Archived Editions (COVID-19 Genomics and Precision Public Health Weekly Update)

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COVID-19 Genomics and Precision Public Health Weekly Update Content

Pathogen and Human Genomics Studies

- Effectiveness of 2-Dose BNT162b2 (Pfizer BioNTech) mRNA Vaccine in Preventing SARS-CoV-2 Infection Among Children Aged 5–11 Years and Adolescents Aged 12–15 Years — PROTECT Cohort, July 2021–February 2022 (https://www.cdc.gov/mmwr/volumes/71/wr/mm7111e1.htm?s_cid=mm7111e1_w)
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  > Receipt of 2 doses of Pfizer-BioNTech COVID-19 vaccine has been shown to be effective in preventing infection with the SARS-CoV-2 B.1.617.2 (Delta) variant in persons aged =12 years.Children and adolescents aged 5–15 years were tested for SARS-CoV-2 weekly, irrespective of symptoms, during July 2021–February 2022. Approximately one half of Omicron infections in unvaccinated children and adolescents were asymptomatic. Two doses of Pfizer-BioNTech COVID-19 vaccine reduced the risk of Omicron infection by 31% among children aged 5–11 years and by 59% among persons aged 12–15 years.

- Lower Risk of Paediatric Inflammatory Multisystem Syndrome (PIMS-TS) with the Delta variant of SARS-CoV-2 (https://www.medrxiv.org/content/10.1101/2022.03.13.22272267v1)
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  > Early estimates suggested a risk of PIMS-TS of 1 in 3-4000 infected children. Whether this risk is sustained with new SARS-CoV-2 variants remains unknown. We utilised prospective data from the NHS South Thames Paediatric Network (STPN), which manages all cases of PIMS-TS amongst 1.5 million children in South-East England, to assess trends over time. Compared with the Alpha wave, we found fewer cases of PIMS-TS relative to SARS-CoV-2 infections during both initial and subsequent

Delta waves. This relative reduction continued into the Omicron wave. Re-infection rates with the Alpha or Delta variants and vaccination rates were very low during the Delta wave.

- Hospitalization of Infants and Children Aged 0–4 Years with Laboratory-Confirmed COVID-19 — COVID-NET, 14 States, March 2020–February 2022
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  KJ Marks et al, MMWR, March 15, 2022

  COVID-19 can cause severe illness in infants and children, including those aged 0–4 years who are not yet eligible for COVID-19 vaccination. During Omicron variant predominance beginning in late December 2021, U.S. infants and children aged 0–4 years were hospitalized at approximately five times the rate of the previous peak during Delta variant predominance. Infants aged <6 months had the highest rates of hospitalization, but indicators of severity (e.g., respiratory support) did not differ by age group.

- Increased risk of SARS-CoV-2 reinfection associated with emergence of Omicron in South Africa
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  Here, we provide two methods for monitoring reinfection trends in routine surveillance data to identify signatures of changes in reinfection risk and apply these approaches to data from South Africa's SARS-CoV-2 epidemic to date. While we found no evidence of increased reinfection risk associated with circulation of Beta (B.1.351) or Delta (B.1.617.2) variants, we find clear, population-level evidence to suggest immune evasion by the Omicron (B.1.1.529) variant in previously infected individuals in South Africa.

- Efficacy of a Fourth Dose of Covid-19 mRNA Vaccine against Omicron
  (https://www.nejm.org/doi/full/10.1056/NEJMc2202542)
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  Our data provide evidence that a fourth dose of mRNA vaccine is immunogenic, safe, and somewhat efficacious (primarily against symptomatic disease). A comparison of the initial response to the fourth dose with the peak response to a third dose did not show substantial differences in humoral response or in levels of omicron-specific neutralizing antibodies. Along with previous data showing the superiority of a third dose to a second dose,4 our results suggest that maximal immunogenicity of mRNA vaccines is achieved after three doses and that antibody levels can be restored by a fourth dose.

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Non-Genomics Precision Health Studies

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News, Reviews and Commentaries

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