

How Effective Are COVID-19 Inactivated Vaccines Against Omicron?



Vaccine effectiveness (VE) is how vaccines work in the real world (not just in clinical trials)

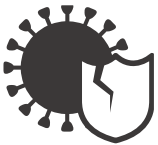
WHO-Authorized inactivated vaccines:

Sinovac, Beijing CNBG, Bharat BioTech

Other inactivated vaccines with country approvals:

Chumakov, Shifa Pharmed, Kangtai Biologicals and RIBSP

Key Facts



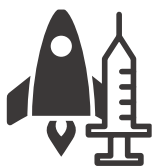
Evidence is limited and most is for:

- This evidence suggests that COVID-19 inactivated vaccines **protect against severe disease BUT poorly protects against infection** with Omicron.



Effectiveness of the primary vaccination series:

- Protection against Omicron symptomatic disease (of any severity) is LOW.
- Protection against Omicron severe disease is better than for symptomatic disease and lasts for many months.



After a booster shot (3rd dose) of an inactivated vaccine:

- Protection against Omicron symptomatic disease remained LOW with a booster dose of inactivated vaccine.
- Protection against Omicron severe disease improves to >70% and lasts for several months.

After a booster shot with an mRNA vaccine:

- Protection against Omicron severe disease and symptomatic disease improved substantially but drops quickly for symptomatic disease.



COVID inactivated vaccines have no evident safety concerns and severe reactions are rare. However, Bell's Palsy is possibly associated with inactivated vaccines.

COVID-19 Inactivated Vaccine Effectiveness Against Omicron

How Effective Are Inactivated Vaccines in the General Population?

Inactivated primary series



Sinovac
Beijing CNBG
Bharat BioTech

	Severe Disease/ Hospitalization/Death	Symptomatic Disease	Infection
Sinovac	56-84% ₇	12-28% ₂	0-23% ₂
Beijing CNBG	No Omicron data	No Omicron data	No Omicron data
Bharat BioTech	No Omicron data	No Omicron data	No Omicron data

Inactivated primary series + Inactivated booster



Sinovac + Sinovac

Sinovac + Sinovac	74-97% ₅	9-42% ₂	32% ₁
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Inactivated primary series + mRNA booster



Sinovac + BioNTech Pfizer

Sinovac + BioNTech Pfizer	57-96% ₆	56-64% ₃	31% ₁
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Note: values represent the range of estimates found across all eligible studies evaluating VE within 3 months of final dose among the general population (detailed methods [here](#)). Subscript represents the number of estimates in range.

How Long Do Inactivated Vaccines Protect Against Omicron?

- MORE EVIDENCE IS NEEDED -

Evidence from just 3 studies so far shows:

SEVERE DISEASE

- Vaccine effectiveness (VE) of **2 doses of Sinovac** against severe disease lasted for at least 10 months post vaccination.
- The increased VE of a **booster dose of Sinovac** against severe disease was mostly sustained at ~4 months post booster.
- Protection from a **booster of mRNA vaccine** after 2 doses of Sinovac was also sustained at ~4 months post booster.

SYMPTOMATIC DISEASE

- There was **NO** durable protection observed from either **2 or 3 doses (i.e., booster) of Sinovac** against symptomatic infection.
- A **booster dose of mRNA vaccine** after 2 doses of Sinovac also provided no durable protection.

How Effective Are Inactivated Vaccines Against Omicron In Special Populations?



CHILDREN: Vaccine effectiveness (VE) of 2 doses against severe outcomes was available for Sinovac and Beijing CNBG and ranged from 59-69%. VE of Sinovac against symptomatic infection was 40% and was 38% against any infection. No evidence is available for other inactivated vaccines. No booster data were available.



PREGNANT WOMEN: There are NO data on VE against Omicron in pregnant women. VE of Sinovac for Gamma and Delta variants against symptomatic infection and hospitalization was similar to that of the general population.



OLDER ADULTS: In adults ≥ 65 years, 2 doses of Sinovac had between 55-73% protection against severe disease or death caused by Omicron (data from 2 studies); a booster dose of BioNTech Pfizer improved protection to between 89-96% (3 studies), which was slightly better protection than with 3 doses of Sinovac.



HEALTHCARE WORKERS: There are no studies of inactivated vaccines against Omicron in healthcare workers. Pre-Omicron, primary series VE among healthcare workers was 39-51% against infection (3 studies of Sinovac and Beijing CNBG), 46-57% against symptomatic disease (1 study of Bharat BioTech), and 65% against hospitalization (1 study of Beijing CNBG).



VULNERABLE POPULATIONS: In one study of patients with chronic kidney disease who could have been vaccinated anywhere from 14 days up to 1 year, VE of 2 doses of Sinovac was 4% against infection, 44% against hospitalization, and 70% against death. A third dose of Sinovac improved VE to 61%, 65%, and 97%, respectively.

What We Don't Know About the Effectiveness of Inactivated Vaccines

There is limited evidence overall on how well inactivated vaccines protect against Omicron; however, data is especially sparse for the following:

FIRST BOOSTER DOSE PROTECTION IN CHILDREN: We don't know how well a booster dose of any vaccine following primary series of inactivated vaccines protects children against Omicron infection or disease.

SECOND BOOSTER DOSE PROTECTION IN CHILDREN: Data are limited on how well a second booster dose of any vaccine following regimens that include inactivated vaccines protects against Omicron infection or disease. In one study, 3 doses of Sinovac followed by a dose of mRNA vaccine showed 75% VE against ICU admission and 79% VE against death; VE estimates were slightly higher when the first booster dose was either AstraZeneca or mRNA instead of Sinovac.

PROTECTION AGAINST TRANSMISSION: We don't know if inactivated vaccines can prevent onward transmission of Omicron.

VE OF SPECIFIC INACTIVATED VACCINES: There is limited data on how well other inactivated vaccines (e.g. Bharat Biotech, Beijing CNBG, Wuhan CNBG) protect against infection, symptomatic and severe disease caused by the Omicron.

VULNERABLE POPULATIONS: There is limited data on how well inactivated vaccines perform in immunocompromised and vulnerable populations (*see Special Populations section above*).

OMICRON SUB-VARIANTS: We don't know how well the inactivated vaccines work against Omicron BA.4 and BA.5, currently the most common sub-variants.