Rapidly rising cases with Omicron in Senegal

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Since the start of the pandemic, the World Health Organization (WHO) designated five variants as Variant of Concern (VOC). The Omicron variant is the fifth VOC after Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1), and Delta (B.1.617.2) [3]. This Omicron (B.1.1.529) variant detected for the first time in South Africa in November 24, 2021 [4]. Since the first confirmed case in Wuhan, China, in December 2019 [1], Senegal has experienced several waves of COVID-19 pandemic. The British variant was dominant during the second pandemic wave [2]. Its presence in Senegal was revealed by the laboratory of the Institut de Recherche en Santé, de Surveillance Épidémiologique et de Formation (IRESSEF), which performs daily phylodynamic monitoring of SARS-CoV-2 (A). Since the start of the pandemic, the World Health Organization (WHO) has aimed to sequence any positive sample collected and ensure real time surveillance of the coronavirus strains circulating in Senegal (B). With real-time sequencing, we were able to detect the first patient infected with the new coronavirus variant Omicron present with 32 mutations in the spike protein, in the regions of Dakar and Thiès, areas where the variant was first detected. Samples were also collected from contacts of patients for sequencing using Oxford nanopore platform and ARTIC protocol. FASTQ files were analyzed using ARTIC bioinformatic pipeline. Pangolin (version) was used to determine the lineage for each sample. Mutations analysis was done and confirmed using CoVsurver in GISAID. All consensus genomes were deposited in GISAID.

IRESSEF detected the first positive case of the Omicron variant on Friday, December 3, 2021, in an outgoing traveler. The RT-PCR test using nasopharyngeal swab was positive for the SARS-COV-2 virus with a cycle threshold (CT) of 27. The patient was a 58-year-old male French visiting Senegal. He arrived on Monday, November 22, 2021 by a flight from a country in the sub-region. He received his first vaccination dose on April 13, 2021 with AstraZeneca and the second one on June 25th with Pfizer. He stayed in Dakar in a local hotel and participated in an event attended by nearly three hundred people of different nationalities. The event took place from November 24 to 25, 2021. He was quarantined and followed in a local health center. As of December 4, 2021, the infected patient was still asymptomatic.

On December 3, 2021, out of 24 sequenced samples, we characterized 21 new variants of concern, including 20 Delta B.1.617.2 and 1 Omicron B.1.1.529. The case was notified to the Directorate General of Health on Friday, December 3, 2021. The surveillance division of the Direction of Prevention proceeded with the investigation of the case on Saturday, December 4, 2021. The second notification was done on December 19, 2021 when 16 new variants of concern were detected, of which 11 samples were positive for the Omicron variant and 5 for the Delta variant. The third notification on December 25, 2021, out of 24 samples sequenced we obtained 22 variants of concern including: 20 Omicron variants and 2 Delta variants.

We aimed to sequence any positive sample collected and strengthen its surveillance system following the notification by the WHO of the Omicron variant. Our results show clearly
shows rapid progression of the Omicron variant and this new variant has become clearly predominant in new infections of SARS-CoV-2 (C).

In this very particular context of the emergence of SARS-CoV-2 variants, daily surveillance is carried out to prevent the risk of the virus spreading in an African context where vaccination coverage is not optimal to protect the population. Close collaboration exists between the authorities in charge of health and the Institut de Recherche en Santé, de Surveillance Epidémio-logique et de Formations for phylodynamic surveillance (A), to prevent the spread of new variants which is a source of concern and panic for countries as well as the world.

**Conflict of interest**

The authors have declared that no competing interests exist.

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**Ethical approval**

This study was approved by the National Ethics Committee for Health Research of Senegal under the following number: 000159/MSAS/CNERS/Sec, on August 21st, 2020. Free and informed consent is provided by each adult individual who participated in this study.

**Author contributions**

AP, KG, SM conceived and designed the study. SN, NL, SEN, DD and CD performed the experiments. AP, NL, CD, SN, KG, and DD recruited study participants and collected data. AP and KG analyzed and interpreted the data. SM,
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