

In brief

Hospitalisation and ICU admission – relative risk for vaccinated versus unvaccinated people

4 November 2021

Summary

- There is a wealth of [evidence](#) to show available vaccines are effective against SARS-CoV-2.¹
- Published studies show the effectiveness of different vaccines at preventing hospitalisation. The numbers are as follows:
 - 71% to 97% Comirnaty (Pfizer)
 - 73% to 95% Vaxzevria (AstraZeneca)
 - 91% to 97.5% Spikevax (Moderna).²⁻⁶
- Data from the patient flow portal, which provides a census of patients under the care of NSW Health each day, shows that the majority of patients who are in the intensive care unit (ICU) with COVID-19 are unvaccinated or only partially vaccinated. For example, of the 717 people in hospital on 12 Oct, 63% were unvaccinated, 23% partially vaccinated and 14% were fully vaccinated. Of the 148 in ICUs, the proportions were 72% unvaccinated; 20% partially vaccinated; 8% fully vaccinated (see also Figure 1).
- Between [16 June and 25 September](#), there were 298 deaths among locally-acquired Delta cases in NSW. Of those, 77% were unvaccinated, and 11% were fully vaccinated (9% partially and 3% under investigation).⁷
- The effectiveness of vaccines can be assessed by comparing the risk of being admitted with COVID-19, either to hospital or to the ICU, among vaccinated and unvaccinated people.
- Using this approach to assess the 16+ population in NSW on 10 October, those who were unvaccinated had a **24-fold higher** risk of hospitalisation and a **46-fold higher** risk of being admitted to the ICU than the fully vaccinated population.
- Differences in relative risk are even more marked in the 40-59 age group, with a **47-fold higher** risk of hospitalisation and **70-fold higher** risk of ICU admission in the unvaccinated compared to the fully vaccinated population.
- From a methods perspective, the 16+ years result is age-standardised; a two-week lag is applied to the vaccinated population rate to allow for the vaccine to take effect; and hospitalisation and ICU admissions are calculated as seven-day rolling averages.
- The above are dynamic indicators, with the denominators (the vaccinated and unvaccinated populations) changing rapidly; and rapid changes in patterns of circulating cases*; however, the marked impact on risk is seen consistently when there are incident cases.
- Relative risk has also been calculated in other jurisdictions, including [Ontario](#), [Quebec](#) and [California](#), demonstrating similar patterns of profound changes in the risk of hospitalisation and admission to ICU with COVID-19.⁸⁻¹⁰

* For example, on 2 October among the 16+ years age group, people who were unvaccinated had **61-fold higher** risk of ICU admission.

Tables and Figures

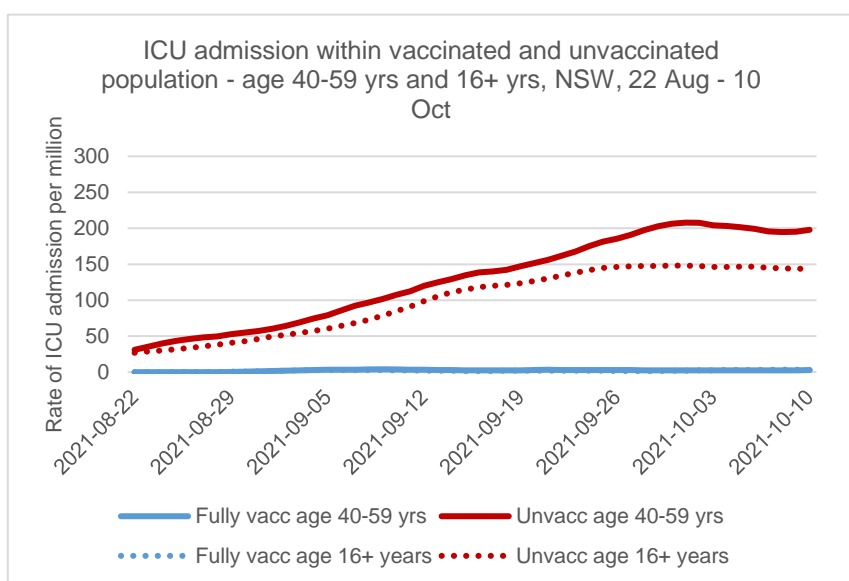
Figure 1: Descriptive data – vaccination status ([NSW Health weekly epidemiology report](#)) ⁷

Table 9. Hospitalisations, ICU admissions and deaths among locally acquired cases diagnosed with COVID-19, by vaccination status, NSW, from 16 June to 25 September 2021

Vaccination status	Hospitalised (%)	Hospitalised and in ICU (%)	Death (%)
Fully Vaccinated	369 (4.6%)	19 (1.9%)	32 (10.7%)
Partially vaccinated	477 (5.9%)	56 (5.7%)	28 (9.4%)
No effective dose	5,351 (66.3%)	639 (65.1%)	228 (76.5%)
Under investigation	1,878 (23.3%)	267 (27.2%)	10 (3.4%)
Total	8,075 (100.0%)	981 (100.0%)	298 (100.0%)

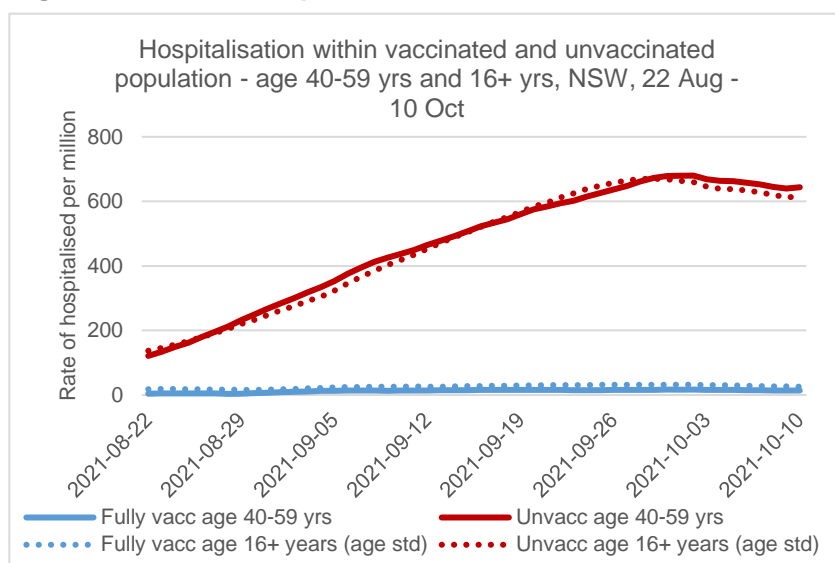
Interpretation: Of the 8,075 people hospitalised, 369 (4.6%) had received two effective doses, 477 (5.9%) had received one effective dose, and 7,229 (89.5%) had either received no effective doses or vaccination status has not yet been determined. The 32 deaths among people fully vaccinated were two people in their 50s, ten people in their 70s, ten people in their 80s and ten people in their 90s.

Figure 2: Risk of ICU admission



Age group	Risk of ICU admission Unvaccinated population against fully vaccinated population (date 10 Oct)
16-39 yrs	39.3
40-59 yrs	70.3
60+ yrs	36.5
16+ yrs age std	46.2

Figure 3: Risk of hospitalisation



Age group	Risk of hospitalisation Unvaccinated population against fully vaccinated population (date 10 Oct)
16-39 yrs	26.8
40-59 yrs	46.6
60+ yrs	17.9
16+ yrs age std	23.5

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