

## COVID-19 vaccine given to children with comorbidities in England, December 2020–June 2021

Children have been relatively spared by SARS-CoV-2 compared with adults. Most children remain asymptomatic or develop mild, transient illness. Severe COVID-19 requiring hospitalisation is rare in children,<sup>1</sup> and fatalities are even rarer.<sup>2</sup> During the first pandemic wave, children with severe neurodisabilities were identified as having the highest risk of severe and fatal COVID-19.<sup>3</sup> Consequently, the UK Joint Committee on Vaccination and Immunisation recommended COVID-19 vaccination for children aged  $\geq 12$  years with severe neurodisabilities who were more likely to be at higher risk of recurrent respiratory infections and spend time in specialised residential care settings for complex needs (<https://www.gov.uk/government/publications/covid-19-the-green-book-chapter-14a>). This recommendation was made in December 2020 at the same time as recommendations for adults with underlying comorbidities, even though COVID-19 vaccines were not authorised for individuals aged 12–15 years at the time, because the benefits of vaccination were assessed to outweigh potential harms.

To assess how well these recommendations were implemented in children, we analysed COVID-19 vaccination data from the National Immunisation Management System (NIMS) in children aged  $< 16$  years during December 2020–June 2021. NIMS is a near-real time online database of individual-level COVID-19 vaccination records in England. We sent questionnaires to general practitioners of 748 children recorded to have been vaccinated in NIMS to confirm their vaccination status, date and brand of vaccine, reason for vaccination, medical attendance post-vaccination and previous SARS-CoV-2 infection status; 598 (80%) returned the questionnaire, and 533 children were confirmed as receiving  $\geq 1$  COVID-19 vaccine dose. The median age of vaccinated children was 15 years, with 79 (15%) aged  $\leq 12$  years. Most had received Pfizer-BioNTech (402/533, 75%), followed by AstraZeneca (122/533, 23%) and Moderna (7/533, 1%), with 60% (319/533) receiving two doses (245 [61%] Pfizer-BioNTech, 74 [61%] AstraZeneca);

**Table 1** Children vaccinated against COVID-19 in England, December 2020–June 2021

Age distribution of children (years)	n	%
0–5	6	1.1
6–11	22	4.1
12	51	9.6
13	75	14.1
14	104	19.5
15	275	51.6
<b>Total</b>	<b>533</b>	<b>100.0</b>
<b>Reason for vaccination according to GP</b>		
<b>Eligible for vaccination</b>	<b>n</b>	<b>%</b>
Severe neurodisability	151	28.3
Complex congenital syndromes	50	9.4
Learning difficulties	48	9.0
<b>Likely to be eligible for vaccination</b>		
Down syndrome (Trisomy 21)	29	5.4
Vulnerable condition not recorded	16	3.0
<b>Immunosuppression and contacts</b>		
Contact of a vulnerable person in the household	31	5.8
Immunosuppressed	23	4.3
<b>Other medical conditions</b>		
Chronic respiratory disease	51	9.6
Epilepsy	17	3.2
Chronic heart disease	15	2.8
Metabolic condition	13	2.4
Chronic gastrointestinal disease	5	0.9
Haematological condition	4	0.8
Chronic renal disease	2	0.4
Other	1	0.2
<b>Inappropriate vaccination</b>		
Vaccinated without clinical indication	72	13.6
Left over vaccine after clinic	3	0.6
<b>Taking part in a vaccine trial</b>	<b>1</b>	<b>0.2</b>
<b>Total</b>	<b>533</b>	<b>100.0</b>

four received mixed doses (AstraZeneca then Pfizer-BioNTech). Only 2% (11/533) had medically attended side-effects post-first dose, predominantly headaches and fever/fatigue/flu-like symptoms (7/533, 1%), with a similar proportion post-second dose (8/533, 2%), mainly fever (6/8, 75%).

Only 47% (249/533) were appropriately vaccinated according to national recommendations, although 45 (8%) others, including 29 children with Down syndrome, likely also fulfilled the recommendation criteria (table 1). Such small numbers of vaccinated children, however, indicate that a large number of very high-risk children (eg, there are  $\sim 15\,000$  children aged 12–15 years with life-limiting conditions in England) have remained unprotected for  $> 9$  months.<sup>4</sup> Possible reasons include clinicians being cautious about prescribing an unauthorised vaccine or, alternatively, there may have been operational difficulties in arranging vaccination for children with appropriately

trained staff at COVID-19 vaccine centres set up primarily for adult vaccination. Parents may also have been concerned about unauthorised vaccine use for their children.

Ten per cent (54/533) of children were vaccinated because they were immunosuppressed or they were household contacts of a vulnerable individual, although this recommendation was not made until 19 July 2021, while 20% (108/533) had comorbidities that were not eligible for vaccination (table 1). Presumably, clinicians considered the benefits of vaccination to outweigh potential risks for these children.

On 13 September 2021, the UK announced COVID-19 vaccination for all individuals aged 12–15 years. However, a multidisciplinary approach, including flexible vaccination services with appropriately trained staff, will be critical for ensuring high vaccine uptake in children with complex needs.

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