The Socio-Economic Reasons that led to the Biggest Vaccination Campaign Against the Yellow Fever Virus.

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The Federal Republic of Nigeria belongs in the West part of Africa with a population of 186 million people (Nigeria Country Profile, 2018). Nigeria has suffered over the years with many infectious outbreaks due to the poor effectiveness of the health care system, which is insufficient (Welcome, 2011). The medical equipment, the health care centers, and the personnel of the centers are not enough, and they have a lot of defects (Welcome, 2011). It is important for a country to rely on the effectiveness of its health care system in meeting its health goals. But in Nigeria most of the cases people cannot rely on the health system since it has a lot of problems. A very recent attempt to control one of the many outbreaks that this country is facing is yellow fever. Yellow fever is an acute viral hemorrhagic disease transmitted by mosquitos that have been infected (Yellow Fever, 2018). This campaign started at the end of 2017 and it aims to vaccinate more than 25 million people until the end of the 2018 (Largest yellow fever vaccination campaign in Nigeria's history under way – UN health agency, 2018). In a country with very poor health system, this vaccination campaign is important for controlling and preventing people from yellow fever. The health care system of Nigeria is suffering due to the lack of organization, equipment, and personnel. This lack has resulted to a yellow fever outbreak that needs to be control. Because of the bad health system, the outbreak started spreading quickly leading to the need of a solution. This paper will examine the reasons that led to the biggest vaccination campaign for yellow fever in the history of Nigeria.

The low control of mosquitoes' density, deforestation, low immunity of people, and the movement of people in and out of the boarders, has led to the outbreak of yellow fever which has put the population of Nigeria in high risk. Yellow fever is high fever

virus that is transmitted through infected mosquitos (Shearer et al., 2017). The symptoms include jaundice, fever, headaches, nausea, muscle pain, fatigue, and vomiting (Yellow fever, 2018). Moreover, if not treated properly yellow fever can lead to death, and in many cases, this can happen within 7 to 10 days after the patient has been affected (Yellow fever, 2018). Yellow fever outbreaks happen when already infected people move to bigger cities with high mosquito density and where many people have very low immunity due to poor nutrition or other diseases (Shearer et al., 2017). With this way, yellow fever can be transmitted throughout the population very quickly. In many cases the infected patient will have some of the symptoms, such as fever and nausea, but after 4 days the symptoms will be gone. But if the patients move to the second phase which is more toxic, then the symptoms start becoming more intense and they die after a week (Yellow fever, 2018). Moreover, the diagnosis of this disease is very difficult and in many cases it can be confused with other infectious diseases, such as malaria, and the patient might be treated with the wrong treatment (Yellow fever, 2018) Eventhough the disease can be fatal the prevention of yellow fever is a very effective vaccine, but once someone is infected with yellow fever there is no anti-viral drug for it (Shearer et al., 2017). So infected patient get treatment for fever, kidney and liver failure, and dehydration which helps for the treatment of yellow fever (Yellow fever, 2018). But because the health care of Nigeria is not efficient enough to treat all its patient, most of them die (Welcome, 2018).

The weak health care of Nigeria has led to yellow fever virus outbreak. The current yellow fever outbreak in Nigeria is active in seven states, such as Niger, Kogi, Zamfara, Kebbi, Kwara, Kano, Nasarawa (Nigeria Center for Disease Control, 2018).

Moreover, in both Africa and South America it is estimated that 90% of cases occur only in Africa, which is a very high percent (Hamlet et al., 2018). Furthermore, the yellow fever virus causes approximately from 51,000 to 380,000 cases per year, and out of these cases 19,000 to 180,000 result to death (Hamlet et al., 2018). It is a very serious virus that needs to be controlled, otherwise it could lead to a massive outbreak. The Nigerian health system is divided in primary, secondary, and tertiary healthcare levels and each level is controlled by different governments (Embassy of the Kingdom of the Netherlands in Nigeria, 2015). The most important health care level is the primary level which the foundation of all three levels, and it is controlled by the Local Government Areas (Embassy of the Kingdom of the Netherlands in Nigeria, 2015). This level is the least funded of all three levels, therefore the government cannot properly organize and finance the primary health care system, creating a very weak system (Embassy of the Kingdom of the Netherlands in Nigeria, 2015). Their system has 5 hospital beds per 10,000 people which is not enough comparing to the 186 million people that live in Nigeria (Embassy of the Kingdom of the Netherlands in Nigeria, 2015). And considering that Nigeria is facing a huge explosion of population growth this number is insignificant. Except yellow fever Nigeria faces with other important outbreaks, such as Malaria. Malaria is responsible for the 60% of outpatients in the health facilities, 30% of childhood deaths, and 11% of mothers dying in birth (Embassy of the Kingdom of the Netherlands in Nigeria, 2015). So, there is a huge need for the government of Nigeria to improve their health care system since their population is suffering out of untreated diseases and without offering prevention methods, such as vaccines.

Nigeria is one of the fastest growing economies of the world, but the living conditions of the people are terrible. The Federal Republic of Nigeria has a lot of natural resources, such as oil and petroleum (UNICEF Nigeria - Overview - The Nigerian situation, 2018). It is considered the 6th biggest producer of petroleum and it is also the 8th larger exporter globally (UNICEF Nigeria - Overview - The Nigerian situation, 2018). But eventhough they have high reach of natural resources that could improve the living conditions of people, it does not. Moreover, despite the fact that they have other areas of economy, such as agriculture, coconut processing, and palm oil production, they heavily rely on the oil and petroleum resources, resulting to the decline of the other resources (UNICEF Nigeria - Overview - The Nigerian situation, 2018). The economic growth in Nigeria is not so fast as the economic growth of the urban areas, resulting to the enormous growth of the population (Akinwale et al., 2014). This increased growth of the population has led to the problem where the country of Nigeria cannot provide social and health services to all these people (Akinwale et al., 2014). The numbers of poor health, poverty, and unemployment have increased leading people to slum living (Akinwale et al., 2014). The quality of the residents of this people vary from a simply cabin to more permanent houses, but they do not have electricity, access to clean water or sanitation systems which are very important (Akinwale et al., 2014). They live in very poor conditions with very limited accesses to basic needs, such as food or water, resulting to the decline of the low immunity system and making them vulnerable towards diseases. Moreover, the Nigerian Demographic and Health Survey (NDHS) do not investigate slum population, leading to the lack of health-related data for this people. (Akinwale et al., 2014). This may lead to the unrealistic data assignment of the

healthcare resources, living slum population untreated of medical care (Akinwale et al., 2014).

The weak healthcare system and the poor living conditions in Nigeria has led to biggest vaccination campaign of yellow fever. In Africa the preventive vaccination campaigns after the 1940s led to the reduction of the virus, but it was not enough since a lot of out breaks have occurred over the years (Shearer et al., 2017). The resurgence of the yellow fever virus brought out the urge for many vaccination campaigns, since after 2016 they were a lot of cases in many countries (Shearer et al., 2017). In 2016 two urban yellow fever outbreaks took place in Luanda and in Kinshasa. Angola has one of the biggest international exportation systems and because the yellow fever virus can easily spread out to other countries, a new strategic plan was in need (Yellow Fever, 2018). The Eliminate Yellow Fever Epidemics (EYE) Strategy was created and their mission was to prevent yellow fever outbreaks by vaccinating 1 billion people by the end of 2016 (Update on yellow fever in Nigeria, 2018). But eventhough the EYE strategy was running, a new urban outbreak of yellow fever took place in Nigeria (Update on yellow fever in Nigeria, 2018). People have started fearing that this new out break will have the same results as the outbreak that took place in Angola in 2016 (Update on yellow fever in Nigeria, 2018). The 2016 outbreak was the worst outbreak that Angola has faced the last 30 years, affecting more than 3,625 people (Yellow fever situation report, 2018).

So, because the Federal Republic of Nigeria was afraid that this outbreak will spread globally, they decided to create a vaccination campaign in alliance with the World Health Organization (WHO) (Largest yellow fever vaccination campaign in

Nigeria's history under way – UN health agency, 2018). The initial emergency response of the yellow fever outbreak vaccinated 3 million people, but the virus continued to spread (Largest yellow fever vaccination campaign in Nigeria's history under way – UN health agency, 2018). By the end of March 2018, the Nigeria State has dealt with 1,640 cases, and 47 deaths. Out of the 47 deaths only 10 deaths where confirmed that yellow fever caused them, but still they had to create a more effective campaign that will vaccinate more than 80% of the population (The Nigeria Center for Disease Control, 2018). So, the 2017-2018 campaign that is taking place in Nigeria is a 10-year plan that aims to eliminate yellow fever outbreaks (Update on yellow fever in Nigeria, 2018). This campaign was created with the alliance of UNICEF, WHO, EYE, Gavi, and other 50 partners (Update on yellow fever in Nigeria, 2018). And aims to vaccinate 25 million people by the end of 2018 (Nigeria set to vaccinate 25m people against Yellow Fever, says WHO, 2018). This current effort to eliminate yellow fever outbreaks is the biggest vaccination campaign in the history of Nigeria. It will vaccinate people in urban and rural areas regardless the economic situation of the population.

Yellow fever is a high fever virus that is transmitted through infected mosquitos, and it is divided in two phases. In the first phase the infected patients show signs of fever and nausea and recover after 4 days, and in the second phase, which is more toxic, the symptoms of the patient start becoming more severe and after 7 to 10 days they die. Because Nigeria has dealt with a lot of outbreaks due to the poor health care system that is very weak and because of the poor living conditions especially in urban areas, their government decided to create one of the biggest vaccination campaign. The campaign

is aligned with more than 50 partners and eventhough it is a 10 year-plan, it aims to vaccinate more than 25 million people by the end of 2018.

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