

*Full length Research paper*

# **Covid-19 and Challenges of Management of Infectious Medical Waste in Nigeria: A Case of Taraba State**

**\*<sup>1</sup>Oruonye ED and Ahmed AY<sup>2</sup>**

Department of Geography, Taraba State University, Jalingo, Nigeria.

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The outbreak and spread of covid-19 pandemic has triggered awareness in people about how vital the hospital waste management process in every single country can be. The increasing number of covid-19 infection in Nigeria is already putting increasing pressure on the healthcare systems in the country. The highly infectious nature of the coronavirus would require a complex and special protocol of handling and managing the infectious medical waste generated such as confinement (bins, bags etc.) and availability of proper storage and disposal facilities. In Nigeria, all efforts towards containing the outbreak and spread of the corona virus is directed towards establishing testing, isolation and treatment centres/facilities. Little or nothing is said about the handling and safe disposal of infectious waste generated from the management of the disease. This study has examined covid-19 and the challenges of management of infectious medical waste in Nigeria using the case of Taraba state. The study used interview and secondary materials online to generate data used in the study. The study findings reveal that the medical waste is spread out beyond hospitals. Findings from the study reveals that Jalingo the state capital has no any officially approved dumpsite in the metropolis. Also the tertiary healthcare facilities in the State has no proper safe disposal facilities of infectious medical waste at the moment. Other challenges include the various myths surrounding the reality of the covid-19 pandemic, poor enforcement of infectious medical waste guidelines and lack of political will on the part of the government. Based on the findings, the study recommends effective enforcement of the guidelines on the safe disposal of infectious, use of PPEs by all waste collection workers and creation of environmental department in every hospital to handle all infectious medical waste.

**Keywords:** Corona virus, Covid-19, Infectious medical waste, Personal protective equipment and Taraba State

## **INTRODUCTION**

The Health sector has been generally recognized globally as one of the large waste generators. The World Health Organization estimates that at least 10% of waste generated in health care facilities is infectious and improper disposal of such waste expose human beings and the environment to serious health risks (NESREA, 2017). The WHO observed that about 23% of death cases are attributable to environmental hazards associated with poor infectious waste disposal.

All over the world, the covid-19 pandemic has seen more

and more people admitted to hospital, where the high infection rate of the virus makes use of personal protection equipment (PPE) vital for healthcare workers. PPE includes single-use gloves, aprons and gowns, surgical masks, respirators and face protectors in the form of glasses, goggles or face shields. The type of PPE used in any country and at any time depends on the task being performed and the setting. For example, nurses on a Covid-19 ward are advised to wear disposable gloves, an apron, a gown, a respirator and face protection, while community-based care-givers are advised to wear gloves, aprons and a mask.

Solid waste such as personal protective equipment (PPE) represents the most considerable volume of waste generated by the covid-19 pandemic. It is important to note

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\*Corresponding Author Email: [eoruonye@gmail.com](mailto:eoruonye@gmail.com)

that any waste that has been in contact with a facility that is housing a covid-19 patient or a person who has been exposed to the coronavirus, including decontamination materials, is to be treated as infectious medical waste. Limited PPE availability due to increased international demand and increasing cost poses a risk for medical waste collection workers (Ramusch, 2020). Secondly, it might be difficult to achieve social distancing of employees for example due to sorting line configurations or in cabs of collection vehicles. Cutler (2020) observed that the world will be drowning in medical waste in 2020 due to the 2019 coronavirus (covid-19), and the consequences of this glut will have a far reaching and profound impact on sustainable medical waste management practices for years to come.

The increasing number of covid-19 infection in Nigeria is already putting increasing pressure on the healthcare systems in the country. The Federal Government of Nigeria is already soliciting cooperation of private individuals and corporate organization to support in managing the pandemic. Recently, the Catholic Bishops of Nigeria volunteered about 420 of its missionary healthcare facilities (including clinics, hospitals and dispensaries) across the country to be used in containing the covid-19 pandemic. This rapid spread of the coronavirus will certainly lead to higher quantities of medical waste generation across the country, especially infectious wastes from the various isolation centres and health facilities used in managing the covid-19 disease. This increasing high infectious medical waste is fast overwhelming existing medical transport and disposal infrastructure around most hospitals in the country.

The highly infectious nature of the coronavirus would require a complex and special protocol of handling and managing the infectious medical waste generated such as confinement (bins, bags etc.) and availability of proper storage facilities. Increased infectious medical waste generation will put pressure on storage, collection, treatment and disposal facilities of the wastes. The management of covid-19 related infectious medical waste requires special standard which demands that persons involved in handling potentially infectious solid waste shall be properly equipped with personal protective equipment (PPE) used for medical waste handling. The waste workers (especially collection workers) are required to take occupational health and safety precautions to avoid any possible infections by waste streams / equipment.

In China, specifically Wuhan, where the novel coronavirus first emerged, the government did not just build new hospitals for the influx of patients; they also constructed a new medical waste plant and deploy 46 mobile waste treatment facilities to handle the waste (Calma,2020).The hospitals there generated six times as much medical waste at the peak of the outbreak as they did before the crisis began. The daily output of medical

waste reached 240 metric tons, about the weight of an adult blue whale (Calma,2020). However, in Nigeria, all efforts towards containing the outbreak and spread of the corona virus is directed towards establishing testing, isolation and treatment centres/facilities. Although the Federal Ministry of Environment conducted capacity building training of environmental health officers who are expected to scale it down at the local level and disinfection and decontamination of public office at the Federal Capital Territory (FCT), not much has been done about the handling and safe disposal of infectious waste generated from the management of the disease at the State level. This is a serious concern that deserve special attention if the war on the spread of the pandemic will be achieved.

Nigeria as a country lack sound medical waste collection, treatment and disposal facilities, most often land filling is the only disposal method available. The infectious nature of covid-19 related waste will further exacerbate the poor medical waste management challenges in the country.

Although the CDC maintained that medical waste from Covid-19 can be treated the same way as regular medical waste, regulations on how to treat such waste vary by location and can be governed by state health and environmental departments, as well as by the public health management system in the country. Generally, to make sure contaminated trash from health care facilities doesn't pose any harm to the public before going to a landfill, it's typically sterilized with steam, or chemically disinfected and burnt (Calma,2020).

Before the outbreak of the covid-19 pandemic in Nigeria and most of West African countries, medical waste in most of the health facilities are handled by vulnerable junior staff who are mostly illiterate, and lack proper knowledge of sorting out very hazardous medical waste and also lacking proper PPE to protect themselves. In other parts of the country, especially in semi-urban and rural areas, informal collectors and waste pickers are responsible for the collection and disposal of medical waste. Certainly, these category of people cannot handle the disposal of infectious medical waste generated in covid-19 related health facilities. The Nigerian national environmental standards and regulations enforcement agency (NESREA) has come up with guidelines for the handling and disposal of all covid-19 related waste in the country. This study therefore examines some of the challenges of management of the infectious waste especially in terms of compliance to the provisions of the waste disposal guideline.

### **Conceptual Clarification NESREA**

The National Environmental Standards and Regulations Enforcement Agency (NESREA) is an Agency of the Federal Ministry of Environment in Nigeria charged with responsibility to enforce all environmental laws, guidelines, policies, standards and regulations in Nigeria; and to

prohibit processes and the use of equipment and/or technology that undermine environmental quality. NESREA also has the responsibility to enforce compliance with the provisions of international environmental agreements, protocols, conventions and treaties to which Nigeria is a signatory. The agency was established by the NESREA establishment Act 2007 LFN and NESREA Act 2018 as amended. The Agency has come up with guidelines for handling infectious waste within the context of coronavirus (covid-19) in environmental matters. The guidelines state that all materials including Personal Protective Equipment (PPE) used for the purposes of treatment of covid-19 are considered an infectious waste. It also noted that the increase in the spread of the corona virus will lead to a surge in the amount of healthcare waste that will be generated and that containment and disposal of same may pose challenges until the pandemic is over.

### **NESREA Guidelines**

The guideline is an effort to align with international best practice of handling medical waste generated from the treatment of highly contagious diseases such as Covid-19. The guideline suggests the following routine procedures:

- i. waste handlers should wear appropriate Personal Protective Equipment (PPE) such as boots, aprons, long-sleeve gowns, thick gloves, mask, or face shields.
- ii. generators are responsible for packaging the waste for transport to treatment facilities; and
- iii. each containerized infectious waste must be securely closed.

The following are required to be implemented by the Health Care facilities generating infectious wastes to ensure Environmentally Sound Management;

- i. Health care facilities treating COVID-19 patients should provide sealed receptacles for the waste materials;
- ii. Contaminated beddings should undergo steam sterilization and patient care wastes should be incinerated.
- iii. Disposable Personal Protective Equipment (PPE) used by healthcare workers involved with COVID-19 patients should be incinerated.
- iv. Only properly kitted workers are allowed to evacuate or incinerated; transport healthcare waste from isolation centers.
- v. Tertiary Health Care facilities are obliged to receive the infectious waste for incineration; and
- vi. Isolation centers currently without healthcare waste incinerators should liaise with the nearest tertiary Health Care facilities to incinerate their waste.

### **Infectious Medical Waste**

Medical waste is any kind of waste that contains infectious material (or material that is potentially infectious). This

definition includes waste generated by healthcare facilities like physician's offices, hospitals, dental practices, laboratories, medical research facilities, and veterinary clinics. Medical waste can contain bodily fluids like blood or other contaminants. The 1988 *Medical Waste Tracking Act* defines it as waste generated during medical research, testing, diagnosis, immunization, or treatment of either human beings or animals. Some examples are culture dishes, glassware, bandages, gloves, discarded sharps like needles or scalpels, swabs, and tissue (Med Pro Disposal, ND). Infectious medical waste on the other hand can be regarded as any contaminated waste that can cause harm to human, animal health, or to the environment and include paper, plastic, glass, metal, or fabrics.

NESREA defines an infectious waste as "waste suspected to contain pathogens e.g. laboratory cultures, waste from isolation wards, tissues (swabs), materials, or equipment that have been in contact with tubing, catheters, IGS toxins, live or attenuated vaccines, soiled plaster and other materials contaminated with blood, urine, sputum, faeces of infected patients" (NESREA, 2020).

### **MATERIALS AND METHODS**

The data used in this study include primary and secondary data. The primary data include interviews with critical stakeholders such as officials of NESREA in the State and staff of the tertiary healthcare facilities. The study also employed participant observations of the centres in Taraba State that were used for the isolation of suspected covid-19 persons (stadium and NYSC orientation camp at Sibre). Secondary materials obtained through web-based generic search engines were also used. The data generated were analysed using content analysis. The study focuses on understanding the challenges of managing infectious medical waste in Nigeria using the case of Taraba State.

### **RESULTS**

#### **Covid-19 Outbreak in Taraba State**

The outbreak of covid-19 was recorded in Taraba state when six confirmed cases was reported for the first time by the Nigeria Centre for Disease Control (NCDC) on Sunday 26<sup>th</sup> April, 2020. The results are from samples taken from persons quarantined by the State Task Force on covid-19, who were kept at the state isolation centre, located at Sibre in Jalingo. They persons are among the 130 interstate travellers from Bauchi, Kano, Jigawa, Borno, Ogun and Lagos states, intercepted at the state borders. As at 19<sup>th</sup> May 2020, the 17 cases reported in the state were successfully discharged after treatment and the state did not record any fatality to the pandemic. The wake of the

outbreak of the covid-19 in the country, all the state took the initiative to come up with their various response measures. Taraba state has the following response measures put in place to contain the pandemic;

- i. Constitution of State Committee on COVID-19 to preside over the state initiatives to stop the spread of the pandemic.
- ii. The state government completed a 100-bed capacity isolation centre at the State NYSC camp with the support of Access Bank Plc.
- iii. Introduction of total lockdown which compels everybody to stay at home every day except on Wednesdays and Saturdays. Only workers on essential duties are exempted.
- iv. Empowerment of security agencies to enforce the lockdown and the introduction of mobile courts to prosecute offenders.
- v. Setting up an isolation center at the current NYSC camp which is at the outskirts of the town.
- vi. Sensitization and state wide broadcast on various media channels like Taraba television, Taraba radio, cable networks, state government website, social media and others through broadcast of Jingles daily to sensitize the citizens.
- vii. Provided state emergency contact lines for covid-19 to the general public.
- viii. Tightening of the state borders with neighbouring states to prevent influx of people through border communities such as Karim entrance, Numan-Jalingo route, Sardauna -Cameroon border, Wukari-Benue, Adamawa-Jalingo, Kurmi-Cameroon border, etc.
- ix. Fumigation of some places such as the NYSC isolation center.
- x. Distribution of food and non-food items to the 168 wards of the state, each received by its local government chairman.
- xi. Supporting religious groups such as both CAN and Muslim Council with finances to help in ensuring effective sensitization.
- xii. Contact tracing of index cases with the deployment of additional resources and manpower in the state.
- xiv. Distribution of protective kits in the state against covid-19
- xv. Seeking of 2.5 billion loan by State Government to fight covid-19.
- xvi. Plans to bring in sophisticated mobile testing machine for covid-19 to help speed up testing.
- xviii. Distribution of palliative materials donated to the state by organizations like NEDC, NYSC, etc. The State government received over N100m worth of food and non-food

items for 3,828 households from The Victims Support Fund of TY Danjuma Foundation.

- xix. Introduction of school on air to teach students while at home via TTV and TSBS

### **Challenges of Management of Infectious Medical Waste in Taraba State**

Despite all the effort made by different stakeholders in the state and country with regard to managing waste in the country, there has been inadequacy that still prohibits the state and country from managing infectious medical wastes in a scientific and more-coordinated way. The risks of infectious medical waste are beyond comparison to the risks of general non-hazardous wastes. Incineration of hazardous wastes leads to the emission of dioxin, furans, and even mercury is produced. This poses environmental degradation and induces health risks as well.

Findings from the study reveals that Jalingo the state capital has no any officially approved landfill or dumpsite in the metropolis. Many waste collectors collect the waste for households and some healthcare facilities and dump them in the numerous illegal open dumpsites in the town. The inability of having an officially designated dumpsite will amount to individuals and groups disposing their waste (irrespective of their contents) anywhere and anyhow in the open dumpsites. This will equally amount to directly or indirectly circulating the infection within the community and in the case of covid-19, will reinforce the community transmission of the virus.

The findings of the study also reveal that the tertiary healthcare facilities in the State has no proper safe disposal facilities of infectious medical waste at the moment. The Taraba State Specialist hospital modern incinerator provided the WHO intervention has broken down. Before the intervention, the hospital used to transport all its medical waste to Yola town in Adamawa state (about 172km further north) for proper disposal. At the moment, the hospital is collecting the medical waste generated and working out the best practices for handling the collected medical waste. The standard protocols would require disinfecting the waste before disposal but at the hospital, the waste are usually burnt at a very high temperature before they are buried.

The study findings reveal that the medical waste is spread out beyond hospitals. Some people who have minor symptoms are recovering at home. Others who are asymptomatic might not know that the trash they are throwing out could be contaminated. That means people may be generating plenty of virus-laden trash without knowing it. This is a serious challenge to sanitation workers, as the virus can persist for up to a day on cardboard and for 2 to 5 days on metal and plastic surfaces, according to one study of the virus in lab conditions (Calma, 2020).

Another important challenge to the management of infectious medical waste is the issue of the various myths surrounding the reality of the covid-19 pandemic is also a challenge. Despite all the sensitization and advocacy campaign by government officials using various media houses, traditional and religious leaders, there are quite a number of people who still do not believe that the corona virus exist. Some of this myths include 5G network helps to spread the disease, consuming bleach or disinfectant kills the virus, only older adults and young people are at risk, covid-19 is just like any other flu, home-made herbal mixtures can cure and protect against covid-19 and the virus does not survive in hot temperature environment among others. These myths make it difficult for people to obey simple safety rules to contain the pandemic.

The enforcement of policy regulations is usually slow because of our usual ways of doing things in the State and country at large. Naturally the enforcement team is supposed to include mobile courts where offenders are tried on the spot and if any is convicted, then the law takes its course. So, the poor enforcement leads to ineffective management of infectious waste in the state.

The state does not have the political will to effectively manage waste in the state. This can be seen in the very little or no money allocated for the purpose. Thus, the state and its residents does not want to spend money on waste management issues as it does not consider it very important. Residents dispose their waste anywhere along the street and drainages and in some cases in the illegal open dumpsites within the town.

Infectious medical waste has negative impact on the health of patients, health workers, and the general public. The emissions from the incinerators or different other management techniques contribute to the spread of corona virus and other infectious diseases.

Nigeria as a country lack facilities of occupational health training, due to which, drivers or other waste management team members are unaware of the waste composition that they have been dealing with. Inadequate provision of PPEs for medical workers especially the infectious medical waste collectors and handlers. This is further made worse by the increase in global shortages in PPEs. Most healthcare facilities do not have well defined policies on waste management.

## CONCLUSION

This study has examined covid-19 and the challenges of management of infectious medical waste in Nigeria using the case of Taraba state. The study used interview and secondary materials online to generate data used in the study. The study findings reveal that the medical waste is spread out beyond hospitals. Findings from the study reveals that Jalingo the state capital has no any officially

approved dumpsite in the metropolis. Also the tertiary healthcare facilities in the State has no proper safe disposal facilities of infectious medical waste at the moment. Other challenges include the various myths surrounding the reality of the covid-19 pandemic, poor enforcement of infectious medical waste guidelines and lack of political will on the part of the government. The Covid-19 pandemic has triggered awareness in people about how vital the hospital waste management process in every single country can be. However, all these problems can be overcome if the hospital waste management policies are strong enough. Not just governmental bodies, but private sectors, NGOs, the community need to work together to ensure that sustainable waste management is done in an efficient manner.

## RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made;

- i. Every facility (including private personal houses, hotels or public buildings) used in treating or isolation of persons infected with covid-19 are to be properly disinfected with chlorine disinfectant solution or any other antiviral elements.
- ii. Effective enforcement of the guidelines on the safe disposal of all infectious and covid-19 related waste. Capacity-building among health workers should be undertaken from time to time.
- iii. Person Under Investigation (PUI) or Person Under Monitoring (PUM) should be encouraged to segregate all medical waste (face masks, wipes, tissues etc). Where possible the monitoring agency should provide yellow medical bags and collection services for PUI/PUM related waste.
- iv. People handling health care waste in particular should wear appropriate gear, including boots, aprons, long-sleeved gowns, thick gloves, masks, and goggles or face shields, according to recommendations from the World Health Organization.
- v. There is need to have an environmental department in every hospital to handle all infectious medical waste which must be treated before final disposal.

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