

Waste Management Workers' Safety Concerns during the COVID-19 Pandemic in Ghana

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Abstract

Waste management is one of urgent challenges in the world. In rapidly growing cities of developing countries like Accra, Ghana, waste collection is done without sufficient protection of workers. This situation became worse when the COVID-19 pandemic began to threaten the health and safety of waste collection workers. This paper aims to examine waste management workers' safety concerns during the COVID-19 pandemic in Ghana. To better understand waste management workers' safety concerns during the pandemic, we used the questionnaire survey. Our questionnaire survey was conducted among 60 waste management workers in Accra, the capital city of Ghana. The study then discusses how municipal waste management authorities can ensure safety of waste management workers during the pandemic. Our results showed that 58% of the respondents were worried about the COVID-19 pandemic, while 20% were not even sure of the existence of the COVID-19 pandemic. Besides their worry, we also found that about 40% of the respondents had access to face masks/shields at their workplace, and 30% had hand sanitizers. This paper highlights that providing more advanced safety protocols in terms of workers daily operations and safety measures will enable a safe working environment for the workers even in terms of future pandemics.

Keywords

COVID-19, Waste Management Worker, Waste Collection, Ghana, Safety Protocols

1. Introduction

Waste management is one of the major challenges humanity faces today [1]. About 1.9 billion tons of solid waste is generated annually in the world [2]. In Sub-Saharan Africa, approximately 62 million tons of solid waste is generated

annually. In rapidly growing cities like Accra in Ghana, the amount of daily waste generation is estimated to double from about 2,600 metric tons in 2010 to more than 4,400 metric tons by 2030 [3].

Ghana's waste collection was carried out by district and municipal authorities. However, due partly to the low collection rate (about 50%), the central government privatized waste collection services in 1999 [4]. Since then private companies like Zoomlion Ghana emerged and have managed solid waste [5]. These companies hire informal waste collection workers called *kaya bola* who empty waste bins by using tricycles or trucks [6]. They are sometimes stationed at community waste collection points to ensure proper waste disposal by individuals. In doing so, they face high risks of contracting infectious diseases and injury [7].

When the novel coronavirus (COVID-19) pandemic began to affect Ghana and western Africa, waste management workers faced unpredictable health/safety risks and delayed work efficiency [8]. In handling waste with the risk of COVID-19 infection, workers were required to follow safety protocols against COVID-19, including the regular use of hand sanitizers. In response, some waste management workers complained about inconveniences in carrying out their tasks [9]. Although recorded cases of COVID-19 in the Sub-Sahara African region remained comparatively low in the first year compared to European countries and the U.S., Ghana experienced a constant rise in COVID-19 cases despite various government efforts [10]. Also, in the midst of the pandemic, the Ghanaian government decommissioned some landfill sites which displaced over 300 waste pickers [11].

The World Health Organization in 2015 had developed its first global and comprehensive guidance document called "Safe Management of Wastes from Health-care Activities". All member countries belonging to the World Health Organization were mandated to adopt it. Ghana adopted it on January 2016 into its national healthcare waste management medium development policy which seeks to protect the environment as well as human health. It requires countries to establish a regulatory framework and minimize waste through recycling. It emphasizes the importance of planning waste management, handling processes, properly transport and store before treatment and final disposal. The document was aimed at managers to provide appropriate vehicles for transporting the waste, secure environmentally friendly waste disposal sites, and do sufficient monitoring and evaluation of the waste collectors [12].

However, for these guidelines to be more effective in rapidly growing African cities like Accra, it is imperative to understand the working conditions of waste management workers under the COVID-19 pandemic. This study, therefore, examines the safety concerns of waste management workers during the COVID-19 pandemic in Ghana's capital, Accra. It further provides suggestions to address these safety concerns.

Past studies examined waste management workers' safety in various countries.

For example, in Brazil, researchers [13] found that about 90% of their respondents, who were waste collectors, did not have a place to claim about their concerns and needs over working conditions. For example, these respondents needed PPEs most. Regarding COVID-19 impacts, Reference [14] found that a social stigma existed toward seasonal workers in Bangladesh. Compared with full-time workers, these seasonal laborers had more psychological distress. In Japan, Reference [15] investigated employees' mental health during the COVID-19 pandemic and found that those work places with a larger number of measures tended to have employees with less fear of and worry associated with COVID-19.

These studies gave some important insights on high risk work conditions waste management workers experienced and had to cope with, we still do not know much about how those workers in developing countries with limited countermeasures against COVID-19 perceive health/safety concerns. This paper, therefore, sheds some new light on waste management workers' health/safety concerns over their daily works during the COVID-19 pandemic in Accra, Ghana.

2. Materials and Methods

2.1. The Study Area

Our study, Accra, is important area to understand waste management workers' conditions in Africa. It is the largest city in Ghana and also one of the largest cities of Africa with an area of 222.67 km². It has a population of about 2,557,000 with a waste generation of 1500 tonnes per day with 0.80 kg per capita [16]. The metropolis is divided into Ablekuma South Sub-Metropolitan District, Ashiedu Keteke Sub-Metropolitan District, Okaikoi South Sub-Metropolitan District, Odododiodio Constituency, Okaikoi South Constituency and Ablekuma South Constituency. There are about 100 waste collectors in each district. In recent years, due largely to rapid urbanization, informal settlement areas expanded with little planning. The most recent record shows that an average per capita waste generation in low-income areas like Okaikoi, Odododiodio and Ashiedu Keteke is about 0.51 kg per day. This amount is lower than that of their high-income areas, which is 0.91 kg, but the accessibility to waste management services is much lower in poor neighborhoods [17].

In Accra, the composition of solid waste differs by sectors. For example, government agencies, hospitals, and schools tend to dispose plastic materials whereas restaurants, hotels, and banks mainly dispose organic waste. The waste generated by the public market consists of organic materials (56.27%), plastics (13.59%), textiles (13.17%), and paper (8.75%) [18].

Some of the impacts Accra residents experienced during the COVID-19 pandemic include limited recovery and relief and food insecurity. Some scholars reported that most workers, especially *kaya bolas*, worked fewer days and earned less after the pandemic. Food prices increase affected these workers with lower payment [19].

In Accra and other major cities of Ghana, *kaya bolas* collected garbage by us-

ing Veronica buckets, which are widely used in Ghana mainly for washing hands. *Kaya bolas* are also expected to use hand sanitizers, face mask/shield, hand gloves and soaps [20].

2.2. Data Collection and Analysis

To get better insights into the safety concerns of waste management workers in the study area during the COVID-19 pandemic, we conducted a questionnaire survey among waste management workers in Accra in March 2021. We requested the Zoomlion Ghana company to allow us to conduct this survey and obtained its approval. We distributed the questionnaire among 60 workers in six districts by using a simple random sampling method and obtained 60 valid responses. Our respondents comprised of collectors, supervisors, and field potters. Collectors collect household waste from waste bins by using tricycles. Supervisors prepare daily schedules for the collectors. Field potters monitor and guide the collection process, and evaluate collectors' performance.

The questions were divided into two parts. The first part attempted to identify the socio-demographic characteristics of the respondents. This included gender, marital status, income, and education. The second part tried to understand safety concerns of the respondents regarding waste collection under the COVID-19 pandemic. The collected responses were coded and entered using Statistical Package for Social Sciences (SPSS version 23) worksheet for analysis.

3. Results and Discussion

3.1. Socio-Demographic Characteristics of the Respondents

Regarding the socio-demographic characteristics of the respondents, we found that the female respondents consisted of 52%. A 2022 World Economic Forum report found a similar gender ratio among 150 plastic waste collectors, in which about 64% was women [21]. Regarding education, we found that all the respondents had some form of education. Among them, 44% had completed tertiary education. About 18% and 38% had completed junior high school education and senior high school education, respectively. Regarding monthly salary, compared to Ghana's monthly minimum wage of Ghc 405, 48% of the respondents received between Ghc1000-2000 per month. About 25% received more than Ghc 2000 (Table 1).

3.2. Respondents' Safety Concerns at Work

In the second part of the survey, respondents' perceptions about COVID-19 safety protocols were assessed. The United Nations Environment Program Report (2020) showed that COVID-19 had a major impact on solid waste management in developing countries [22]. Before the onset of the pandemic, Ghana and many other developing countries had already faced difficulties in managing the growing volume of solid waste without advanced waste treatment facilities and proper personal protection equipment, among others [23]. Considering this

Table 1. Socio-demographic characteristics of the respondents.

Variable	Category	Frequency (Percent)
Gender	Male	29 (48)
	Female	31 (52)
Age	Below 20	0
	20 - 29	18 (30)
	30 - 39	23 (39)
	40 - 49	11 (18)
	50 - 59	6 (10)
	59+	2 (3)
Marital Status	Married	33 (55)
	Single	27 (45)
Level of Education Completed	No Formal Education	0
	Primary	0
	Junior High	11 (18)
	Senior High	23 (38)
	Tertiary	26 (44)
Monthly Income (Ghana Cedis)	Below 500	0
	500 - 1000	13 (22)
	1000 - 2000	29 (48)
	2001 - 3000	7 (12)
	Above 3000	11 (18)

situation, we first asked the respondents whether they were concerned about the on-going pandemic in conducting their works. In response, 58% of the respondents answered yes. For us this result was somewhat surprising as we expected to have a vast majority of the respondents would answer positively. Also, 22% answered no and 20% was not sure. This result suggests a polarized opinion about the impact of the pandemic.

The next question asked the respondents about the availability of the following safety items at work: 1) disinfectants, 2) hand sanitizers, 3) hand gloves, 4) face masks/shield and 5) soap. In response 40% had masks/shields readily available at work, 25% had access to hand sanitizers, and 23% had soap (**Figure 1**). Only a small proportion of the respondents found hand gloves available (3%) availability. Here we found that respondents' perceptions about face mask/shield availability (40%) were similar to their actual usage (40%). Also, their perceptions about hand sanitizer availability (25%) were somehow similar to the actual usage (30%). These results suggest that the availability of safety items was fully utilized by the workers. However, at the same time, having only 20% - 40% with access to safety items means that the respondents had quite limited protection from infection.

Then we attempted to find out how the respondents were practicing

workplace safety protocols. To do this, we asked the respondents how they protected themselves from COVID-19 infection at work by giving them the following options: 1) wear face mask, 2) wash hands frequently using disinfectants and soaps, 3) use Veronica buckets, and 4) wear hand gloves. These options were selected from preliminary interview we did with the Zoomlion company before the questionnaire administration. We found that 40% of the respondents wore face masks/shields at the workplace and 30% used hand sanitizers. Another 27% used Veronica buckets. Veronica buckets were originally developed by a Ghanaian called Veronica Bekoe in 1993 to facilitate efficient hand washing especially in areas where potable water was not readily available [24]. Only 3% mentioned to have used hand gloves (Figure 2). These results imply that regardless of concerns over the pandemic, the respondents were aware of the safety protocols and

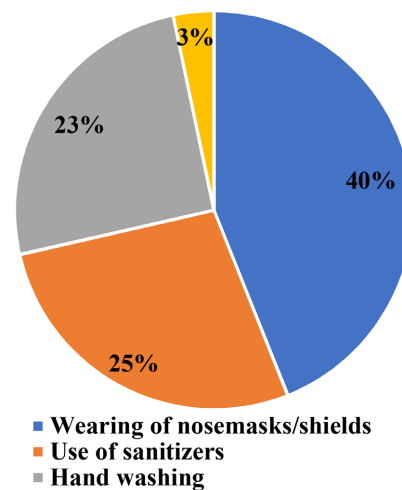


Figure 1. Available safety protocols observed while working.

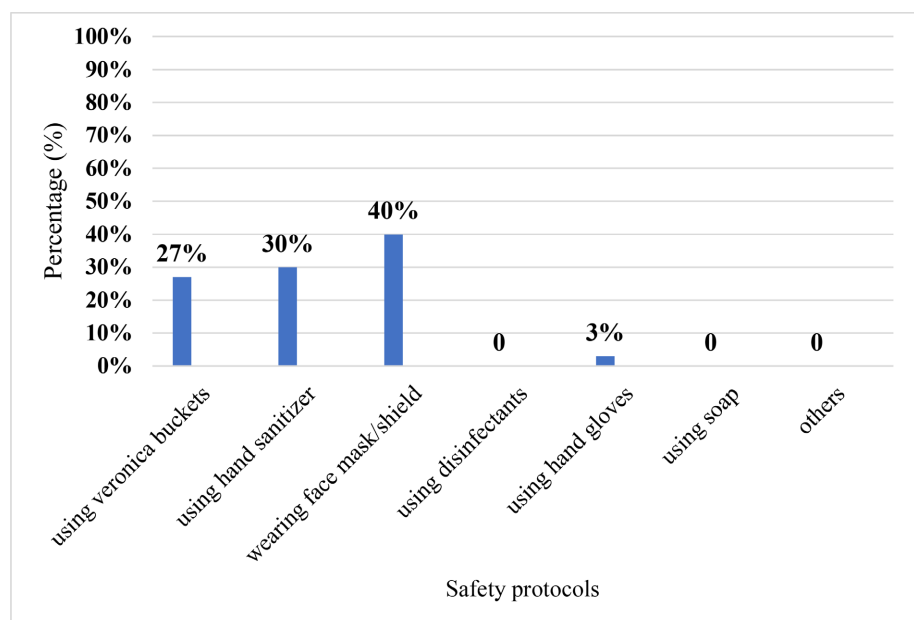


Figure 2. COVID-19 safety protocols practiced among the respondents.

did some kind of preventative actions from contracting COVID-19. As the Zoomlion company did not impose penalties to those who did not respond to the safety protocols, these actions were done somewhat voluntarily. Also, wearing masks has always been part of workers' safety protocols even before the pandemic so that workers did not find it particularly difficult to use face masks [25].

As the use of hand sanitizers was promoted as one of the most important preventive measures, we asked the respondents how often they used hand sanitizers on site each working day. The results showed that all the respondents applied hand sanitizers on site each working day. Interestingly, 54% indicated that they applied hand sanitizer after each collection, 20% 5 - 6 times, 13% 3 - 4 times, and another 13% 1 - 2 times (Figure 3). This result suggests that the respondents somewhat followed COVID-19 safety protocols. However, we also point out here that 46% of the respondents did not sanitize after each collection for some reason. Perhaps this result corresponds with 42% of those respondents who expressed their uncertain feeling about or disagreement with the pandemic impact.

Finally, we asked a question to understand whether the respondents could have a day-off from work due to COVID-19 infection. We found that 43% of the respondents took a day-off once a week. Another 38% had day-off based on job availability. Those who had day-off for multiple days a week consisted of 19%. This result shows that the respondents faced demanding work requirements. Having day-off is often considered as a measures to improve workers' efficiency and productivity. Resting from work also help workers become more attentive to their work safety [26].

4. Conclusion

This paper investigated the safety concerns of waste management workers in Ghana during the COVID-19 pandemic. Our survey found that our respondents were overall better educated than the average Ghanaian people with relatively

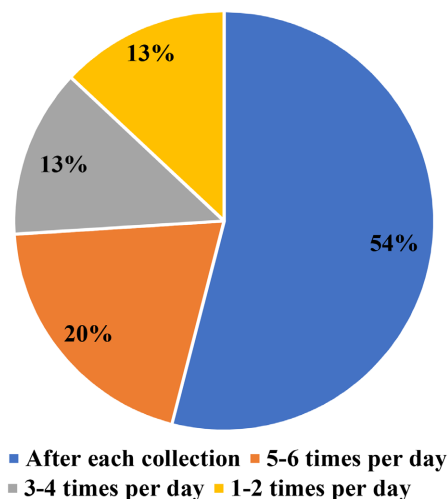


Figure 3. Frequency of hand sanitizer usage by respondents.

higher monthly income levels. These education and income, however, did not appear to explain the polarization of respondents' concerns over COVID-19 risks at work. We found that 58% of them showed concerns over COVID-19 while the rest was either not sure or not concerned. Regarding compliance with safety protocols at work, we found that the respondents had limited protection as only 40% found masks/shields available and used them. Another 25% - 30% found hand sanitizers available and used them. All respondents did use hand sanitizers at work, but only 54% used after each collection. The respondents experienced demanding work conditions. This means that they were exposed to a higher risk of infection and injury. Considering the continuous spread of COVID-19 despite the development of vaccines, these front-line workers need to have more access to protection items and safety education.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Hossain, M.S., Santhanam, A., Norulaini, N.N. and Omar, A.M. (2011) Clinical Solid Waste Management Practices and Its Impact on Human Health and Environment—A Review. *Waste Management*, **31**, 754-766. <https://doi.org/10.1016/j.wasman.2010.11.008>
- [2] Lissah, S.Y., Ayanore, M.A., Krugu, J.K., Aberese-Ako, M. and Ruitter, R.A. (2021) Managing Urban Solid Waste in Ghana: Perspectives and Experiences of Municipal Waste Company Managers and Supervisors in an Urban Municipality. *PLOS ONE*, **16**, e0248392. <https://doi.org/10.1371/journal.pone.0248392>
- [3] Oteng-Ababio, M. (2010) Private Sector Involvement in Solid Waste Management in the Greater Accra Metropolitan Area in Ghana. *Waste Management and Research*, **28**, 322-329. <https://doi.org/10.1177/0734242X09350247>
- [4] World Bank (2019) From Waste to Resource-Shifting Paradigms for Smarter Wastewater Interventions in Latin America and the Caribbean: Background Paper II. Showcasing the River Basin Planning Process through a Concrete Example—The Río Bogotá Cleanup Project. World Bank, Washington DC.
- [5] Akaateba, M.A. and Yakubu, I. (2013) Householders' Satisfaction towards Solid Waste Collection Services of Zoomlion Ghana Ltd in WA, Ghana. *European Scientific Journal*, **9**, 198-213.
- [6] Owusu-Sekyere, E. (2019) Creative Individuals, “Kaya Bola” Exceptionalism and Sustainable Development in Twenty-First Century Ghana. *Journal of Global Entrepreneurship Research*, **9**, Article No. 54. <https://doi.org/10.1186/s40497-019-0177-z>
- [7] Muthelo, D., Owusu-Sekyere, E. and Ogundeji, A.A. (2019) Smallholder Farmers' Adaptation to Drought: Identifying Effective Adaptive Strategies and Measures. *Water*, **11**, Article No. 2069. <https://doi.org/10.3390/w1102069>
- [8] Sivasankaran, P., Mohammed, E.B., Ganesan, N. and Durai, R. (2019) Storage and Safe Disposal of Unwanted and Expired Medicines: A Descriptive Cross-Sectional Survey among Indian Rural Population. *Journal of Young Pharmacists*, **11**, 97-100. <https://doi.org/10.5530/jyp.2019.11.20>
- [9] Shammi, M., Behal, A. and Tareq, S.M. (2021) The Escalating Biomedical Waste

- Management to Control the Environmental Transmission of COVID-19 Pandemic: A Perspective from Two South Asian Countries. *Environmental Science and Technology*, **55**, 4087-4093. <https://doi.org/10.1021/acs.est.0c05117>
- [10] Ofori-Adjei, D., Lartey, M. and Koram, K.A. (2020) Ghana and the COVID-19 Pandemic. *Ghana Medical Journal*, **54**, 1-2. <https://doi.org/10.4314/gmj.v54i4s.1>
- [11] Hartmann, C., Hegel, C. and Boampong, O. (2022) The Forgotten Essential Workers in the Circular Economy? Waste Picker Precarity and Resilience amidst the COVID-19 Pandemic. *Local Environment*, **27**, 1-15. <https://doi.org/10.1080/13549839.2022.2040464>
- [12] Ali, M., Wang, W., Chaudhry, N. and Geng, Y. (2017) Hospital Waste Management in Developing Countries: A Mini Review. *Waste Management and Research*, **35**, 581-592. <https://doi.org/10.1177/0734242X17691344>
- [13] Gutierrez de Almeida, M.D.F., Figueiredo, P.S. and Dantas, J. (2017) The Socioeconomic Conditions of Waste Pickers in Bahia, and an Evaluation of a Workforce Restructuring: A Multiple Case Study. *Environmental and Social Management Journal/Revista de Gestão Social Ambiental*, **11**, 2-20. <https://doi.org/10.24857/rgsa.v11i1.1253>
- [14] Karim, M.R., Islam, M.T. and Talukder, B. (2020) COVID-19's Impacts on Migrant Workers from Bangladesh: In Search of Policy Intervention. *World Development*, **136**, 105-123. <https://doi.org/10.1016/j.worlddev.2020.105123>
- [15] Sasaki, N., Kuroda, R., Tsuno, K. and Kawakami, N. (2020) Workplace Responses to COVID-19 Associated with Mental Health and Work Performance of Employees in Japan. *Journal of Occupational Health*, **62**, e12134. <https://doi.org/10.1002/1348-9585.12134>
- [16] Ghana Statistical Service (2021) GSS Estimated Statistics.
- [17] Akuoko, I.S.G. (2018) Solid Waste Management in Coastal Ghana. University of Rhode Island, Rhode Island.
- [18] Oduro-Appiah, K. and Afful, A. (2020) Sustainable Pathway for Closing Solid Waste Data Gaps: Implications for Modernization Strategies and Resilient Cities in Developing Countries. In: Saleh, H.M., Ed., *Strategies of Sustainable Solid Waste Management*, IntechOpen, London, 1-14. <https://doi.org/10.5772/intechopen.94384>
- [19] Chen, M., Grapsa, E., Ismail, G., Rogan, M. and Valdivia, M. (2021) COVID-19 and Informal Work: Distinct Pathways of Impact and Recovery in 11 Cities around the World. <https://doi.org/10.35188/UNU-WIDER/2022/176-1>
- [20] Bonful, H.A., Addo-Lartey, A., Aheto, J.M., Ganle, J.K., Sarfo, B. and Aryeetey, R. (2020) Limiting Spread of COVID-19 in Ghana: Compliance Audit of Selected Transportation Stations in the Greater Accra Region of Ghana. *PLOS ONE*, **15**, e0238971. <https://doi.org/10.1371/journal.pone.0238971>
- [21] Milios, L., Esmailzadeh Davani, A. and Yu, Y. (2018) Sustainability Impact Assessment of Increased Plastic Recycling and Future Pathways of Plastic Waste Management in Sweden. *Recycling*, **3**, Article No. 33. <https://doi.org/10.3390/recycling3030033>
- [22] Nzeadibe, T.C. and Ejike-Alieji, A.U. (2020) Solid Waste Management during Covid-19 Pandemic: Policy Gaps and Prospects for Inclusive Waste Governance in Nigeria. *Local Environment*, **25**, 527-535. <https://doi.org/10.1080/13549839.2020.1782357>
- [23] Al-Khatib, I.A., Arafat, H.A., Basheer, T., Shawahneh, H., Salahat, A., Eid, J. and

- Ali, W. (2007) Trends and Problems of Solid Waste Management in Developing Countries: A Case Study in Seven Palestinian Districts. *Waste Management*, **27**, 1910-1919. <https://doi.org/10.1016/j.wasman.2006.11.006>
- [24] Oninku, E.A. (2021) The “Veronica Bucket” and the Inventive Step Requirement under the Patent Law of Ghana. *UCC Faculty of Law Journal*, **1**, 395-418. <https://doi.org/10.47963/ucclj.v1i2.425>
- [25] World Health Organization (2020) Mental Health and Psychosocial Considerations during the COVID-19 Outbreak. No. WHO/2019-nCoV/Mental Health/2020.1.
- [26] Ghernaout, D. and Elboughdiri, N. (2021) Plastic Waste Pollution Worsen by the COVID-19 Pandemic: Substitutional Technologies Transforming Plastic Waste to Value Added Products. *Open Access Library Journal*, **8**, 1-12. <https://doi.org/10.4236/oalib.1107622>