

SAGO statement on newly released SARS-CoV-2 metagenomics data from China CDC on GISAID

On 12 March 2023, WHO was made aware of new SARS-CoV-2 sequences and metagenomics data associated with samples collected in the Huanan Seafood Wholesale Market, Wuhan, China, from January 2020, that became available on GISAID for a short period of time. The data had subsequently been downloaded by a number of researchers from several countries. Access was restricted shortly after, apparently to allow further data updates by China CDC. WHO then immediately reached out to China CDC and to the Chair and Vice-Chair of SAGO. Upon discussions between WHO and Chinese colleagues, it was explained that the genomic data are the basis for an expected update to the existing [Liu et al. 2022 preprint](#) (1), which is in the process of being re-submitted for publication to Nature by China CDC.

After discussions with the WHO secretariat and the SAGO Chair and Vice-Chair, a call was arranged on 12 March with the scientists involved from China CDC, and some of those who had accessed the data from GISAID, to gauge the significance of this data and the analyses of this data. WHO subsequently organized a meeting on 14 March 2023 with all SAGO members, and invited researchers from China CDC to present the updated analysis of their data. WHO and SAGO also invited the researchers who had informed WHO that they had accessed data from GISAID, to present their analysis of the temporarily released sequences.

The presentations from China CDC and invited international researchers indicated that there were newly available data from the Huanan Seafood Wholesale Market. This included metagenomic data of environmental samples from various stalls and wastewater collection sites collected as early as January 2020. Analyses of these data suggest that apart from SARS-CoV-2 sequences, some samples also contained human DNA, as well as mitochondrial DNA of several animal species, including some that are known to be susceptible to SARS-CoV-2. This included DNA from wild raccoon dogs, Malaysian porcupine, and bamboo rats among others, in SARS-CoV-2 positive environmental samples.

The findings suggest that animals were present at the market shortly before the market had been cleared on 1 January 2020, as part of the public health measures by Chinese authorities. These results provide potential leads to identifying intermediate hosts of SARS-CoV-2 and potential sources of human infections in the market.

According to the Chinese's authors pre-print ([Liu et al](#) 2022), of 1380, samples collected from the environment and animals within the market in early 2020, 73/923 environmental samples tested positive for SARS-CoV-2-specific RT-qPCR, from various stalls and sewerage systems in and around the market, but no virus was detected in 457 animal samples tested. The animal samples included animal bodies, frozen animal carcasses and animal products, as well as stray animals around the market, and covered 18 species. According to the preprint, raccoon dogs were not amongst the animals tested. However, the presence of high levels of raccoon dog mitochondrial DNA in the metagenomics data from environmental samples identified in the new analysis, suggest that raccoon dog and other animals may have been present before the market was

cleaned as part of the public health intervention.

Historical photographic evidence was provided that shows raccoon dogs and other animals were sold at these specific stalls in the past. Although this does not provide conclusive evidence as to the intermediate host or origins of the virus, the data provide further evidence of the presence of susceptible animals at the market that may have been a source of human infections.

SAGO will continue to evaluate any and all scientific data shared by Chinese and other researchers from anywhere in the world. SAGO encourages any and all data related to the studying of the origins of SARS-CoV-2 be made available immediately for robust and comprehensive review.

As mentioned in SAGO's [preliminary report](#) (2), the SAGO strongly recommends that researchers in China investigate the upstream sources of the animals and animal products present in Huanan market just before its closure and removal of all animal products on 1 January 2020.

Furthermore, SAGO would like to encourage any and all available sequencing and metagenomic data to be made public on GISAID, or any other sequence database, and the pre-prints that are in review to be shared as soon as possible so the scientific community has the opportunity to analyse these further. In addition, SAGO encourages researchers using this data to collaborate and engage with Chinese researchers. WHO and SAGO are happy to facilitate these collaborations.

(1) Liu et al, 2022. Surveillance of SARS-CoV-2 in the environment and animal samples of the 2 Huanan Seafood Market, Available: <https://www.researchsquare.com/article/rs-1370392/v1>

(2) Preliminary Report for the Scientific Advisory Group for the Origins of Novel Pathogens (SAGO) June 2022, Available: <https://www.who.int/publications/m/item/scientific-advisory-group-on-the-origins-of-novel-pathogens-report>