UK Health Security Agency

COVID-19 vaccine surveillance report

Week 51

Find the link to report 51 here: -

https://www.gov.uk/government/publications/covid-19-vaccine-weekly-surveillance-reports

Vaccine effectiveness against the Omicron variant

A test-negative case control design was used to estimate vaccine effectiveness against symptomatic COVID-19 with the Omicron variant compared to the Delta variant. Here, vaccination rates in PCR-positive cases are compared to vaccination rates in those who test negative. Individuals who reported symptoms and were tested in pillar 2 (community testing) between 27 November and 17 December 2021 were included in the analysis. Those who reported recent foreign travel were excluded from the analysis due to differences in exposure risk and possible misclassification of vaccination status in this group.

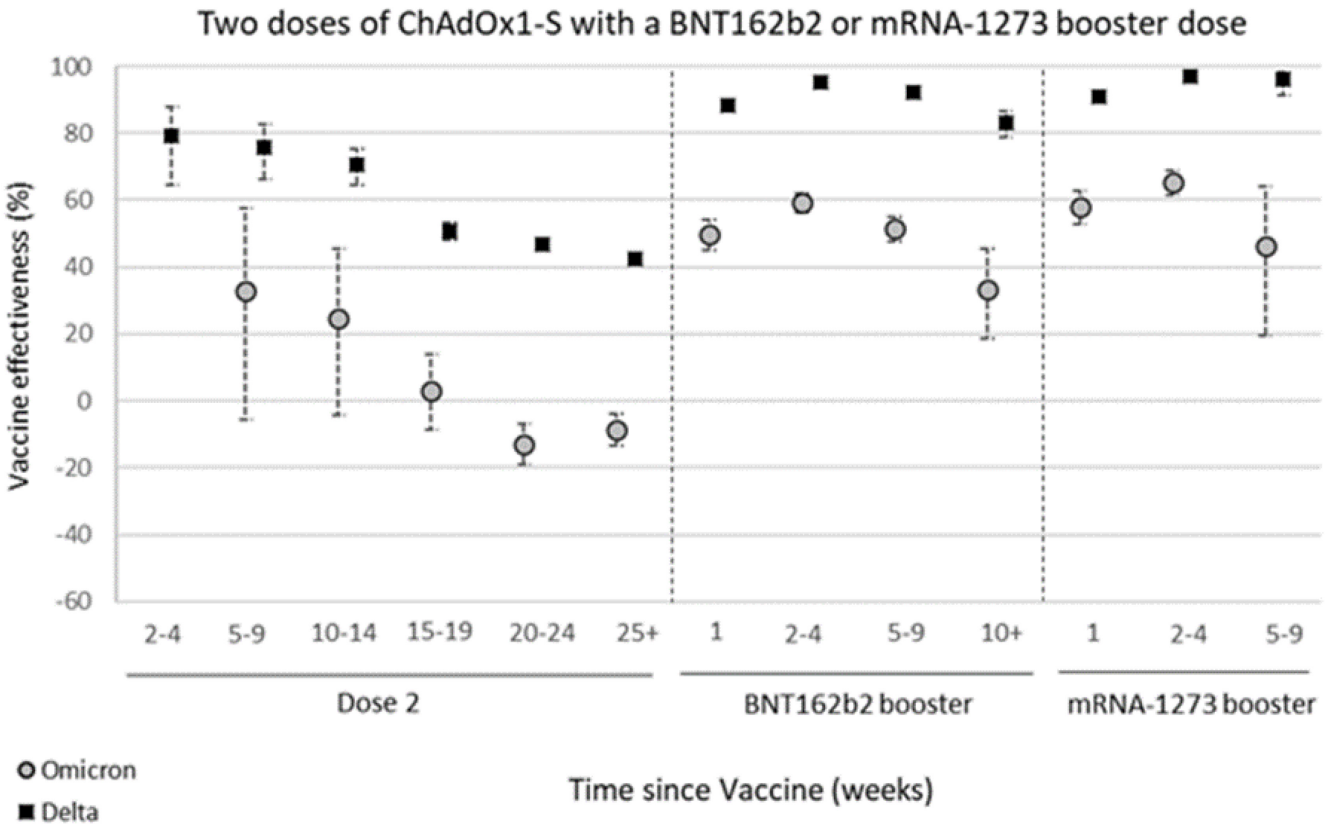
Cases were defined as the Omicron variant or Delta variant based on whole genome sequencing, genotyping or S-gene target status on PCR testing. The Omicron variant has been associated with a negative S-gene target result on PCR testing with the Taqpath assay whereas with the Delta variant the S-gene target is almost always positive. A priori, we considered that S-gene target failure would be used to define the Omicron variant when Omicron accounts for at least 80% of S-gene target failure cases. This meant that S-gene target status could be used from 27 November onwards.

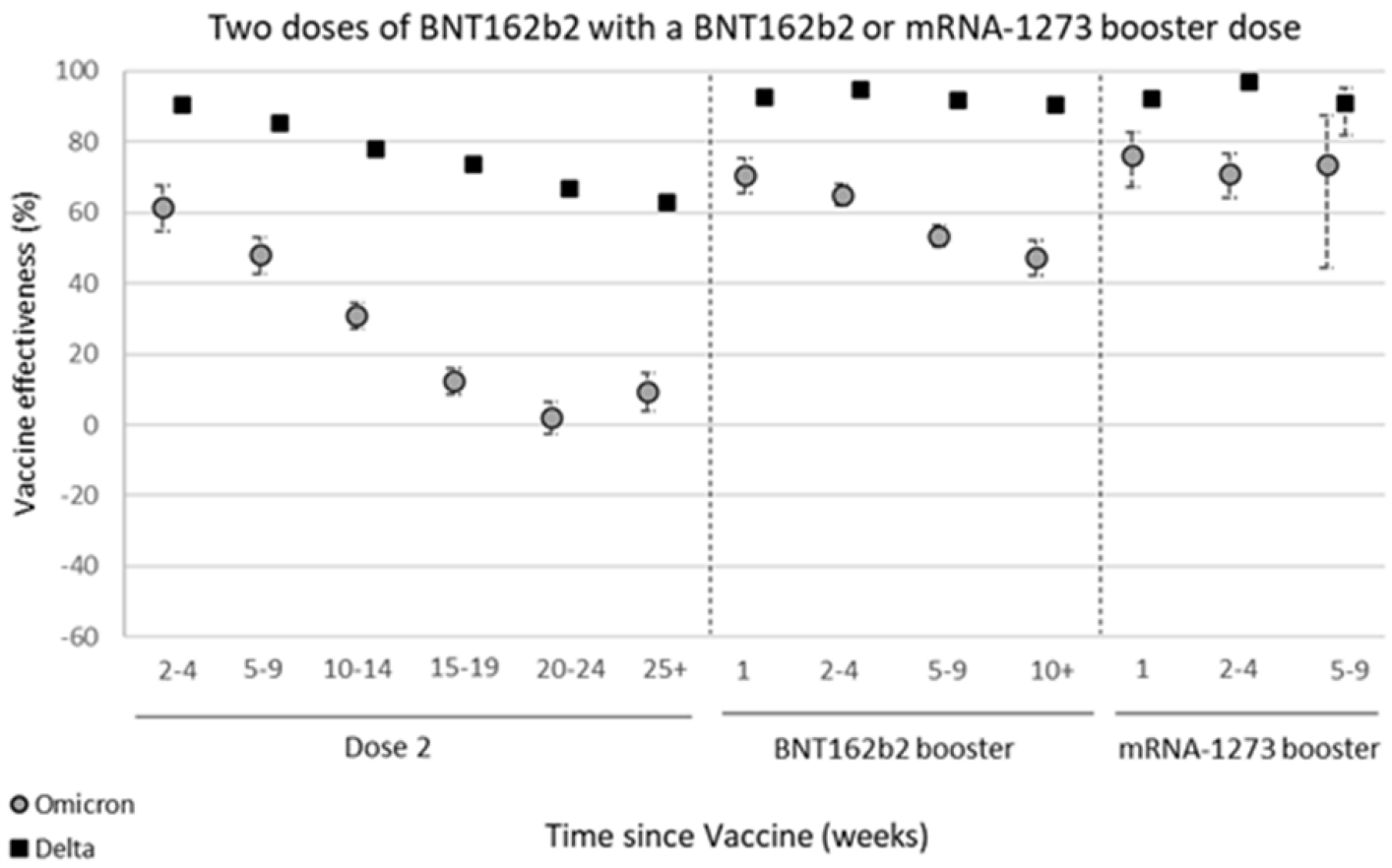
Vaccine effectiveness was estimated by period after dose 2 and dose 3.

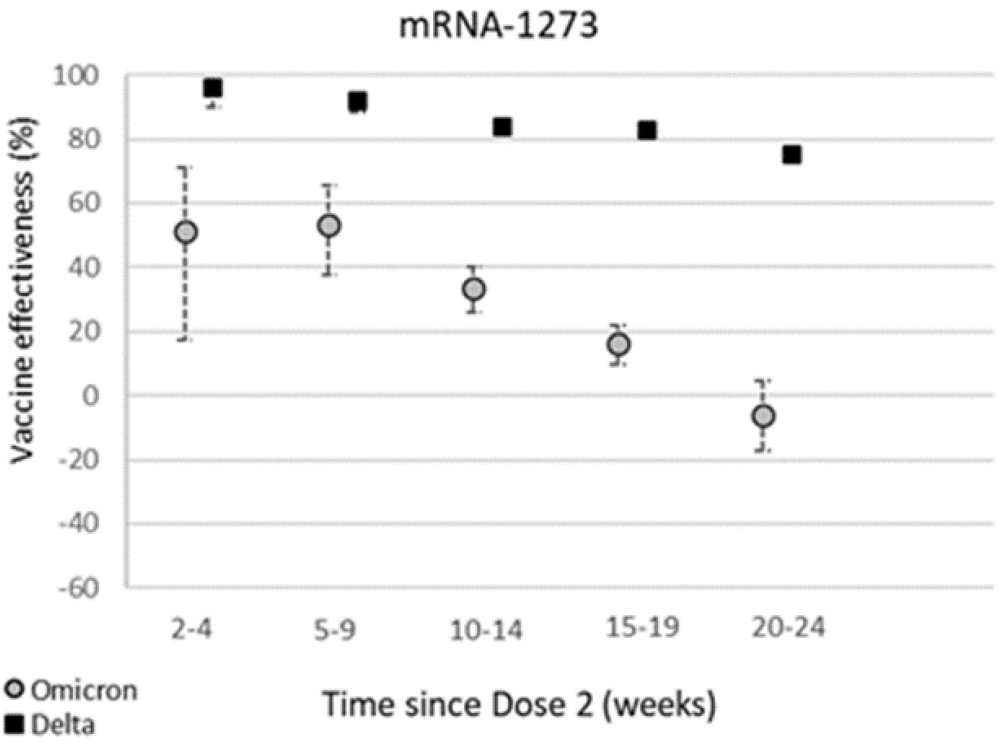
The final analysis included 147,597 Delta and 68,489 Omicron cases. Vaccine effectiveness against symptomatic disease by period after dose 2 and dose 3 is shown in Figure 6 for those who received a primary course of the AstraZeneca vaccine (Figure 6A), Pfizer (Figure 6B) or Moderna (Figure 6C). Booster estimates are separated for Pfizer and Moderna boosters. In all periods, effectiveness was lower for Omicron compared to Delta. Among those who received an AstraZeneca primary course, vaccine effectiveness was around 60% 2 to 4 weeks after either a Pfizer or Moderna booster, then dropped to 35% with a Pfizer booster and 45% with a Moderna booster by 10 weeks after the booster. Among those who received a Pfizer primary course, vaccine effectiveness was around 70% after a Pfizer booster, dropping to 45% after 10+ weeks; and stayed around 70 to 75% after a Moderna booster up to 9 weeks after booster.

Figure 6: Vaccine effectiveness against symptomatic diseases by period after dose 1 and dose 2 for Delta (black squares) and Omicron (grey circles) for (A) recipients of 2 doses of AstraZeneca (ChAdOx1) vaccine as the primary course and (B) recipients of 2 doses of Pfizer (BNT162b2) vaccine as the primary course (C) recipients of 2 doses of Moderna (mRNA-1273) vaccine as the primary course

Supplementary data are not available for this figure.




Two doses of BNT162b2 with a BNT162b2 or mRNA-1273 booster dose
Vaccine effectiveness (%)
100
80
60
40
20
0
-20
-40
-60
2-4
5-9
10-14
15-19
20-24
25+
1
2-4
5-9
10+
1
2-4
5-9
Dose 2
BNT162b2 booster
mRNA-1273 booster
Omicron
Delta
Time since Vaccine (weeks)



*Numbers were too low to estimate booster vaccine effectiveness amongst recipients of a primary course of the Moderna vaccine.

These results should be interpreted with caution due to the low counts and the possible biases related to the populations with highest exposure to Omicron (including travellers and their close contacts) which cannot fully be accounted for.

With previous variants, vaccine effectiveness against severe disease, including hospitalisation and death, has been significantly higher than effectiveness against mild disease (i.e. those detected through community testing and included here). Although an analysis has been trialled, the number of cases in hospital is too small to determine effectiveness against severe disease. It will be a few weeks before effectiveness against severe disease with Omicron can be estimated, however based on experience with previous variants, this is likely to be substantially higher than the estimates against symptomatic disease. After the emergence of Delta in the UK, early estimates of vaccine effectiveness against mild infection after two doses of vaccine were substantially attenuated in comparison to alpha. Analysis of protection against hospitalisation however, showed no diminution of protection when comparing the two variants.