

# Coronavirus Outbreak in Nigeria and DPT3 Vaccination

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## Abstract

COVID-19 has its origin in China. The index case in Nigeria was an Italian citizen from Milan confirmed on the 27<sup>th</sup> of February 2020. Ever since, there has been a continuous increase in number of cases. The pandemic has exposed the weakness in our health system and port monitoring system. When the timeline and targets of the Sustainable Development Goals were being decided, it was not imagined that the world would experience a pandemic like COVID-19. Nigeria is ranked 160 out of 166 countries in the 2020 SDG Index with a score of 49.3. Nigeria tops the list of countries in which about two-thirds of children aged 12-23 months have not yet been reached with a single dose of the diphtheria, pertussis and tetanus (DPT) vaccine. Nigeria is one of the African countries most affected by the COVID-19 pandemic. This paper assessed the patterns of COVID-19, the third dose of DPT (DPT3) coverage as well as the plausible link between vulnerability to COVID-19 and DPT3 coverage. The paper analysed the NCDC daily situation reports from inception to October 10, 2020. Immunization coverage for DPT3 in Nigeria is lower than in sub-Saharan Africa. Vulnerability to COVID-19 cuts across the states irrespective of whether there has been an increase or decrease in DPT3 coverage. The attending disruption in healthcare services consequent on the pandemic is likely to negatively affect the DPT3 coverage rate across the country.

**Keywords:** Pandemic, DPT3, Vulnerability, Immunization

### **Introduction**

The Chinese authority alerted the World Health Organisation (WHO) on the 31<sup>st</sup> of December 2019 of an outbreak of several cases of pneumonia in Wuhan City, Hubei Province of China. It was regarded as an epidemic until there was a rapid escalation of the outbreak which also spread to countries outside China. The WHO then first declared it as a 'Public Health Emergency of International Concern' (PHEIC) on the 30th January 2020 and later as a pandemic on the 11th of March 2020. The pandemic is a corona-related virus which was tagged COVID-19. Nigeria confirmed the first case of COVID-19 on the 27th of February 2020 in Ogun State. The index case was an Italian citizen who returned from Milan. He was confirmed by the Virology Laboratory of the Lagos University Teaching Hospital, part of the Laboratory Network of the Nigeria Centre for Disease Control. The fact that this index case was not detected at the port of entry is an indication that Nigeria as a nation did not pay good attention to the January 30 declaration by the WHO of the outbreak in China as a Public Health Emergency of International Concern. Indeed, it was a missed opportunity as the country did not have in place a system to track and monitor the movement of travellers, even after the disease had been declared a PHEIC (FGN, 2020, p 18). This fact was partly alluded to in the mid-term review of the activities of the Presidential Task Force on COVID-19.

The Sustainable Development Goals (SDGs) came into effect in 2015 and this year marks one-third of the timeline expected for the attainment of the various targets. The pandemic will have profound implications on progress towards the SDGs (Sachs et al., 2020, p. 1). The SDGs are the world's shared goals for sustainable development, and COVID-19 makes them more relevant than ever (Sachs et al., 2020, p. 2). Nigeria is ranked 160 out of 166 countries in the 2020 SDG Index with a score of 49.3, suggesting that the country is on average 49% of the way to the best possible outcome across the 17 SDGs (Sachs et al., 2020, p. 27). The SDG index score signifies a country's position between the worst (0) and the best or target (100%) outcomes. The COVID-19 pandemic was not envisaged so its effect has not been taken into consideration. The pandemic will likely negatively impact progress towards most of the SDGs in the short and medium-terms, including in high-income countries.

Vaccines are universally considered as one of the most successful and cost-effective medical interventions ever introduced (WHO, 2017, p. 1; WHO 2020 p. 1). A strong immunization system is an integral part of a well-functioning health system. The issue of immunization is a component of SDG3 – Ensure healthy lives and promote well-being for all at all ages. Target 3.8 intends to “Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all”. DPT 3 is an element of essential vaccines. The focus of this paper is on children aged 12-23 months and the third dose of DPT. The 12-23 months period is the typical age by which children should have received all basic vaccinations.

At stake is critical progress made over the last decade in reaching more children and adolescents with a wider range of vaccines, including in Nigeria. UNICEF (2020), in a press release stated that, despite this progress, Nigeria still contributes 30 per cent of the global number of unimmunized children between the ages of 0 and 5. Indeed, the global vaccination coverage rate with the third dose of the vaccine against diphtheria, tetanus and pertussis (DPT3) has plateaued at 85 per cent since 2010 (UNICEF, 2020). DPT3 is part of the basic vaccination every child is expected to receive. UNICEF, in a July 15 press release, further stated that the chance that a child born today will be fully vaccinated with all the globally recommended vaccines by the time s/he is 5 years is less than 20%. The disruption in healthcare services as a result of the COVID-19 pandemic is likely to affect some children, either skipping or entirely missing life-saving vaccines such as their third dose of DPT (WHO, 2020 p.1). The Bill and Melinda Gates Foundation described the COVID-19 pandemic as a “mutually exacerbating catastrophe”. This is very apt in that the disease is debilitating and more or less forces the government to move resources from hitherto intended purposes to trying to manage the disease, also people stopped seeking healthcare to avoid being infected.

In the words of the UNICEF Executive Director, Henrietta Fore, vaccinating every child is a daunting challenge which the COVID-19 pandemic has made worse (UNICEF 2020). Therefore, she called for all hands to be on deck to halt further deterioration in vaccine coverage by reinforcing vaccination services before the lives of children become threatened by other outbreaks. Indeed, the world cannot afford to trade one health crisis for another (UNICEF, 2020).

According to GAVI (2020a, p. 1), about two-thirds of children who are not receiving the basic vaccinations, i.e children who have not yet been reached with a single dose of diphtheria, pertussis or tetanus (DPT) containing vaccine, are concentrated in Nigeria (20%), India (18%), Pakistan (9%), Indonesia (7%), Democratic Republic of the Congo (DRC) (6%) and Ethiopia (5%). Nigeria is one of the African countries most affected by the COVID-19 pandemic (GAVI, 2020b p.1). The uptake of immunization services has been adversely affected since the onset of the pandemic in Nigeria (GAVI, 2020b p. 2), though no vaccine stock-out has been reported at federal and state levels. The government is however intensifying plans to scale up routine immunization through the use of a combination of the following strategies: appointment-based approach; geocoded mobile health vans; and targeted, temporary fixed-post immunization sessions (GAVI, 2020b p. 2). In Indonesia, there was a disruption in immunization services in nearly 84% of health facilities due to the COVID-19 pandemic (GAVI 2020a, p.1).

Surgo Foundation computed a community vulnerability index with the intent to measure the ability of the community to mitigate, treat, and delay transmission of the virus and to reduce the social and economic impacts on the society. The Africa COVID-19 Community Vulnerability Index was inspired by the computation of the US COVID-19 Community Vulnerability Index. The overall COVID-19 Community Vulnerability Index (CCVI) is made up of seven themes:

- 1) Age (Number of people aged 65+);
- 2) Epidemiological (Non-communicable diseases, HIV prevalence, infectious diseases prevalence);
- 3) Fragility (Civil unrest, food insecurity);
- 4) Health System (Health system strength, health system capacity, and access to health care);
- 5) Population density;
- 6) Socioeconomic (Access to information, education, poverty, and unemployment); and
- 7) Access to transportation and housing (Household crowding, improved housing, sanitation, access to transportation, and road connectivity).

The CCVI gives clues on areas that are vulnerable so that appropriate solutions to help such communities can be developed. Apart from the overall CCVI, the following are the sub-themes of interest in this paper: Epidemiological, Health System and

Socioeconomic. In this context, the paper assesses the patterns of COVID-19 infection, DPT 3 vaccine coverage, and the plausible link between vulnerability and incidence of COVID-19.

### **Methodology**

The study relied on the use of secondary data and literature synthesis. Secondary data on the COVID-19 pandemic in Nigeria was obtained from the National Centre for Disease Control COVID-19 daily situation reports from February 27 to October 10, 2020. This time frame covers the period from the onset of the pandemic in Nigeria to the most recent date before the submission of the paper. The DPT3 immunization coverage was obtained from the World Bank and the Nigeria Demographic and Health Surveys for the last two rounds – 2018 and 2013. This paper, in assessing the patterns of COVID-19, the third dose of DPT (DPT3) coverage, as well as the plausible link between vulnerability to COVID-19 and DPT3 coverage, used percentages, proportions and charts.

### **Strategies Adopted to Mitigate COVID-19 in Nigeria**

On March 17, 2020, President Muhammadu Buhari established the Presidential Task Force (PTF) on COVID-19 to coordinate and oversee Nigeria's multi-sectoral inter-governmental efforts to contain the spread and mitigate the impact of COVID-19 in Nigeria. The entire world is still in the early phase of the COVID-19 pandemic, and the impact on the economies and the people is still hazy. There are short-term and long-term consequences of the pandemic. Some of the short-term effects include the economy declining into recession in many countries and many people becoming vulnerable to extreme poverty as a result of the effect of some of the strategies being adopted to mitigate the pandemic. Children may also not be exempted from the effects of the pandemic; this may be through missed opportunities for vaccination. The fact that Nigeria was recently declared polio-free may be reversed if some of the children who are under 2 years miss any dose.

The PTF was under the chairmanship of the Secretary to the Government of the Federation (SGF) alongside line ministries and agencies related to the mitigation of the COVID-19 pandemic, with a mandate spanning 6 months. According to the Federal Government of Nigeria (FGN, 2020, p. 19), the responsibilities of the PTF include: developing guidelines and best practices for COVID-19 response; establishing a national budget and determining the funding sources for Nigeria's

response to COVID-19; determining key nationwide policy and enforcement; managing the negative economic impact of the COVID-19 pandemic to the country as well as ensuring national security throughout the response.

The PTF effectively aligned the over 50 federal government ministries, departments and agencies towards the goal of reducing COVID-19 morbidity and mortality in Nigeria, while improving linkages and partnerships between these organizations. The strategic objectives of the National Pandemic Response Plan as developed by the PTF include: providing a coordinated and effective national and sub-national response to the COVID-19 pandemic, reduction of COVID-19 related morbidity and mortality, mitigating pandemic-related impacts on infrastructure (critical, economic and health) as well as facilitating post-pandemic recovery and rehabilitation operations. There has been some level of effective collaboration with subnational governments (state governments) such that all the sub-national governments have in place committees similar to the PTF, all working towards the goal of achieving a single national response. The synergy between the PTF and the various committees at the subnational level is a good window of opportunity to pursue in our quest to attain the Sustainable Development Goals.

This crisis is unprecedented in severity, at least since the influenza epidemic at the end of World War I, and is still very ambiguous in its course (Sachs et al., 2020, p. 1). The pandemic has raised the bar concerning the infrastructure at various levels of health facilities across the globe. The weakness in terms of having adequate infrastructure is not just peculiar to developing countries but also affects developed countries like USA and China. The difference is in the ability of governments to respond to emerging needs, as evidenced in the time taken by China to create health facilities within a few days.

Resulting from the pandemic, the PTF has inspired an unprecedented commitment of resources to public health. Through the Federal Ministry of Humanitarian Affairs, Disaster Management and Social Development and its agency, NEMA, the PTF successfully implemented social interventions aimed at aiding individuals and households in need and cushioning the effect of the lockdown on individuals and small-scale business owners. These interventions were in three categories: food, cash-transfer and economic support. In the first 3 months of the activities of the PTF, a total of 30,876.3 metric tonnes of food items were distributed to 3,795,500 households from the Strategic Grains Reserve (FGN, 2020, p. 13).

The Social Investment programmes were intensified within the first 3 months of the pandemic. A total of 730,177 eligible household beneficiaries in 24 states received cash disbursements under the Conditional Cash Transfer Scheme and other existing programmes. Also, 2.2 million small-scale traders benefitted from Government Enterprise and Empowerment Programme (GEEP) because of the COVID-19 pandemic (FGN, 2020, p. 38). Trader and Market 'Moni' loans were also given to 43,117 beneficiaries in 11 states (Lagos, Ogun, Plateau, Bauchi, Yobe, Zamfara, Katsina, Edo, Cross-River, Enugu and Imo) and the FCT to mitigate the effect of various levels of lockdown and restrictions across the country (FGN, 2020, p. 39). The number of vulnerable households on the National Social Register increased from 2.6 million to 3.6 million within the first 3 months of the activities of the PTF (FGN, 2020, p. 14).

Nigeria closed her airports to international flights from the 21st of March, with a total lockdown imposed for an initial period of 14 days on the 30th of March in the FCT, Lagos and Ogun states and eased on the 4<sup>th</sup> of May. Kano State was also put on total lockdown for 14 days from the 27<sup>th</sup> of April 2021. This period of lockdown, had gruelling effects on the people and the economy of the country. President Muhammad Buhari, in his speech on the 13<sup>th</sup> of April, 2020 alluded that the government was aware that the lockdown would severely disrupt the livelihoods and bring undue hardship to the people and the communities in general. The attempts of the government and other stakeholders to offer palliatives seem not to have achieved the desired objective. This is partly because many Nigerians are engaged in the informal sector and their income is earned mostly daily. At this period, it is becoming evident that the country has moved into the stage of community transmission, consequently, the PTF is encouraging every person to take responsibility. The emphasis has been more on enlightenment on the need to wear the face mask, avoid large gatherings and wash the hands with soap frequently.

Some of the challenges faced by the PTF in the first 3 months include lack of structured data, inadequate healthcare infrastructure, increased citizen apathy, disrupted supply chains, increased cost of procurement, among others (FGN, 2020, p. 14). The issue of structured data cannot be overemphasised, especially as reflected in the daily situation reports. The format of the Situation Reports has improved and the information being provided in recent months is more consistent than it was at the onset of the pandemic.

### **COVID-19 and Health System**

The pandemic revealed the poor state of the public health system in Nigeria, like in many other countries. This the chairperson of the PTF on COVID-19 alluded to in one of his briefings. The capacity for adequate testing and contact tracing is very weak and quarantine facilities are virtually not available. The reality is that as a country, Nigeria appears to be ill-prepared for any infectious disease of the scale of COVID-19. Culture must also have contributed to the spread of the virus; in many parts of the country, the practice of physical distancing is strange to the people's way of life. People take undue risks by meeting in large groups at weddings, religious services, funerals, and other group occasions. They also often do not, or cannot, adhere to strict hygiene measures, including hand-washing and the wearing of masks. The virus is thus easily spread to large numbers of people (Sachs et al., 2020, p. 3). The disruption of immunization services is likely to cause an increase in numbers of susceptible individuals and could raise the outbreak of vaccine-preventable diseases such as diphtheria (World Health Organization, 2020b, p. 1)

### **Vaccine Uptake**

Immunization remains one of the most important public health interventions and a cost-effective strategy to reduce both the morbidity and mortality associated with infectious diseases (Sally and Kenu, 2017; Udessa, Sena and Berhanu, 2018, p. 1; Degarege, et al., 2020, p. 2). The World Health Organization in 1974, through the World Health Assembly resolution WHA 27.57, initiated the Expanded Programme on Immunization which included immunization against diphtheria, pertussis and tetanus (Sally & Kenu, 2017). DPT is one of the most widely used combinations of antigens. Coverage of vaccines like measles, diphtheria, pertussis and tetanus (DPT) are health system indicators.

The goal of vaccination of all children is utopian; in India, only about half of the children aged 12-23 months received the full schedule of routine vaccinations even after about three decades of the Universal immunization programme in the country (Francis, et al., 2018, p, 6560).

Complete immunization with existing routine vaccines against tuberculosis, diphtheria, pertussis and tetanus, amongst others, are

essential to avert the associated mortality, morbidity and to prevent future outbreaks of these vaccine-preventable diseases (Francis et al., 2018, p, 6560; Sally & Kenu, 2017). The onset of the COVID-19 pandemic must have disrupted the delivery of immunization services. The disruption, even for a brief period, will result in increased numbers of susceptible individuals and may raise the likelihood of outbreaks of vaccine-preventable diseases (World Health Organization, 2020, p. 1). Such outbreaks will cause a greater burden on the health system of many countries already strained by the COVID-19 response.

There are supply and demand-side factors that are associated with routine vaccination uptake. According to Laxminarayan and Ganguly (2011; cited in Francis et al., 2018, p.6560) the supply-side factors include: lack of trained personnel to manage and deliver immunization services, poor relationship between health care workers and mothers, inconvenient timing or location of immunization services and even vaccine stock-outs; while the demand-side factors include child's gender, the order of birth, place of delivery, maternal age at childbirth, parental education, religious preference, and household wealth and location (urban or rural). The non-socio-demographic demand-side issues such as awareness regarding the need for and timing of routine childhood vaccinations, fears regarding some or all routine vaccines, and parental beliefs regarding false contraindications to routine vaccinations have been reported as reasons linked to partial vaccination and non-vaccination of Indian children (Ghosh and Laxminarayan 2017 , cited in Francis et al., 2018, p, 6560).

### **Immunization in Nigeria**

Nigeria is one of the 10 countries where most of the unvaccinated and under-vaccinated children live (Global Vaccine Action Plan, 2017. p.1). The Nigerian Expanded Programme on Immunization (EPI) was initiated in 1979, five years after it was launched by the World Health Organization. The routine immunization coverage rate in Nigeria as at 2017 is 33%, thus the National Primary Health Care Development Agency (NPHCDA) declared a state of emergency on routine immunization (Momoh and Awa-Agwu, 2020). Consequently, the National Emergency Routine Immunization Coordination Centre (NERICC) was established at the federal level with counterparts across the 36 states of the federation. The aim of the routine immunization centres was for the country to attain a routine

immunization coverage of 84% by 2028 (Momoh and Awa-Agwu, 2020).

Early in the year 2020, the federal government launched the Integrated Medical Outreach Programme (I-MOP) to address the gaps in routine immunization coverage. The programme includes the conduct of immunization fixed posts, temporary posts, mobile teams and medical outreach sessions which will be implemented in the 409 lowest performing local government areas in Nigeria. The first round was planned for the last week in March with other rounds planned for April 20 and 1<sup>st</sup> of June 2020. The onset of COVID-19 has disrupted this and other programmes and interventions aimed at reducing the immunization coverage gap, especially among the vulnerable population.

In Nigeria, the National Immunisation Schedule recommends that a child should receive four doses of Oral Polio Vaccine (OPV), three doses of Hepatitis B Vaccine, three doses of Diphtheria, Pertussis and Tetanus (DPT) vaccine and one dose each of Bacille Calmette – Guerin (BCG) against severe forms of tuberculosis, measles and yellow fever. Consistent and regular immunisation drives at the community level is an active approach that could significantly increase the number of children immunised in Nigeria.

UNICEF, in the press release of July 2020, quoted the Executive Director of The National Primary Health Care Development Agency (NPHCDA), that Nigeria as a country has a full stock of routine immunization vaccines and as such is in a strong position to ensure children receive vaccinations for preventable diseases. This is an indication that there are plans put in place to ensure that the immunization coverage rate is increased.

In Nigeria, numbers show that routine immunizations in the first 6 months of 2020 dropped compared to the same period in 2019 – indicating a deterioration in important routine vaccination coverage, due to COVID-19 (UNICEF, 2020). Vaccine coverage in 2020 is reported to be dropping to levels last seen in the 1990s (Bill and Melinda Gates, 2020 p. 4; UNICEF, 2020). In some cases, these vaccinations are simply delayed, and children can “catch up” later without much consequence. However, some infections, such as measles, spread easily, and even short-term disruptions can lead to immediate increases in illness and death (Bill and Melinda Gates Foundation, 2020, p. 37).

To improve on the coverage for vaccination of children, with emphasis on DPT3, the UNICEF Country Representative in Nigeria opined that there will be a need to build the confidence of caregivers as well as provide protection for them while they are providing the services (UNICEF, 2020). The WHO recommends that for catch-up immunization activities that might have been impeded by the COVID-19 pandemic, priority should be placed on vaccine-preventable diseases such as diphtheria (World Health Organization, 2020).

### **Comparison of DPT3 Immunization Coverage**

Immunization coverage levels and trends are used to monitor the performance of immunization services locally, nationally and internationally; to guide strategies for the eradication, elimination and control of vaccine-preventable diseases (Sally & Kenu, 2017). The DPT3 is a marker for immunization coverage within and across countries (World Health Organization, 2020). In 2012, the WHO proposed the ambitious goal of immunizing 9 out of every 10 infants with the DPT3 vaccine by the year 2020 (Degarege et al., 2020, p. 2).

An examination of the coverage for DPT3 in Nigeria and selected countries show that over the years, Nigeria has continued to have the lowest coverage rate (Table 1). It is worrisome that the coverage in Nigeria is even lower than the situation in sub-Saharan Africa. Nevertheless, Nigeria is making some progress in increasing the coverage for DPT3. The disruptions resulting from COVID-19 pandemic are likely to reduce the momentum in increasing DPT3 coverage.

In examining the vulnerability of states across the country, Table 2 shows that the 3 most vulnerable states based on the overall COVID-19 Community Vulnerability Index (CCVI) are in the North-East geopolitical zone [Gombe, Yobe & Borno states]. The 3 least vulnerable states are in the South-South [Rivers & Delta states] and South-East [Imo State] geopolitical zones.

**Table 1: Immunization, DPT3 (% of children aged 12-23 months) 2000 -2019**

Year	China	Egypt	Ethiopia	United Kingdom	Indonesia	India	Vietnam	Ghana	Nigeria	Sub-Saharan Africa
2000	85	98	30	91	75	58	96	88	29	51.4
2001	86	99	32	91	76	59	96	79	27	51.5
2002	86	97	35	91	70	59	75	78	25	53.1
2003	86	98	37	91	71	61	99	80	29	56.0
2004	87	97	40	92	71	63	96	80	33	59.2
2005	87	98	44	91	72	65	95	84	36	62.4
2006	93	98	46	92	72	65	94	84	40	64.4
2007	93	98	50	92	73	64	92	94	42	66.7
2008	97	97	54	92	77	70	93	93	53	69.2
2009	99	97	58	93	78	74	96	94	63	72.6
2010	99	97	61	94	81	79	93	94	54	71.1
2011	99	96	65	95	81	82	95	91	48	71.6
2012	99	93	62	95	87	82	97	92	42	70.7
2013	99	97	59	95	92	83	59	90	43	69.7
2014	99	94	61	95	88	85	95	98	43	70.8
2015	99	93	64	95	84	87	97	88	42	70.4
2016	99	95	66	94	84	88	96	93	53	72.2
2017	99	94	69	94	85	89	94	99	55	72.8
2018	99	95	68	94	85	90	75	97	56	72.9
2019	99	95	69	93	85	91	89	97	57	73.5

Source: <https://data.worldbank.org/indicator/SH.IMM.IDPT?locations=NG>

**Table 2: COVID-19 community vulnerability(ccvi) by state and DPT3 immunization**

State	Population Density per Sq. Km	CCVI (Overall and Selected)*				Percentage of Children aged 12-23 months who received DPT 3**		
		Overall CCVI	Epidemiological theme	Health System theme	Socio-economic theme	2018	2013	Diff 2018 -2013
Abia	804	0.2	0.6	0.3	0.2	80.4	79.8	0.6
Adamawa	120	0.8	0.6	0.7	0.7	65.9	49.7	16.2
Akwa Ibom	715	0.7	0.7	0.8	0.5	62.2	65.3	-3.1
Anambra	1188	0.6	1.0	0.2	0.0	87.3	78.5	8.8
Bauchi	156	0.8	0.2	0.8	0.8	32.1	12.5	19.6
Bayelsa	260	0.5	0.6	0.9	0.2	54.5	67.7	-13.2
Benue	189	0.5	0.5	0.4	0.3	58.7	29	29.7
Borno	78	0.9	0.1	1.0	0.7	36.0	12.4	23.6
Cross River	480	0.5	0.7	0.1	0.4	64.1	76.1	-12.0
Delta	314	0.4	0.7	1.0	0.5	71.7	62.2	9.5
Ebonyi	480	0.6	0.0	0.1	0.3	82.4	80.3	2.1
Edo	230	0.1	0.8	0.1	0.4	80.7	79.6	1.1
Ekiti	495	0.3	0.3	0.2	0.1	93.0	79.0	14.0
Enugu	588	0.2	0.4	0.3	0.4	80.9	81.8	-0.9
FCT	364	0.3	0.9	0.6	0.6	73.5	69.1	4.4
Gombe	208	1.0	0.4	0.9	0.8	25.8	36	-10.2
Imo	1015	0.4	0.9	0.4	0.4	79.5	83.1	-3.6
Jigawa	286	0.9	0.0	0.6	0.9	35.7	7	28.7

State	Population Density per Sq. Km	CCVI (Overall and Selected)*				Percentage of Children aged 12-23 months who received DPT 3**		
		Overall CCVI	Epidemiological theme	Health System theme	Socio-economic theme	2018	2013	Diff 2018 -2013
Kaduna	187	0.7	0.9	0.9	0.6	31.9	43.7	-11.8
Kano	689	0.6	0.1	0.4	0.8	45.9	18.9	27.0
Katsina	386	0.7	0.1	0.2	0.9	33.7	14.6	19.1
Kebbi	137	0.8	0.3	0.9	0.9	10.6	2.8	7.8
Kogi	144	0.1	0.2	0.5	0.3	55.6	75.9	-20.3
Kwara	97	0.3	0.3	0.4	0.6	54.5	65.1	-10.6
Lagos	3721	0.0	1.0	0.1	0.1	90.8	77.4	13.4
Nassarawa	99	0.1	0.5	0	0.6	59.7	34.1	25.6
Niger	86	0.6	0.6	0.7	0.8	38.8	37.3	1.5
Ogun	359	0.3	0.7	0.6	0.0	50.3	56.9	-6.6
Ondo	335	0.1	0.5	0.3	0.3	77.0	62.5	14.5
Osun	495	0.0	0.4	0.0	0.1	83.5	82.8	0.7
Oyo	271	0.2	0.8	0.8	0.2	44.3	47.7	-3.4
Plateau	166	0.4	0.4	0.3	0.5	71.8	46.3	25.5
Rivers	688	0.4	0.9	0.6	0.1	74.5	69.2	5.3
Sokoto	179	0.9	0.2	0.7	1.0	7.2	2.6	4.6
Taraba	57	0.8	0.8	0.5	0.7	41.7	21.4	20.3
Yobe	74	1.0	0.3	0.5	0.9	29.0	11	18
Zamfara	155	0.9	0.1	0.8	1.0	10.8	5.6	5.2

Source: \* <https://www.precisionforcovid.org/>; \*\*Nigeria Demographic and Health Survey 2018 & 2013.

The coverage of DPT 3 worsened across 11 states of the federation. Though an increase in DPT3 coverage was reported in 25 states and the FCT, the coverage in 11 of these states was still lower than 50%, indicating that there is still the need to intensify efforts at increasing DPT3 coverage across the federation. A detailed examination shows that Gombe State is the worst in terms of decline in DPT3 coverage and going by the CCVI (100%), it is a highly vulnerable state to COVID-19. The other two states most vulnerable to COVID-19 are Kaduna State (70%) and Kogi State (10%). Paradoxically, the top 3 states with the highest percentage increase in DPT3 coverage are at least 80% vulnerable to the pandemic. These are Jigawa State (90%), Kebbi State (80%) and Borno State (90%). The coverage in these 3 states with the highest increase has a DPT3 coverage lower than 40 per cent of children age 12-23 months. Vulnerability to COVID-19 cuts across the states, but for those states that though are improving but the current coverage rate for DPT3 is still less than 50% of children aged 12-23 months calls for the attention of all stakeholders. The attending disruption in healthcare services consequent on the pandemic is likely to tip in the negative the DPT3 coverage rate across the country.

Most of the confirmed COVID-19 cases are in the South-west geopolitical zone with one-third of the cases occurring in Lagos State (Table 3). The epicentre of the pandemic in the North Central geopolitical zone over the period under review is the FCT, with about half of the cases in the zone. Gombe, Kaduna, Enugu and Rivers states are the epicentres in the North-East, North-West, South-East and South-South geopolitical zones respectively. In terms of fatality from the pandemic FCT, Borno State, Kano State, Ebonyi State, Edo State and Lagos State are the epicentres in North-Central, North-East, North-West, South-East, South-South and South-West geopolitical zones.

The incidence of the pandemic peaked in July, though the pace of the pandemic is slowing down; as of October 10, we are yet to revert to the incidence level as at April 2020. Thus Nigeria can be said to be close to flattening the COVID-19 pandemic curve (Figure 1). The lockdown appears not to have yielded the objective of slowing down the pandemic, rather the call for personal responsibility appears to be more effective as indicated by the figures from July 2020.

**Table 3: Percentage of total confirmed cases, discharged cases, and deaths from COVID-19 pandemic (February 27 to October 10)**

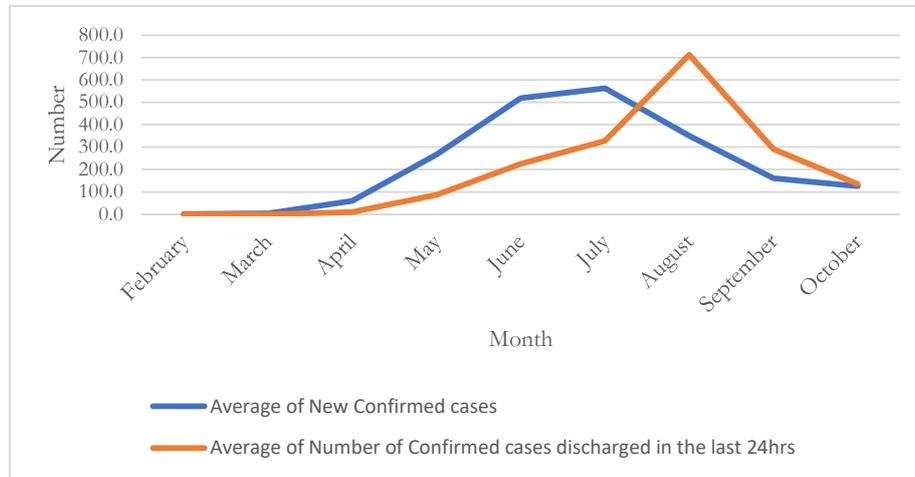
Geopolitical Zone/State	CONFIRMED CASES		DISCHARGED CASES		DEATHS	
	As % of Zone	As % of the Country (N=59,540)	As % of Zone	As % of the Country (N=38,764)	As % of Zone	As % of the Country (N=1,090)
<b>North Central</b>		<b>19.26</b>		<b>26.31</b>		<b>15.87</b>
Benue	4.20	0.81	4.05	1.07	5.78	0.92
FCT	49.71	9.58	51.49	13.55	45.66	7.25
Kogi	0.04	0.01	0.03	0.01	1.16	0.18
Kwara	9.02	1.74	9.48	2.49	14.45	2.29
Nasarawa	4.04	0.78	3.19	0.84	8.09	1.28
Niger	2.28	0.44	2.37	0.62	6.94	1.10
Plateau	30.71	5.92	29.40	7.73	17.92	2.84
<b>North East</b>		<b>4.63</b>		<b>6.36</b>		<b>9.63</b>
Adamawa	9.01	0.42	7.66	0.49	16.19	1.56
Bauchi	25.85	1.20	27.73	1.76	13.33	1.28
Borno	26.33	1.22	28.21	1.80	34.29	3.30
Gombe	32.10	1.48	30.24	1.92	22.86	2.20
Taraba	3.85	0.18	3.61	0.23	5.71	0.55
Yobe	2.87	0.13	2.55	0.16	7.62	0.73
<b>North West</b>		<b>9.70</b>		<b>14.30</b>		<b>14.59</b>
Jigawa	5.73	0.56	5.56	0.79	6.29	0.92
Kaduna	43.06	4.18	42.91	6.13	25.79	3.76
Kano	30.16	2.92	30.35	4.34	33.96	4.95
Katsina	15.10	1.46	15.73	2.25	15.09	2.20
Kebbi	1.61	0.16	1.52	0.22	5.03	0.73
Sokoto	2.82	0.27	2.62	0.37	10.69	1.56
Zamfara	1.51	0.15	1.32	0.19	3.14	0.46
<b>South East</b>		<b>6.80</b>		<b>9.79</b>		<b>8.17</b>
Abia	22.04	1.50	22.97	2.25	8.99	0.73
Anambra	6.18	0.42	5.77	0.56	21.35	1.74
Ebonyi	25.75	1.75	26.55	2.60	33.71	2.75
Enugu	31.63	2.15	30.19	2.96	22.47	1.83
Imo	14.41	0.98	14.52	1.42	13.48	1.10
<b>South-South</b>		<b>12.97</b>		<b>19.05</b>		<b>22.84</b>
Akwa Ibom	3.83	0.50	3.77	0.72	3.21	0.73

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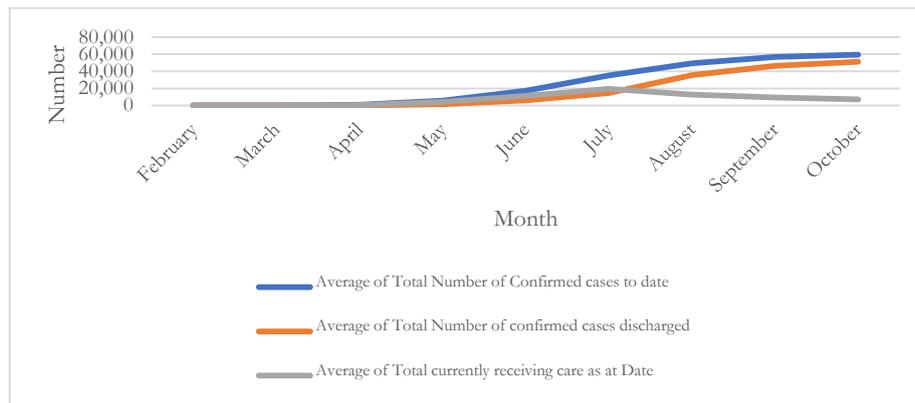
Geopolitical Zone/State	CONFIRMED CASES		DISCHARGED CASES		DEATHS	
	As % of Zone	As % of the Country (N=59,540)	As % of Zone	As % of the Country (N=38,764)	As % of Zone	As % of the Country (N=1,090)
Bayelsa	4.90	0.63	5.09	0.97	8.84	2.02
Cross river	1.06	0.14	0.96	0.18	3.21	0.73
Delta	22.60	2.93	23.54	4.48	19.68	4.50
Edo	33.44	4.34	33.43	6.37	41.37	9.45
Rivers	34.18	4.43	33.21	6.33	23.69	5.41
<b>South West</b>		<b>46.65</b>		<b>24.19</b>		<b>28.90</b>
Ekiti	1.16	0.54	3.32	0.80	1.90	0.55
Lagos	71.24	33.23	31.45	7.61	59.37	17.16
Ogun	6.78	3.16	18.55	4.49	8.89	2.57
Ondo	5.83	2.72	10.77	2.61	11.43	3.30
Osun	3.18	1.48	8.69	2.10	5.71	1.65
Oyo	11.81	5.51	27.23	6.59	12.70	3.67
<b>Grand Total</b>		100.00		100.00		100.00

*Source:* Author's computation based on NCDC Situation Daily Reports

The number of confirmed cases continues to increase, though the slope is reducing (Figure 2). The fact that the gap between confirmed cases and cases discharged is reducing is an indication that the pandemic is being managed appropriately. This may be an indication of the efficacy of the treatment regimes used in managing the confirmed cases. The good news is that, in principle, COVID-19 is controllable. The pandemic could be stopped in its tracks if every infected person were kept safely away from susceptible individuals during the period of infectiousness, which is roughly one to two weeks. If that were to happen, the vast majority of those currently infected would recover, while a small proportion, perhaps around 1%, would die from the illness (Sachs et al., 2020, p. 2). The only reason why there continues to be an increase in new infections is that there are individuals who are asymptomatic and are infecting susceptible individuals. Indeed, this is the time for more caution and personal responsibility, especially as the airports are now open. The pandemic has been reported in 216 countries globally. The truth is that no one is free until all are free.



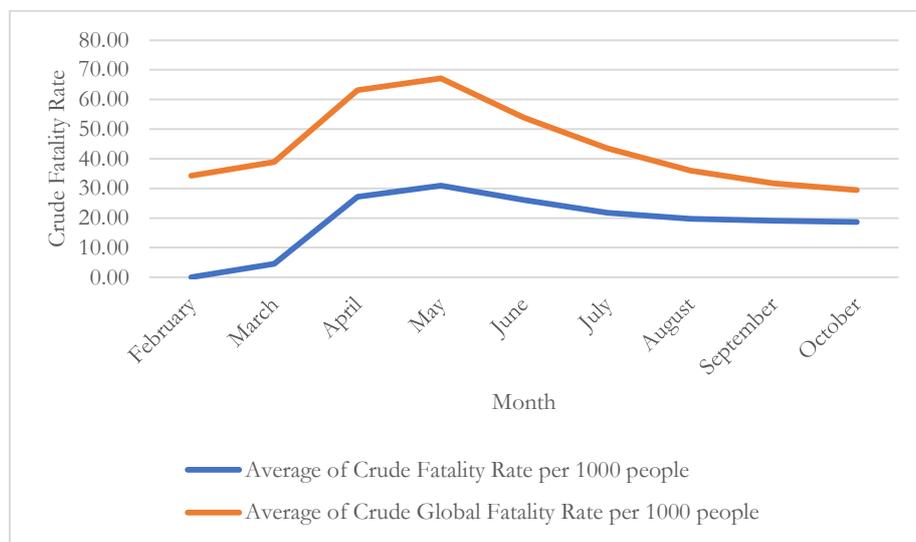
**Figure 1: Average confirmed and discharged cases in the last 24hrs daily by month**



**Figure 2: Monthly average of confirmed, discharged and cases still receiving care**

Nigeria has recorded lower fatality per 1,000 people than the situation globally (Figure 3). At the onset of the pandemic in Nigeria, case fatality resulting from the pandemic was rising at almost the same rate as the global situation. Between May and July, case fatality was reducing steeply globally than it was in Nigeria. At the peak of the fatality in May 2020 globally about 67 per 1000 people were dying, while in Nigeria, the fatality rate was about 31 cases per 1000 people. The fatality in Nigeria may be low relative to the global picture partly because the people most affected by the pandemic are those between 31 and 40 years (Nigeria Centre for Disease Control, 2020, p. 1).

Finally, the level of cooperation and collaboration between the PTF at the federal level and the respective COVID-19 management committee in each state is worthy of emulation as the country continues in its quest not to leave anyone behind, including ensuring every child aged 12-23 months receives all vaccinations and the DPT3 in particular.



**Figure 3: Comparison of global and national fatality (Feb-Mid-Oct 2020).**

**Conclusion**

The fact that DPT3 immunization coverage is lower in Nigeria than the coverage in sub-Saharan Africa is worrisome. The DPT3 coverage has worsened in some states relative to what they were as at 2013. The onset of COVID-19 has disrupted implementation of the federal government’s Integrated Medical Outreach Programme to address the gaps in routine immunization coverage.

The delay in implementing the closure of airports allowed the entry of the COVID-19 index case to the country, thus policy decision making must be smarter and faster to mitigate consequences of future pandemics in the country. The use of the lockdown mechanism to mitigate the spread of infectious diseases is problematic in a country like Nigeria without the requisite data to identify the most vulnerable people. There is a need to implement the National Social Protection Policy. Strategies must be put in place to mitigate the disruption in

regular healthcare services in the face of an epidemic or pandemic. The likelihood of disruption in services will be minimal if every health worker is fully kitted in the course of delivering services.

Encouraging individuals to take personal responsibility appears to be a potent measure for stopping the epidemic, or at least reducing the number of new infections to small numbers. The spike at the onset of the pandemic was partly due to poor handling of the process of contact tracing coupled with individuals giving wrong addresses. Government must institute intensive public health services and encourage and promote good hygienic practices among the population.

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