

High prevalence of antibodies against COVID-19 within the general population: Evidence from Nairobi and Kilifi



Key messages:

- By May 2022, **69% of individuals residing within the Kilifi Health and Demographic System (HDSS) and 91% residing within the Nairobi Urban HDSS** had evidence of an immune response to COVID-19 resulting from natural infection and/or vaccination, i.e., anti-spike IgG antibodies.
- The majority of HDSS residents with anti-spike IgG antibodies appear to have developed them as a result of natural infection, as only 11% - 27% of study participants reported receiving one or more doses of COVID-19 vaccine by May 2022.
- The proportion of HDSS residents with anti-spike IgG antibodies was significantly higher in Nairobi, an urban setting, than in rural Kilifi.
- Seroprevalence by May 2022 represents a substantial increase from May 2021 when about 20% of the residents within the Kilifi HDSS and 40% within the Nairobi Urban HDSS had anti-spike IgG antibodies.
- Surveillance for COVID-19 antibodies among residents of HDSS sites provides an opportunity to understand the extent COVID-19 spread and immunity within the general population in Kenya.

- These findings suggest:
 - Substantial spread of SARS-CoV-2 (the virus causing COVID-19) within the general population over time.
 - High population immunity predominantly derived from natural infection. However, the extent and duration of protection afforded against new COVID-19 variants is still not fully understood.
 - A need to prioritize COVID-19 vaccination among the elderly and other vulnerable populations living in rural areas, as population immunity appears lower in rural settings compared to urban settings.
- These are preliminary estimates, shared rapidly to inform policy and research in a timely manner. Analyses to adjust the estimates for test performance are ongoing and may slightly change seroprevalence estimates. In addition, testing of samples from the Nairobi Urban HDSS is still ongoing.
- In the context of emerging evidence on the level of immunity afforded by either natural infection, vaccination, or both natural infection and vaccination (hybrid immunity), these findings can help inform COVID-19 control policies in Kenya, including vaccination policy. These findings can also inform models predicting the risk of severe COVID-19 morbidity in Kenya for future circulating COVID variants.

Introduction

In collaboration with the Ministry of Health and other partners, the KEMRI-Wellcome Trust Research Programme (KWTRP) continues to conduct surveillance on levels of antibodies against COVID-19 among various populations. The presence of antibodies to the spike protein of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) indicates a history of either COVID-19 vaccination or natural SARS-CoV-2 infection.

Since February 2022, KWTRP and the African Population and Health Research Center (APHRC) have conducted surveillance for COVID-19 antibody levels among residents of the Kilifi Health and Demographic Surveillance System (HDSS) and the Nairobi Urban HDSS. This Policy Brief summarizes preliminary estimates of the proportion of the population with COVID-19 antibodies at the two sites.

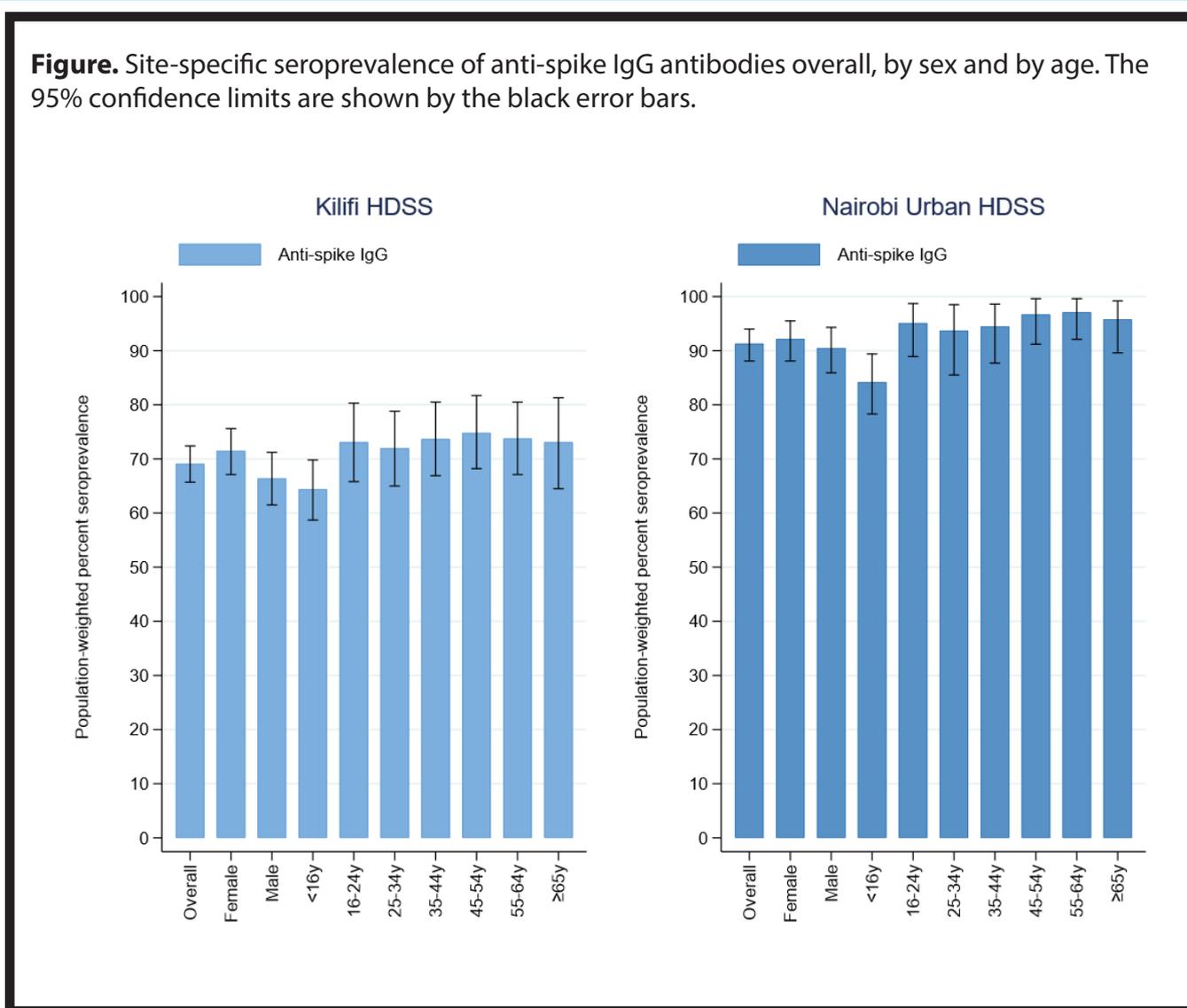
¹World Health Organization (WHO) 2022. Interim statement on hybrid immunity and increasing population seroprevalence rates. Available from: <https://www.who.int/news/item/01-06-2022-interim-statement-on-hybrid-immunity-and-increasing-population-seroprevalence-rates> (Accessed 09 June 2022).

Findings from serosurveillance for COVID-19 antibodies among residents of the Kilifi HDSS and the Nairobi Urban HDSS, February 2022 – May 2022

- The data presented are from a sample of 851 residents of the Kilifi HDSS which covers five sub-counties out of Kilifi County's eight sub-counties, and 392 residents of the Nairobi Urban HDSS, which includes Korogocho and Viwandani.
- Children and adults residing within the Kilifi HDSS were sampled between 15th February and 8th May 2022 (median sampling date 23rd March 2022) and between 8th March and 13th May 2022 (median sampling date 25th March 2022) for those residing within the Nairobi Urban HDSS.
- The prevalence of COVID-19 antibodies (seroprevalence) was adjusted to account for the age and sex distribution of the respective HDSS (i.e., population-weighted).

Seroprevalence of IgG antibodies

- The population-weighted seroprevalence of anti-spike IgG antibodies among residents of the **Kilifi HDSS** was **69.1%** (confidence limit 65.7 – 72.4%).
 - This represented a significant increase from a seroprevalence of 19.8% (confidence limit 16.8 – 23.1%) within the same population by May 2021.
 - Seroprevalence was comparable between sexes and age groups.
 - 17.1% of Kilifi HDSS residents 15 years of age or older (11.0% of the total sample) reported receiving one or more doses of COVID-19 vaccine.
- The population-weighted prevalence of anti-spike IgG antibodies among residents of the **Nairobi Urban HDSS** was **90.8%** (confidence limit 87.5 – 93.5%).
 - This represented a significant increase compared to seroprevalence within the same population by May 2021 which was 40.4% (confidence limit 36.0 – 45.0%).
 - Seroprevalence was comparable between sexes and appeared lower among children below 16 years of age compared to adults 45 years of age and older.
 - 45.8% of the participants 15 years of age or older (26.8% of the total participants sampled) reported receiving one or more doses of COVID-19 vaccine.
- The prevalence of anti-spike IgG antibodies appeared significantly higher among Nairobi Urban HDSS residents compared to Kilifi HDSS residents (Figure).



²Scott JA, Bauni E, Moisi JC, et al. Profile: The Kilifi Health and Demographic Surveillance System (KHDSS). *Int J Epidemiol.* 2012;41(3):650-657. doi:10.1093/ije/dys062

Beguy D, Elung'ata P, Mberu B, et al. Health & Demographic Surveillance System Profile: The Nairobi Urban Health and Demographic Surveillance System (NUHDSS). *Int J Epidemiol.* 2015;44(2):462-471. doi:10.1093/ije/dyu251

Acknowledgments

- KEMRI-Wellcome Trust Research Programme serosurveillance project teams, Community Liaison Group, Communications team, Operations team
- African Population and Health Research Center (APHRC) serosurveillance project team
- CDC Kenya
- KEMRI Center for Global Health Research
- Presidential Policy and Strategy Unit
- Ministry of Health

Funding: The Bill & Melinda Gates Foundation