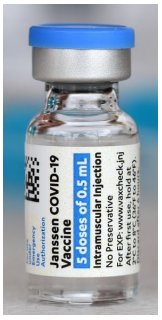
Vaccine efficacy

- Vaccine efficacy measures the proportionate reduction in cases among vaccinated persons
  - Also called **vaccine effectiveness** or **relative risk reduction**
- $1 - RR$



1

Moderna vaccine clinical trial

- Vaccine efficacy of 94.1%
- Trail data:
- 30,420 participants
  - 15,210 in treatment group
  - 15,210 in placebo group
- 196 participants with symptomatic COVID-19
  - 11 in treatment group
  - 185 in placebo group

$$\widehat{RR} = \frac{\hat{p}_1}{\hat{p}_2} = \frac{11/15210}{185/15210} = 0.059$$

$$1 - \widehat{RR} = 0.941$$

2

J&J vaccine clinical trial

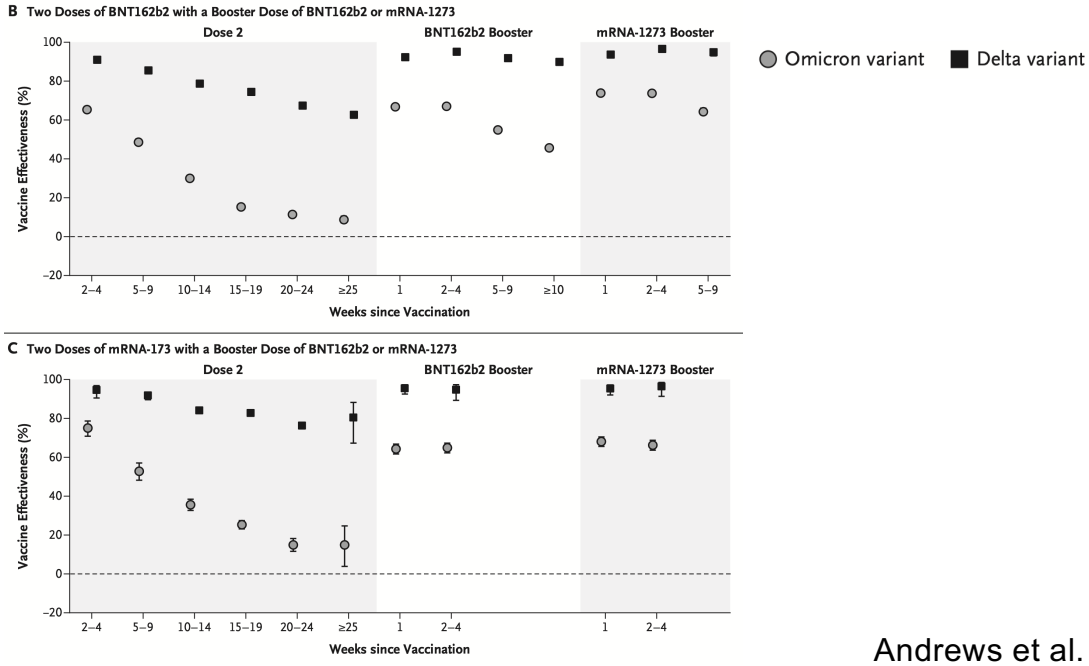
- Vaccine efficacy of 94.1%
- Trail data:
- 39,321 participants
  - 19,691 in treatment group
  - 19,630 in placebo group
- 464 participants with symptomatic COVID-19
  - 116 in treatment group
  - 348 in placebo group

$$\widehat{RR} = \frac{\hat{p}_1}{\hat{p}_2} = \frac{116/19691}{348/19630} = 0.332$$

$$1 - \widehat{RR} = 0.668$$

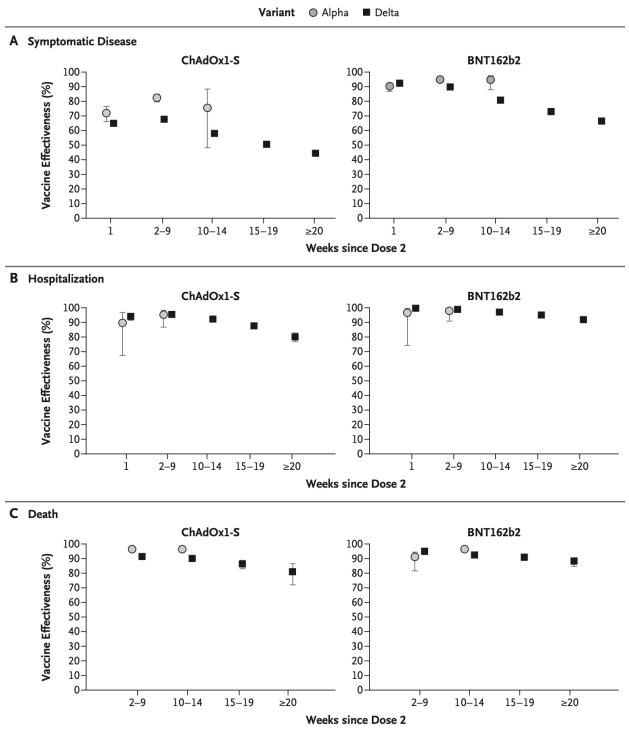
3

More recent data…



Andrews et al. 2022a. *NEJM*

4



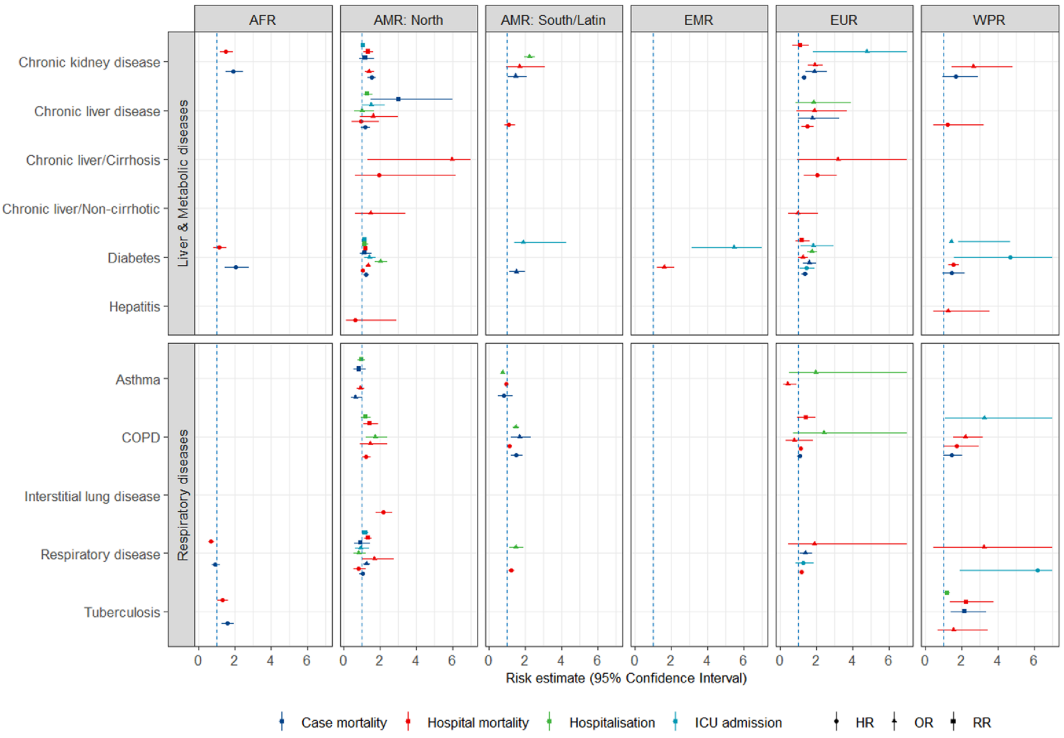
More recent data…

Andrews et al. 2022b. *NEJM*

5

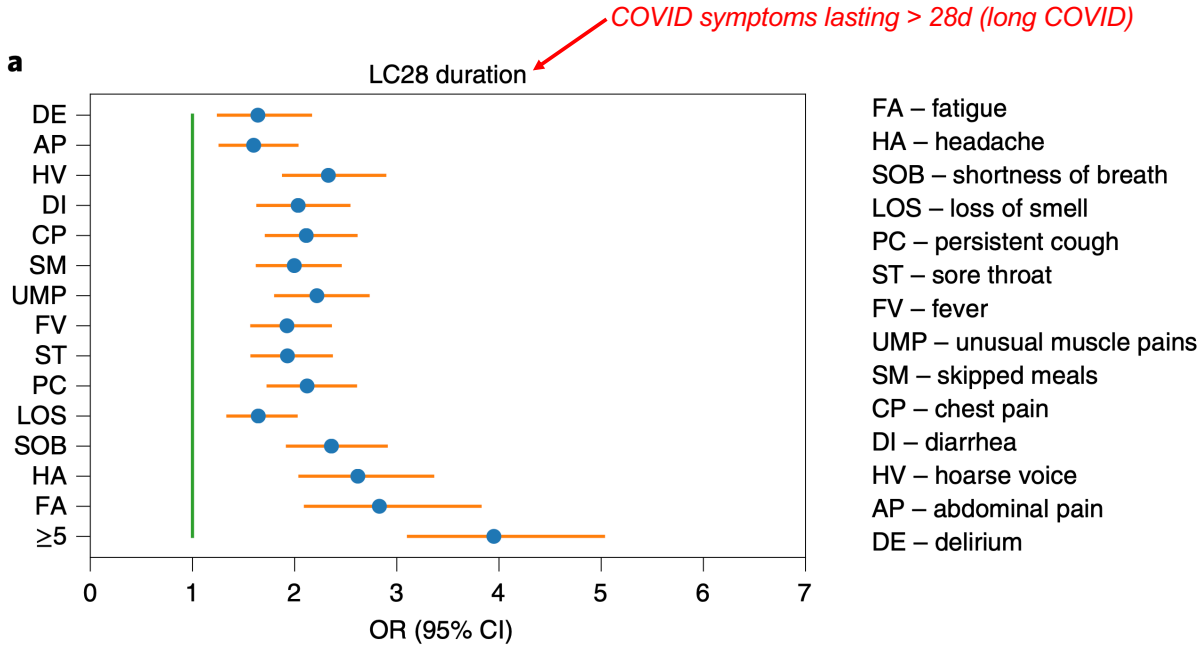
Lots of COVID studies estimate RR or OR for different risk factors for infection, hospitalization, ICU admittance, mortality, etc.

6



Treskova-Schwarzbach et al. 2021. *BMC Medicine*

7



Sudre et al. 2021. *Nature Medicine*

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