior Doctor n=853; Nurse / Healthcare assistant n=3971; Other allied health professional n=622; Porters and</p>	<p>Quantitative: PCR/serology testing measured current presence/past infection of COVID-19 in staff members</p> <p>Data collected (<i>self-reported via questionnaire</i>) on symptoms and potential risk factors</p>	<p>Positive results were more likely in porters and cleaners (aOR adjusted for working in a COVID-19 facing area (2.06 [1.34–3.15]))</p> <p>Porters and cleaners had the highest (proportion) rates of COVID-19 infection (60/323, 18.6%) compared with all other 9 staff groups</p> <p>(Range: Administrative staff (88/1218, 7.2%) to Physiotherapist, occupational, and speech and language therapists (47/ 316, 14.9%))</p>

		cleaners n=323; Physiotherapist, Occupational therapist, Speech and Language therapist n=316; Other n=1452; Undisclosed/Unknown n=3987	(e.g. confirmed household contact)	On univariable analysis staff with most direct patient contact were at increased risk including porters and cleaners
Zheng et al. 2020 [28] England London Large NHS university teaching hospital To examine the characteristics and transmission dynamics of SARS-CoV-2 in Healthcare Workers	Repeated cross-sectional study	Range of staff working at a University Teaching Hospital N=1,045 Emergency medicine n=231; Acute medicine n=538; Cardiothoracic n=195; Cardiology n=271; Renal, oncology and palliative medicine n=355; Specialist medicine n=385; Surgery n=718; Neurosciences n=616; Pathology n= 493; Diagnostics (including radiology) n=425; Estates and facilities n=340; Anaesthetics and theatres n=645; Therapies n=309; Outpatients n=440; Children's services n=742; Critical care n=428; Women's services n=414; Pharmacy n=268	Quantitative: PCR testing measured current presence of COVID-19 infection in staff members Staff and laboratory records were used to locate information on department/ Job role/ demographics Results combined to identify staff sickness and current COVID-19 infection rates	Estates and facilities: of 340 staff, 13 diagnosed with COVID-19 (3.8%); ranking 8 th out of 18 staff groups (<i>in terms of proportion of staff diagnosed</i>) (Range: Lowest: Pharmacy (268 staff, 5 diagnosed -1.9%) to Highest: Emergency medicine (231 staff, 40 diagnosed - 17.3%))
Shields et al. 2020 [26] England NHS	Cross-sectional study	Range of staff working at one NHS University Hospital Trust N=545	Quantitative: PCR/ serology testing measured past and current presence of	SARS-CoV-2 seroprevalence greatest among staff working in housekeeping (*34.5%, n=10/29) <i>*Following multivariate analysis (aOR 1.01 [0.31-3.09] p=0.99)</i>

<p>Foundation Trust: hospitals and specialist clinics</p> <p>To determine the rates of asymptomatic viral carriage and seroprevalence of SARS-CoV-2 antibodies in healthcare workers</p>	<p>Voluntary self-enrolment</p>	<p>In acute medicine, Emergency department, Estates, General internal medicine, General surgery, Facilities, Housekeeping; Intensive care, Obstetrics and gynaecology, Research and development – all n=unknown</p>	<p>COVID-19 infection in staff members</p> <p>Self-reported illnesses in previous 4 months</p> <p>Ethnodemographic data (<i>inc. indices of deprivation</i>) collected</p> <p>Postcode data used to determine deprivation index from the Ministry of Housing, Communities and Local Government</p>	<p>For comparison: acute and general medicine above 30%, but less than housekeeping; lower in intensive care (14.8%)</p> <p>Increased RR of seropositivity for staff working in housekeeping: (RR 2.34, CI 1.07 to 5.01, p=0.03)</p> <p>No significant differences in seropositivity associated with deprivation scores, suggesting high seroprevalence more likely to be associated with job role as opposed to external factors</p> <p>Significant relationship between housekeeping role and seropositivity was lost with multivariate analysis</p>
<p>Hanrath et al., 2021 [29] England</p> <p>One NHS Foundation Trust: two hospital sites inc. tertiary referral centre, community sites, and one offsite non-clinical hub</p> <p>SARS-CoV-2 PCR and antibody testing in the healthcare worker population, and associated factors with SARS-CoV-2 test positivity</p>	<p>Repeated cross-sectional study</p>	<p>Range of staff working across sites (<i>inc. community and non-clinical hub</i>) at a large NHS foundation trust</p> <p>N = 17,126</p> <p>Admin and managerial (non patient-facing) n=2530; Allied health professionals n=1681; Clerical (patient-facing) n=415; Dental hospital staff n=358; Doctors n=1,746; Domestic services n=813;</p>	<p>Quantitative: Analysis of existing data - PCR/serology testing measured current presence/past infection of COVID-19 in staff members</p> <p>Demographic information extracted from Electronic Staff Record (ESR): age, gender, ethnicity, staff role, postcode of all employed HCWs</p>	<p>Initially significant relationship between housekeeping role and seropositivity was lost following multivariate analysis</p> <p>Odds of having a positive serology/antibody and PCR test were greater for domestic services (OR 3.32, 95% CI 1.98-5.56) than for all other 11 staff groups</p> <p>(Range – Pharmacy (OR 0.89, 95% CI (0.2-3.98) to Healthcare Assistants (OR 2.05 (1.34-3.14))</p> <p>Domestic services staff <u>and</u> porters (<i>as a combined group</i>) remained significant after adjustment for exposure to COVID- 19</p>

		Estates and catering n=517; Healthcare assistants n=2,351; Lab scientists n=643; Nurses and midwives n=5,536; Pharmacy n=304; Porters n=232)	Postcode data used to determine deprivation index from the Ministry of Housing, Communities and Local Government	Increased test positivity rates were observed in HCWs from BAME backgrounds and residents in areas of higher social deprivation Multiple logistic regression model adjusting for ethnicity and social deprivation confirmed significant increases in the odds of testing positive in domestic staff
Castro-Sánchez et al. 2021 [33] England Large NHS hospital trust in London (<i>group of hospitals</i>) To evaluate a PPE Helper Programme	Cross-sectional study: Evaluation of PPE helper programme	Range of staff working on, or 'visiting', the wards at a large NHS hospital trust N=261 Nurses n=166; Medical/AHP n=44; Non-clinical support staff* n=41; Unknown/undisclosed n=10). <i>*including catering staff, porters, cleaners</i>	Mixed-methods: Questionnaire) informed by Theoretical Domains Framework and COM-B model Quantitative; descriptive and non-parametric statistics Qualitative free-text thematic analysis	Non-clinical staff (<i>inc. catering staff, porters, cleaners</i>) were the most positive about PPE helpers The benefits of the PPE helpers were deemed greater among non-clinical workers (<i>inc. catering staff, porters, cleaners</i>) Fewer non-clinical respondents than nurses, doctors, and AHPs
Clarissa et al. 2021 [31] Scotland NHS health board in Scotland (multiple sites, including acute hospitals and mental health services) To understand the experiences of NHS staff	Qualitative research design Framework analysis: synthesis of multiple sources of data	Range of frontline staff working within one NHS health board in Scotland N=1,123 (known) Acute hospital 1: Unknown/undisclosed n=128; Acute hospital 2: Clinical/Admin/Management n=257;	Qualitative: Free-text comments of eight different surveys (<i>secondary data - conducted/collected by NHS health boards</i>)	Smaller number of non-clinical survey respondents than nurses, doctors, and AHPs Participants wanted recognition of non-clinical staff (<i>domestics, porters</i>) by managers Recognition by some respondents that staff such as domestics and porters had little voice Ancillary workers are not identified in the respondent groups

relating to the provision of wellbeing interventions between March and August 2020	Existing data collected across NHS board	Acute hospital 3: Clinical/Admin/Estates n= 210; NHS Board-wide: doctors in training n=151;		Their lack of voice and powerlessness was reflected in the discussion (<i>other staff, e.g. laboratory, picked up but not porters, domestics, or caterers</i>)
<p>Aldiss et al., 2023 [32] London</p> <p>Specialist children's hospital</p> <p>A rapid appraisal of perceptions of clinical and non-clinical hospital staff, working during the pandemic, focusing on the impact of COVID-19 on aspects of care delivery, preparedness and staffing specific to a specialist children's hospital</p>	Qualitative study: qualitative rapid appraisal	<p>Range of clinical and non-clinical staff at a single specialist children's hospital</p> <p>N=36</p> <p>Nurses n=19; Medical staff (all consultants) n=7; Other staff groups (radiographers, managers, play staff, schoolteachers, domestic and portering staff, social workers) n=10</p>	<p>Qualitative: One-to-one in-depth telephone interviews (<i>semi-structured</i>)</p> <p>Data analysed using team-based framework analysis</p>	<p>Work practices changed due to COVID-19:</p> <p>Cleaning work intensified</p> <p>Domestic staff became more involved in interacting with and supporting parents, as they remained on-site</p> <p>Porters had less workload associated with patients and assisted estates and facilities with moving and collecting supplies, such as PPE</p> <p>Inequity of benefits of digital modes of communication was experienced by porters and domestic staff did not regularly use or have access to email</p> <p>Other staff members attempted to communicate wellbeing messages to porters by posting physical copies of wellbeing messages on their mess room walls</p>

