Evidence Brief: Risk Matrix for Health Worker exposure to COVID-19 in the workplace.

Background

The risk matrix was developed to provide consistent advice for health workers who have had contact with COVID-19 in the workplace. It aims to balance the need to protect staff, to provide reassurance that appropriately worn PPE[1] and vaccination are protective and to encourage rational PPE use while maintaining essential patient care.

The risk matrix stratifies risk based on intensity and duration of contact, the type of personal protective equipment that has been used and whether there have been any breaches in PPE and has four levels of risk. This is different from the risk assessment for community contact where risk is classified as either close or casual.

The first version of the matrix did not include vaccination status of the staff member. This is now included as vaccination does provide an additional layer of protection from infection. Literature relevant to the risk matrix is being continually reviewed and the matrix will be revised if the evidence to support change is available.

The risk matrix also recognises that in the face of a pandemic the search for perfect evidence may be the enemy of good policy.

Literature Review

When considering which information would apprise the matrix, the following questions were considered:

1. What is the incubation period/transmission dynamics of Delta?
2. What protection is provided from vaccination?
    1. From infection
    2. From onwards transmission
3. Does vaccination change the latent and/or incubation period?
4. What is the viral load/replication of COVID-19 in those who are vaccinated?
5. Does vaccination reduce symptoms if COVID-19 infected (and thereby reduce the risk of transmission)?

[1] The appropriate use of PPE is determined by whether CEC advice re PPE being followed for that situation

6. What protection do masks provide both from acquisition and from onward transmission of Delta?
7. Other specific risks or considerations for health workers?

Transmission dynamics - Delta

The Delta outbreak is relatively new and information about transmission continues to evolve. The incubation period (time of exposure to time of symptoms) is on average about 6 days[1]. It is clearly more transmissible with viral load up to 1000x higher than the Wuhan strain[2]

Vaccination

1) Vaccination provides very good protection from infection, as well as from symptomatic and severe illness with SARS-CoV-2[3-9]
2) If vaccinated and infected with COVID-19, onwards transmission appears to be substantially reduced[10]. However, most of the available publications consider onward transmission with Alpha and not Delta, with one recent publication showed that index cases **without** vaccination were 6 x more likely to transmit Delta than those who were vaccinated[1].

Vaccination and incubation/latent period

There was no information available on whether vaccination impacts incubation or the latent period of Delta.

Vaccination and COVID-19 infection

3) Vaccinated people who get infected with COVID-19 (Delta) appear to have the same initial viral load as those who are unvaccinated but are much less likely to have symptomatic or severe disease. They also appear to have a much shorter period of viral replication[1,2]

4) There are concerns about waning immunity which is more significant in people over the age of 65 and those who are significantly immunocompromised[11,12,13]. Information about waning immunity and risk of COVID-19 is being closely monitored[14]

5) If vaccination reduces symptoms (in particular coughing) if infected with COVID-19, then it may contribute to a reduction in onward transmission. However, asymptomatic transmission occurs and there are no publications that provide further insight into this question.

Other risks for Health Workers

6) Health worker to heath worker infections comprised a reasonable proportion of infections in a number of publications[15, 16] and any risk matrix needs to include a process for assessing this risk as well as risk from patient contact or care[17].

7) There are additional considerations around likely density of exposure[16] i.e., size of the room/space and ventilation, and the recognition this is difficult to measure.

8) There is no consensus or definitive list of aerosol generating procedures (AGPs) in healthcare settings.[18, 19] The World Health Organization has published recommendations for healthcare workers performing aerosol-generating procedures.[20]

9) Aerosol generating behaviours are natural processes associated with a risk of airborne transmission of SARS-CoV-2 and include coughing, singing, and sneezing.[20]

Protective effect of masks and eye wear

10) The wearing of surgical and/or P2/N95 masks has been shown to significantly reduce the amount of infected droplets and aerosols released into the surrounding air and have been shown to prevent transmission from health workers to patients if wearing these masks while infected[21-26].

11) The appropriate use of PPE is protective for health workers when combined with other controls against SARS-CoV-2[25,26]

12) Eye protection is important in reducing transmission risk as are other non-pharmaceutical interventions in the community[26,27]

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