



Real World Evidence for COVID-19 Vaccines

CLINICAL QUESTION

What is the real-world effectiveness for currently available COVID-19 vaccines?

BOTTOM LINE

Similar to clinical trials, real world cohort and case-control studies find COVID-19 infections are reduced by >90% with two doses of mRNA vaccines. Single doses of either mRNA or AstraZeneca vaccine decreases infections by ~60% and hospitalizations by 70-80%. Vaccine effectiveness appears similar for variants of concern and are safe for pregnant women.

EVIDENCE

- From relatively short cohort/case-control studies or registries. Fully vaccinated defined as 7- or 14-days post-second dose.
- Israel national vaccination (Pfizer) program of 6.5 million adults ≥ 16 years old.¹ New COVID-19 cases in the program's initial 10 weeks was compared to vaccine status. Full vaccination decreased risk of:
 - All COVID-19 infections: By 97%.
 - Hospitalizations and deaths: By 98% and 99% respectively.
 - Limitations: The same individuals contributed time to unvaccinated, partially vaccinated and fully vaccinated calculations.
- United Kingdom case-control study, persons ≥ 70 years with COVID-19 (n=44,590) linked to vaccine status.² Single dose of either Pfizer or AstraZeneca reduced:

- Symptomatic infections: ~60% (~1 month after either vaccine).
- Hospitalizations: 80% (either vaccine).
- Death: ~85% [Pfizer (AstraZeneca death rates not reported)].
- Ontario four-month case-control study, adults ≥16 years:³
 - Single-dose (Pfizer or Moderna) reduced:
 - Symptomatic infection: 60%.
 - Hospitalization or death: 70%.
 - Two-doses reduced:
 - Symptomatic infection: 91%.
 - Hospitalization or death: 98%.

CONTEXT

- Findings similar to clinical trials.⁴
- Variants of Concern (VOC):
 - Two doses of Pfizer or AstraZeneca reduces symptomatic delta variant infections or hospitalizations similar to non-VOC infections.⁵
 - Pfizer or Moderna vaccination reduces symptomatic infection or hospitalizations in four current VOC (alpha, beta/gamma, delta) similar to non-VOC.⁶
 - Two doses are better than one.⁶
- Safety in Pregnancy:
 - 35,691 pregnant women received Pfizer or Moderna vaccine (29% 1st trimester, 43% second trimester, 26% third trimester):⁷
 - Adverse pregnancy outcomes with vaccine same as baseline risk.⁷
 - Babies born to pregnant women with COVID-19 are twice as likely to develop severe perinatal morbidity and mortality.⁸
 - Pregnant women with COVID-19 have 50% greater risk of maternal morbidity or mortality.⁸
- Pregnant women should be offered COVID-19 vaccine.⁹
- Recommendations for vaccinated individuals available: [Canada](#) or [United States](#)^{10,11}

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