

A Note on Immunization Take-up and Adequacy in UK

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Editorial

The impact of COVID-19 vaccination on new COVID-19 cases was investigated using survival analysis. The outcome variable was time to infection, which was calculated as the time between vaccination and the onset of symptoms or the time of the first positive test if asymptomatic. For partially vaccinated HCWs, a start date of 15 January 2021, coinciding with the end of the RNOH vaccination programme, was used. All HCWs who were not infected on February 26, 2021 were censored. HCWs who had previously received the BNT162B2 vaccine were included in the study. HCWs who reported receiving a different COVID-19 vaccine at the time of follow-up were excluded. Cumulative hazards for partially vaccinated and unvaccinated groups were plotted using the Kaplan–Meier method.

The phase 2/3 safety and efficacy study of the BNT162B2 vaccine revealed that COVID-19 vaccination had no effect on COVID-19 infections until day 14 after vaccination³. This means that the hazards are unlikely to be proportional statistically. There may be no effect for the first 13 days, followed by an effect after that. Two sets of analyses were run to account for the possibility of non-proportional hazards. The first set of comparisons compared the groups from day 0 to day 13. A second set of analyses compared the groups beginning on day 14 and continuing until the end of the follow-up period. Because of the survival nature of the outcome, the analyses for both time periods were carried out using Cox regression.

Initially, a simple 'unadjusted' comparison was made between the partially vaccinated and unvaccinated groups. Following that, the groups were compared while controlling for demographic details that were discovered to differ significantly between groups. The risk ratios were also adjusted to account for the underlying COVID-19 infection rates in the London area. This was treated as a time-varying covariate, with different values assigned to each day of the study period. SPSS version 25.0 was used for statistical analysis (IBM, Chicago, IL). HCWs who had been partially immunised had a 70.0 percent reduction in the risk of symptomatic and asymptomatic infection lasting up to 42 days. The overall uptake of a single dose of BNT162b2 vaccine was 62.3 percent; however, there were significant differences between groups in uptake.

Males were more likely to be partially immunised, and the proportion of HCWs who were partially immunised increased with age. Nursing and clinical support staff had lower rates of uptake, but portering, domestic, and catering

staff had the lowest rates, all of whom are at risk of coming into close contact with COVID-19 patients or their environment.

It was notable that uptake was lower among black and Afro-Caribbean employees, as well as those of mixed heritage. This is concerning because these groups have been disproportionately harmed by COVID-19 and continue to be at risk. Furthermore, these groups are over-represented among the staff groups mentioned above. Furthermore, when compared to the rest of the UK, London has a higher proportion of staff from these groups, which may have an impact on health service levels.^[1-5]

While the uptake of the first dose of BNT162b2 in our study is encouraging, the current rate is unlikely to provide complete protection against nosocomial spread. On a population level, it is unclear what proportion of the population must be vaccinated in order to confer herd immunity. Several estimates place the proportion between 70 and 80 percent across a population; however, hospital populations are dynamic, with patients, often accompanied by relatives or caregivers, changing frequently and staff frequently working across multiple sites. As a result, other infection control measures, such as screening, pre-admission isolation, social distancing, and the use of personal protective equipment, are likely to remain important in reducing the risk of exposure in these settings.

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