Patient-facing healthcare workers and their families have a higher risk of hospital admission with COVID-19 than the general population

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Implications for practice and research

- Organisations should develop policies such as redeployment and equitable work distribution for healthcare workers (HCW) based on risk exposure to COVID-19.
- Future research should focus on defining the risk for HCW based on degree of exposure.

Context

The COVID-19 pandemic has brought to the fore the importance of identifying the risk of infection in healthcare workers (HCW) and their families.[1] Estimating the relative risk of these populations is important for formulating public health measures, maintaining a functioning healthcare system and controlling rates of secondary transmission in the community.[2] Previous studies have not given a clear idea of the extent of risks due to small sample sizes, selection bias and recording of disease.[1] In this study, Shah *et al* evaluated the risk of admission to hospital with COVID-19 among HCW and their household members using national health databases and well-established health record linkage systems available in Scotland.[3]

Methods

Shah *et al* conducted a nationwide linkage study among a cohort of HCW data obtained from databases and linked to the Community Health Index (CHI) database. CHI provided a unique patient identifier number to identify SARS-CoV-2 testing, admissions and deaths among HCW. Selected variables were then appended to existing Scottish case–control study, for comparisons with the general population using a nested case–control design. The primary outcome was admission to hospital with COVID-19 and secondary outcomes were admission to intensive care and death occurring within 28 days of first testing positive. HCW were categorised into patient facing, nonpatient facing and undetermined, to avoid nondifferential misclassification. Patient-facing roles were further classified as front door (paramedics and others), intensive care or risk of aerosol exposure and others.

Findings

This linked cohort study included 158 445 HCW (78.7% women) and 229 905 household members (38.4% women). 57.3% of HCW were patient facing, 20.6% were nonpatient facing and 22.2% were undetermined. In these respective groups, the risk of admission to hospital with COVID-19 was 0.20%, 0.07% and 0.11%. Sub-group analysis after adjustment for covariates showed patient-facing workers were at a higher risk of hospital admission (HR 3.30, 95% CI 2.13 to 5.13) when compared with nonpatient facing. A similar trend was also noted among household members of patient-facing HCW (HR 1.79, 95% CI 1.10 to 2.94). Interestingly, there was lower rates of admission to intensive care units (12.3%) and fewer deaths (2.5%) among HCW.

Compared with the general population, nonpatient-facing HCW and their household members were at a similar risk to general population, even after adjusting covariates. Based on Cox models, after adjusting variables, absolute risk at 90 days remained low at 0.5%.

Commentary

HCW and their household members accounted for one in six of all admissions with COVID-19 in the working age population (18–65 years) at 11.6% and 5.6%, respectively. Risk of admission was threefold and twofold greater, respectively, than the general population, more profoundly seen in patient-facing, 'front-door' specialists.[3] Relative risk was also noted to increase over time between March and June 2020 among frontline HCW, raising concerns in terms of both the risk to staff and the risk of transmitting infection to the wider community. Houlihan *et al* showed that front door HCW had highest risk of admissions with COVID-19, probably reflecting higher seroprevalence in this group.[4] Such risk also increases the susceptibility of household members, and this needs to be considered when assessing occupational risk. Nonpatient-facing and undetermined groups, along with their family members, showed no additional risk compared with the general population. Redeployment of HCW from patient-facing to nonpatient-facing responsibilities needs to be considered, and equitable distribution among all available personnel may decrease risk exposure, particularly in workers and households that are clinically vulnerable.

Major limitations are excluding highest risk population of >65 years age and an inability to define the degree of exposure in subgroups. Mortality risk could not be compared with general population due to low numbers. However, Shah *et al* focused on the important issue of HCW's occupational risk and the additional risk to their families. Understanding and formulating policies directed to protect frontline, patient-facing HCW is necessary to optimise safety in the workplace.

Competing interests None declared.

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References

1 **Chou R**, Dana T, Buckley DI, *et al*. Epidemiology of and risk factors for coronavirus infection in health care workers: a living rapid review. *Ann Intern Med* 2020;**173**:120–36.
2 **Adams JG**, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. *JAMA* 2020;**323**:1439–40.
3 **Shah ASV**, Wood R, Gribben C, *et al*. Risk of hospital admission with coronavirus disease 2019 in healthcare workers and their households: nationwide linkage cohort study. *BMJ* 2020;**371**:m3582.
4 **Houlihan CF**, Vora N, Byrne T, *et al*. Pandemic peak SARS-CoV-2 infection and seroconversion rates in London frontline health-care workers. *Lancet* 2020;**396**:e6–7.