

## Research

**Impact of COVID19 on routine immunization: A cross-sectional study in Senegal**

**Amadou Sow<sup>\*</sup>, Modou Gueye, Djibril Boiro, Idrissa Demba Ba, Abou Ba, Aliou Thiongane, Papa Moctar Faye, Amadou Lamine Fall, Ousmane Ndiaye**

<sup>\*</sup> Chair of Pediatrics, Cheikh Anta Diop University of Dakar, Fann, Senegal

**Abstract**

The COVID 19 pandemic has prompted the world to implement drastic prevention methods based on limiting population movements that have an impact on public health policies such as vaccination. The objective of this work was to evaluate the impact of these prevention measures on routine vaccination in hospitals since the advent of the pandemic in Senegal.

**Methodology:** This is a retrospective cross-sectional study carried out in August 2020 in the vaccination unit of the Abass NDAO hospital centre. We compared data from the vaccination unit during the period from March to August of the last three years (2018, 2019 and 2020). The parameter studied was the number of vaccine doses administered for the different periods according to the expanded programme of immunization.

**Results:** For the vaccines administered in the sixth week in April, the number of doses was 36 in 2018, 29 in 2019 and 15 in 2020, i.e. a 50% drop compared to March. In July the number of doses administered was 40 in 2018, 35 in 2019 and 15 in 2020, a reduction of 42% compared to 2019.

**Conclusion:** Measures to fight this pandemic should not make us forget routine vaccination, especially in our resource-constrained countries. It is essential to continue vaccination for children and to identify children who have missed vaccine doses for catch-up.

**Keywords:** COVID19, Vaccination, Impact, Children, Senegal

**Introduction**

COVID 19 was identified in January 2020 as the cause of a pneumonia epidemic in China [1]. It was declared a pandemic by the World Health Organization (WHO) due to the high contagion rate [2]. As of August 28, 2020, COVID-19 has caused the death of 833,135 (3.40%) people worldwide and infected 24 532 835 [3]. This pandemic has prompted the world to implement drastic prevention methods based on barrier measures, isolation, quarantine and restriction of population movements [1]. These measures had a considerable negative impact on the economy and on public health policies such as vaccination [4]. In Senegal, the Expanded Programme on Immunization or EPI (Table 1) was launched in 1974 with vaccination coverage that has led to the eradication of several childhood diseases and a reduction in mortality among children under 5 years of age [5]. The objective of this work was to evaluate the impact of the COVID-19 and preventive measures on routine hospital immunization since the advent of this pandemic in the country on 2 March 2020.

**Methodology**

This is a retrospective cross-sectional study carried out during the month of August 2020 in the vaccination unit of the ABASS NDAO hospital center (CHAN) in Dakar, which is a level III public hospital. The vaccination unit is very busy because CHAN is home to one of the largest mother-child center in the country with a maternity unit that receives an average of 5,000 parturients per year. All newborns born in the facility are directly referred to the vaccination unit and are followed according to the vaccination calendar until the age of 15 months.

**Corresponding Author:** Amadou SOW, Pediatrician, Cheikh Anta Diop University of Dakar, Senegal

**Received date:** October 07, 2020; **Accepted date:** October 15, 2020; **Published date:** October 16, 2020.

**DOI:** <https://doi.org/10.31546/JPCI.1001>

The unit also receives children born outside the facility. We compared the data from the vaccination unit for the period March to August for the last three years (2018, 2019 and 2020). The parameter studied was the number of vaccine doses administered for the different periods according to the EPI: at birth (BCG, poliomyelitis), at 6 weeks then at 10 weeks (pentavalent, pneumococcal, rotavirus and polio vaccine), at 14 weeks and at 9 months (measles, rubella and yellow fever). The data were collected from the vaccination register and collected on a pre-established survey form. Data analysis was done with version 9.4 of the SAS software.

**Table 1:** Calendar of the Expanded Program on Immunization (EPI) in Senegal

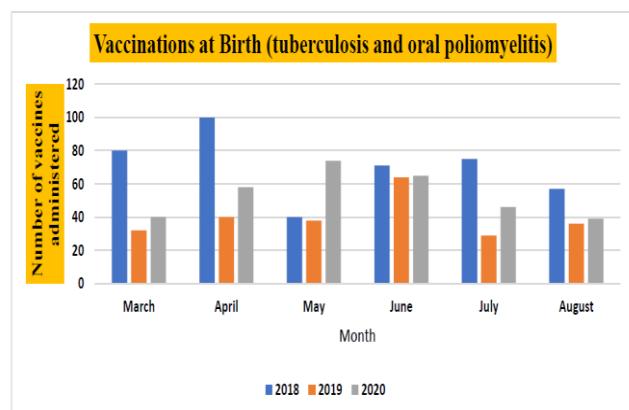
BCG = Bacillus Calmet Guérin, OPV = oral polio vaccine, IPV = injectable polio vaccine, YF = yellow fever, MR = measles-rubella, Pentavalent=Diphtheria + Tetanus + Whooping cough + Hepatitis B + Hib infections

Ages	Vaccines	Target diseases
At birth	Hepatitis B, BCG, OPV	Hepatitis B, tuberculosis, Poliomyelitis
Sixth week (first dose)	OPV , Pentavalent , Rotavirus Anti-pneumococcal	Diphtheria Tetanus Whooping cough Hepatitis B Hemophilus B (Hib) infections Poliomyelitis Pneumococcal infections Rotavirus infections
Tenth week (second dose)	OPV Pentavalent Rotavirus Anti-pneumococcal	
Fourteenth week (third dose)	IPV Pentavalent Anti-pneumococcal	
Ninth month	MR YF	Measles - Rubella Yellow fever
15 months	MR	Measles - Rubella

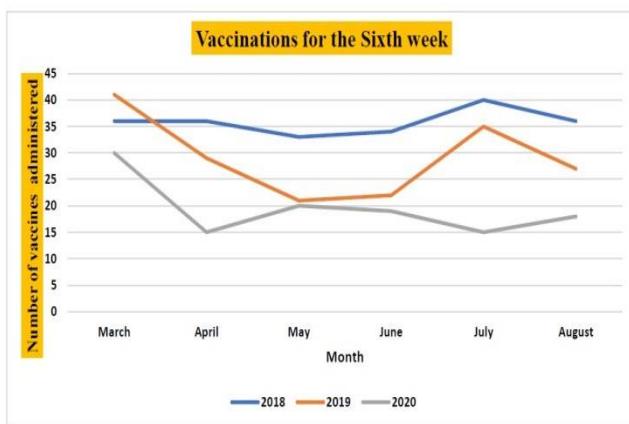
## Results

For vaccines administered at birth (tuberculosis, oral polio), the number of doses administered at the vaccination unit level was 80 for March 2018, 32 for March 2019 and 40 for March 2020. The same trends are observed when comparing the months of April, May, June, July and August of the year 2020 with the last two years (2018, 2019). The number of doses administered for birth vaccines by month and year is shown in Figure 1. For vaccines administered at week 6 according to the EPI, there are 36 doses administered in March 2018, 41 doses in 2019 and 30 doses in 2020.

In April, the number of doses was 36 in 2018, 29 in 2019 and 15 in 2020, a decrease of 50% compared to March. In July the number of doses administered was 40 in 2018, 35 in 2019 and 15 in 2020, a reduction of 37% compared to 2018 and 42% compared to 2019. The numbers of doses administered for the sixth, tenth and fourteenth week vaccines are shown in Figures 2, 3 & 4. For yellow fever, measles and rubella vaccines administered at month 9, the number of doses administered was 10 in 2018, 24 in 2019 and 20 in 2020. In April, the number of doses administered in 2020 fell to 5 compared to 5 in 2020, a drop of 20.8% compared to March. The numbers of doses administered for the ninth month vaccines by month and year are shown in Figure 5.



**Figure 1:** Number of doses administered for vaccines at birth against tuberculosis (BCG) and oral poliomyelitis according to the month from 2018 to 2020



**Figure 2:** Number of doses administered for the vaccines of the sixth week according to the month from 2018 to 2020.

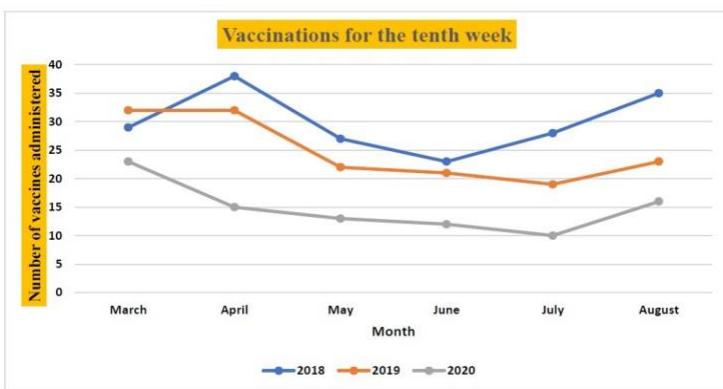


Figure 3: Number of doses administered for the tenth week vaccines according to the month from 2018 to 2020.

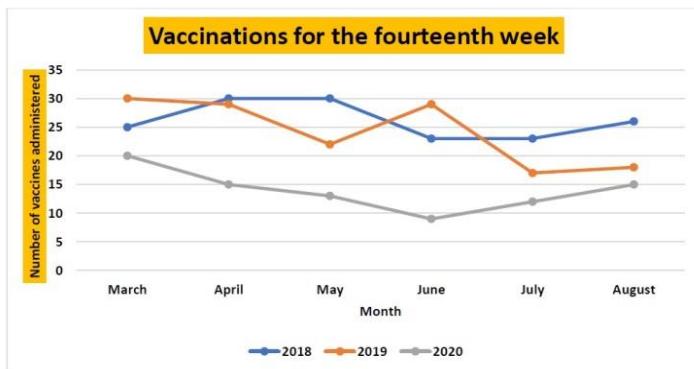


Figure 4: Number of doses administered for the 14th week vaccines according to the month from 2018 to 2020.

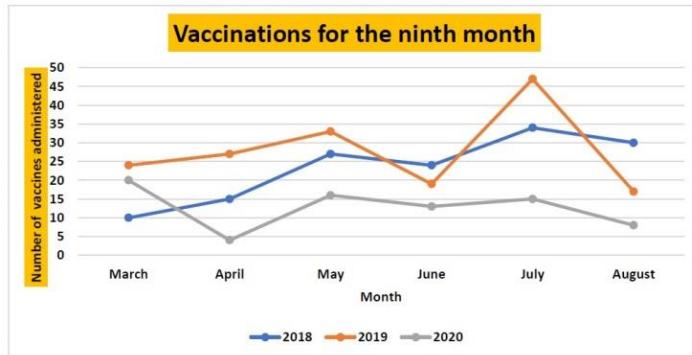


Figure 5: Number of doses administered for the ninth month vaccines according to the month from 2018 to 2020.

## Discussion

In Senegal, the first case of COVID 19 was declared on 2 March 2020 and a few weeks after the state of emergency was declared in the country, limiting the mobility of the population. The number of doses administered for tuberculosis and polio vaccines at birth in March 2020 was not impacted by VIDC 19. This could be explained by the fact that the pandemic had no impact on births during this period and that isolation measures were still limited at the individual level.

There was a marked decrease in the number of doses administered for the sixth, tenth and fourteenth week vaccines during the period April to August 2020. Similar results were observed in developed countries. 6,7,8] This period corresponds to a steady increase in the number of cases reached and coincides with the implementation of physical distancing measures such as curfews, closure of steps and places of worship, and reduction in the number of passengers on public transport [9]. This impact could also be explained by the fact that the message about staying at home initially overwhelmed the message that the vaccination programme should continue to function as usual and also led to disruptions at the vaccination units. The disruption of immunization services could trigger secondary outbreaks of vaccine-preventable diseases and also exacerbate the longstanding inequality in immunization coverage, especially in urban areas [10].

## Conclusion

COVID 19 has certainly impacted the routine vaccination of children. Measures to combat this pandemic should not make us forget routine vaccination, especially in our resource-limited countries. It is essential to continue these vaccination programmes for children under 5 years of age and to identify children who have missed vaccine doses for catch-up. This could prevent the reappearance of new epidemics such as measles, which could be associated with high morbidity and mortality.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Authors contributions:

- Amadou Sow, Modou Gueye, Djibril Boiro: Design, data collection and writing.
- Idrissa Demba Ba, Abou Ba, Aliou Thiongane, Papa Moctar Faye: Reading, correction.
- Amadou Lamine Fall, Assane Sylla, Ousmane Ndiaye: Validation.

## Acknowledgements

We would like to thank the staff of the vaccination unit, in particular Mrs. Fall Awa Touré and the management of the ABASS NDAO hospital center in Dakar.

**Consent for Publication:** Written informed consent was obtained from the patient for the publication of this case report.

**References:**

1. Giuseppe Pascarella, Alessandro Strumia, Chiara Piliego, et al. COVID-19 diagnosis and management: a comprehensive Review. *J Intern Med.* 2020;288:192-206.
2. Mahase E. Covid-19: WHO declares pandemic because of "alarming levels" of spread, severity, and inaction. *BMJ.* 2020;368:m1036.
3. WHO Visualizer. COVID 19.
4. Francesco Di Gennaro, Damiano Pizzol, Claudia Marotta, et al. Coronavirus Diseases (COVID-19) Current Status and Future Perspectives: A Narrative Review. *Int J Environ Res Public Health.* 2020;17:2690.
5. National Agency of Statistics and Demography (ANSD), and ICF. Continuous Demographic and Health Survey (EDS-Continuous 2018). Senegal: ANSD and ICF. 2020;454.
6. The Times of Israel. Vaccinations drop amid fears of VIDOC-19, raising the spectre of a new measles epidemic. *Times of Israel.* 24 April 2020.
7. Hart C. Confessions of a consultant in paediatric practice management. The Effect of COVID-19 on vaccination rates. April 6, 2020.
8. Santoli JM, Lindley MC, DeSilva MB, et al. Effects of the COVID-19 pandemic on vaccine ordering and administration Routine paediatrics - United States, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69:591-593.
9. Ministry of Health and Social Action. Covid-19 pandemic in Senegal.
10. Subhash Chandir, Danya Arif Siddiqi, Hamidreza Setayesh, Aamir Javed Khan. Impact of COVID-19 lockdown on routine immunisation in Karachi, Pakistan. *Lancet Glob Health.* 2020;8: e1118-e1120.