MANAGEMENT OF BIOHAZARDS AND PANDEMICS: COVID-19 AND ITS IMPLICATIONS IN THE CONSTRUCTION SECTOR
(An article review)

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Summary

Controlling biohazards and pandemics in the construction sector is a critical issue that has piqued the interest of public health, environmental engineering, and civil engineering professionals. Despite the wide range of environmental professionals, there is still a challenge in containing the current Corona Virus pandemic in COVID-19 from 2019 to 2021 [1] [2] [3] [4]. However, the control cuts across from the pandemic era to the post-pandemic era [5] [6] [7]. The pandemic has also been noted to have affected the educational system globally [8], specialised workplace attitudes and general mental health [9], and crisis-driven-governance of the populace [10] [11]. Despite that it has also affected the globe, there have been some progress made by various disease control organisations over the years. These lessons learnt include other
epidemics and pandemics-ranging from SARS COV-2, Ebola Virus to COVID19 pandemic [12] [13] [14] [15]. There are also environmental concerns that are related to pollution of plastics-from disposed nose marks, and face shields during COVID19 pandemic era [16] [17]. There are also concerns that these plastic wastes are harmful to the-ecosystem [18] [19] [20] [21]. As such, both the environmentalist and the environmental-engineer are tasked with resolving various environmental issues. These issues include atmospheric pollution, the control of water, soil, environmental-sanitation and the social and environmental impact of these solutions. Based on the management aspect, these include the control of pandemics, the-control of arthropod-borne diseases, the elimination of industrial health hazards,-and the effect of technological advances on the environment. Different researchers-have recommended that some policy protocols be considered in the construction-industry for both biohazards and pandemics like COVID19 using nose masks [22] [23] [24]. Generally, the engineers are concerned with the challenges, concepts, awareness,-utility, management of engineering facilities and development of new technologies [25] [26] [27] [28]. These technologies are used to develop construction-materials like pipes and hoses [29] [30] [31] [32] as well as 3D-printed face shields [33] [34] [35]. During the pandemic, the engineers were tasked with-developing innovative solutions such as additive manufactured face shields [36]-[37], incubators [38] [39] and other assistive technologies [40] [41] [42]. Also, new techniques have also been developed by bio-engineers based on COVID19-[43] [44]. However, these developments have increased the issues such as plastic-wastes and electronic wastes in the environment [45] [46] [47]. Thus, proper-waste disposal, waste control and recycling attitudes [47] [48] [49] are recommended-in the pre and post COVID19 pandemic era. Having a solid public health of the populace is every nation’s most valuable asset, and it is the basis-upon which the people’s whole production capacity is built [50]. Over a decade-ago, Essenberg [51], reported that about 180,000 workers die and 110 million are injured in workplace accidents each year, but this has decreased in recent times. Occupational health and safety is well structured in developed nations. However,-in developing countries, it is on the average, substantially worse than in developed-countries [50]. According to Seagle [52], this is due to a lack of resources in-the context of an economic downturn, the implementation of remedial and preventative-actions to improve occupational safety and health, and management’s attitude toward worker health and safety [53] [54] [55]. Construction workers-are exposed to a variety of health and safety hazards. These could include exposure-to materials that can cause serious sickness and have a long-term effect on-the worker’s health. This study aims to raise awareness about the potential biological-risks of several common materials that construction workers may come into contact with on the job. Large wood dust particles, for example, can readily-become stuck in the nasal canal and are known to cause nasal cancer in woodworkers. Figure 1 shows the route of entry of biohazards in the human body. Inhaling wood dust reduces lung function, which leads to chronic lung illness. Solvents, like other chemicals, may be utilised in a variety of construction-related
operations. Furthermore, asbestosis is a lung defect caused by exposure to a dusty environment, particularly in harsh weather or at an asbestos production factory. Solvents evaporate quickly. Exposure to liquid or vapour forms can have both long-term and short-term health consequences for workers. The health effects will be mostly determined by the chemical in the solvent and the amount of time spent in contact with it. Solvents are primarily inhaled, however they can also be absorbed through the skin. Short-term solvent exposure can result in headaches, nausea, sleepiness, and dermatitis. A worker's kidneys, liver, and skin may be permanently damaged if they are exposed to a solvent on a regular basis. Solvent exposure can cause personality changes, sleep difficulties, short-term-memory loss, and dementia, and the toxic effects on the neurological system are a major worry. By definition, a hazard is a situation that offers a risk to life, health, property, or the environment. Chemical Hazards, Biological Hazards, Environmental Hazards, Health Hazards, Natural Hazards, Fire Hazards, and Workplace Hazards are the broad categories of hazards. However, the focus of this study will be on biological risks. An organism, or a chemical derived from an organism, that poses a threat to (mainly) human health is referred to as a biological-hazard or biohazard [56]-[63]. Biohazards are samples of microorganisms, viruses, or toxins (from a biological source) that can pose a threat to human or harm the human health. They could also arise from medical wastes or other trash dumps and it may also contain compounds that are toxic to animals-[64]-[69]. Rodents, insects, bacteria, viruses, moulds, yeasts, and fungi are examples of biological risks. Infections, allergies, and poisoning can all be caused by these [70]. A proper understanding of biohazards and pandemics by the public as well as political leaders is required for effective control against the damage caused by biohazards. Biohazards can be managed at the source (engineering-control), from the source to the worker, and at the workplace (environmental-control) [71]-[79]. This paper explores the management of biohazards and pandemics in the construction industry, taking Ibadan as a case study. Section 1 introduces the concept of biohazards and pandemics. Section 2 presents the materials and methods for the study. Section 3 presents the results while Section 4 discusses the results. Section 5 presents some policy implications while Section 6 presents the concluding remarks. The main objectives are to identify potential biohazards and pandemics like COVID-19 pandemic having Corona Virus as a current global concern. Also, the study identifies preventive actions to be taken and selects appropriate control measures for biohazards and pandemics to promote higher quality of health and safety, as well as safer worksites in the construction industry. 2. Data and Sampling Methods 2.1. Data Description The study used questionnaires and covered a wide range of topics, including the many strategies for issues of pandemics, controlling biological
risks, their applications, and comparisons with other studies in the field. 2.2. Study Area The scope of this study was limited to biohazards in the construction industry. 2.3. Sample Study This research was carried out under the auspices of engineering and environmental-control. 2.4. Data Collation The data collation was carried out by using only data from the construction sites. 2.5. Data Analysis The statistical analysis of the processed questionnaires that were interpreted into tables was done utilising a bar chart and statistical index. 3. Results 3.1. Construction Firms That Ensure Availability and Functionality of Muster Points or Warning Sign-Posts In construction, every engineering activity should ensure safety first and have muster sites, warning signs, and an effective danger communication approach because safety is paramount. 3.2. Construction Firms with PPE-Conforming Workers The utilisation of Personal Protective Equipment (PPE) and protective clothes are critical in the construction industry. 3.3. Construction Firms with Projects Using HSE/Trained Health Personnels Some construction businesses strive to save money by not hiring Health and-Safety Executives (HSE) and skilled health experts such as nurses, safety officers and doctors on site, which may be putting the lives of their workers in risk. 3.4. Responses on Construction Firms Having First-Aid Box on Site In the event of an emergency, the first-aid kit is quite useful. 3.5. Responses of Construction Firms That Do Routine Check-Up It is paramount that public health concerns like pandemics and biohazards are controlled. 3.6. Responses on Construction Firms Having On-Site Comfort Facilities During every infrastructural development on a construction site, there is generally-a site house, but there may not always be a comfort room for the workers, particularly in developing nations. 3.7. Responses of Construction Firms with Employees’ Insurance Policy The principle of insurance policies in the construction industry has struggled to acquire traction in emerging countries such as India and Nigeria. 3.8. Responses of Construction Firms That Recorded Workers Exposed to Biohazards From the study, it was important to investigate on the workers exposure to biohazards. 3.9. Responses of Construction Firms To Have Compensated Hazardous-Affected Employees-Engineering is a significantly risk-involved profession which does not exclude the risk of pandemics and biohazards, particularly during construction activities. 3.10. Responses on Construction Firms to HSE/Standard Legislation A Safety Officer must be appointed if there are twenty (20) or more employees, according to the Health and Safety at Work Act of 1974 [80]. 3.11. Responses on Organizing Seminar/Workshops on Pandemics and Biohazards in the Construction Sector Sensitization and training of employees is very important in the construction sector. 3.12. Research on Pandemics and Biohazards in the Construction Sector The research on pandemics and biohazards in the construction sector has been conducted in this study by comparing data from Scopus obtained in 2021 (in Figure 20(a), Figure 21(a)) and data obtained in 2016 (in Figure 20(b), Figure 21(b)).

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