

HEALTH COMMUNICATION AND AWARENESS OF ALUMINIUM-WASTE DISPOSAL EFFECTS AMONG OGUN STATE HOUSING CORPORATION RESIDENTS

Toluwalope Oresanya¹, Charity Ben-Enukora², Oladokun Omojola³, Olusola Oyero^{4*} and Lanre Amodu⁵

¹Mr, Covenant University, NIGERIA, tolu.oresanya@stu.cu.edu.ng

²Ms, Covenant University, NIGERIA, ben.nukora@stu.cu.edu.ng

³Ass. Professor, Dr., Covenant University, NIGERIA, ola.omojola@covenantuniversity.edu.ng

⁴Ass. Professor, Dr., Covenant University, NIGERIA, olusola.oyero@covenantuniversity.edu.ng

⁵Dr., Covenant University, NIGERIA, lanre.amodu@covenantuniversity.edu.ng

*Correspondence Author

Abstract

This paper surveyed residents of the Ogun State Housing Corporation who have resorted to collecting aluminium waste as a cheap alternative to assuage the deplorable state of road networks in the estate. 200 copies of the questionnaire were randomly distributed to residents of the Housing Estate. The resolve of the survey was to determine the level of awareness (about the health and environmental implications) of aluminium waste, as well as decipher their level of involvement in the collection, use and contact with these waste materials. In cases of awareness about these health implications; the medium through which they gained such awareness was further queried. It was recommended upon findings that harnessing the participation of all stakeholders (the Residents association, the Industrial wing and the Ogun State government) would bring stability to the growing demand for these materials within the Estate. Similarly, coordinating educative and informative campaigns through the existing meeting platforms in the Estate would expedite enhanced consciousness and eventual cessation of the possibilities of contact and inhalation of aluminium waste in the Housing Estate.

Keywords: Aluminium waste, Awareness, Communication, Public health.

1. INTRODUCTION

The rapid urbanization rate which more often is unplanned and uncontrolled in developing nations have caused changes in the environment, especially as it relates to the management of waste materials generated (Onibokun, 1999; Owoeye & Okojie 2013, p.59). Increased production of waste materials is a by-product of industrialization, overpopulation and chiefly, inadequate funding and training to foster effective waste management systems.

In the view of Owoeye and Okojie (2013, p.59) factories produce waste during manufacturing, mining; also,

agriculture generates leftovers that must be disposed. All of these constitute waste that on a daily basis must be trashed- but where?

Adewole (2009, p.174) points out how studies have revealed households of accounting for about 50% in weight of solid waste generated in many developing countries. For instance, in Lagos state, as cited by Adewole (2009, p.174), the estimated daily generation is about 764 tons in all the 20 Local Government Areas including 37 developing Areas. Similarly, in Ota, Ogun State, Nigeria, indiscriminate waste disposal was a normal practice among the residents (Oyero, Oyesomi, Abioye, Ajiboye, & Kayode-Adededeji, 2015). Pollution, therefore, becomes a major concern caused by indiscriminate disposal of waste which could take several forms, from food remnant to plastic, wood, metal, textile, glass, paper etc.

The presence of over 65 industries, plants and factories in the Ogun State Housing Corporation Estate, Ota which serves both residential and industrial purposes comes a heavy demand on the road network in the estate. This is due to the heavy duty trucks and earthmoving machines plying the roads on a daily basis. This has led to a total degradation of the road and a few other alternative routes in the estate. In a bid to correct this anomaly, some residents have resorted to receiving aluminium waste from factories which is considered to be a cheap alternative to asphalt for correcting the damages made by the heavy demand on the road which has left the road deplorable. The side to all these which is hardly known or considered are the health implications of inhalation or contact with such chemical metal and aluminium waste on a daily basis. Research findings have accentuated that close and continuous contact with such chemical substances could lead to skin cancer and lung cancer (being the fourth highest cause of death globally, accounting for over 1.2 million recorded deaths in 2015 alone) (WHO 2017).

Following the possibility of this health (and long-term environmental) impacts of contact with these waste materials among residents; this paper has these objectives:

1. To determine the awareness level of residents about the negative health/environmental implications of contact, inhalation or ingestion of aluminium waste (fumes and particles).
2. To identify the medium of information through which awareness was obtained.
3. To determine the frequency of information consumption regarding waste management.
4. To proffer solutions to the knowledge gap deficiency about the negative health/environmental implications of aluminium

2. WASTE MANAGEMENT

The management of waste materials embody the process of generation, collection, transportation, processing or disposal of waste materials, usually ones produced by human activity in an effort to reduce their effect on human health and communities (Anchor et.al 2014, p.108). Since dumping of wastes could result in sanitary vulnerabilities as well as nuisance publicly, it befits that strategies be put in place as it suits the environment to deal with the waste in a way that it minimizes the negative health and environmental impact of having such materials around.

The attitude to waste in many parts of the developing world could expedite environmental problems like an offensive stench, aesthetic intrusion and eventually makes the environment a breeding ground for vectors of communicable diseases such as diarrhea and dysentery (FME 2006; WHO 2004; Anchor et.al 2014, p.109).

The inability to identify the hazards that could occur as a result of the chemical component present in industrial waste has encouraged nonchalance in handling industrial waste as aluminium; this ignorance in the end has the ability to cause great danger to health.

For example, dust particles or fumes from aluminium, titanium and magnesium contains Hexavalent chromium- a known carcinogen which can cause lung cancer being the most vulnerable organ next after the fine capillaries in the kidney and intestines. Long term exposure to dust fumes and contact with solid aluminium waste particles could as well accelerate the possibilities of bladder cancer, immunity disorders and neurodegenerative disorders in extreme cases (Simms 2015).

Aluminium/aluminum is a chemical component in the boron group with symbol (Al) and atomic number 13. Aluminium could be silvery-white, soft, non-magnetic and ductile. Aluminium melts at 660.3°C and boils at 2,470°C. Leigh (2010) notes that of all the earth's natural elements, aluminium happens to be the third most abundant resource in our planet in its raw form. Aluminium comprises about 8% of earth soil and rocks (with silicon and oxygen gas making up about 28% and 47% respectively). Aluminium naturally is found only in

chemical compound in company with other elements such as silicon, sulphur and a larger portion of oxygen.

Exposure to aluminium dust may possibly increase the risk of dementia of the Alzheimers type and cardiovascular diseases (Peters et.al 2013). Alzheimers disease is characterized by slow decline in memory, reasoning and thinking ability, a slow progressive disease of the brain that in the end may cause grave disturbances in speech, thinking and reasoning (Howard 2015)].

Similarly, dust particles, if inhaled could aggravate respiratory tract irritations, coughing, respiratory difficulties; it may also result in nausea, vomiting and diarrhoea if ingested. In extreme cases, contact with aluminium waste may result in pulmonary diseases which can trigger asthma symptoms and the Chronic Obstructive Pulmonary Disease (COPD) being third on the list of highest causes of death globally. It claiming 3.2 million recorded deaths in 2015 alone (WHO 2017).

Sustainable waste management would therefore entail the treatment and subsequent disposal of waste in a manner that will not cause any health or environmental hazards to both the present and future inhabitants of the locality (Udoakah & Akpan 2013).

3. METHODS AND MATERIALS

Following the objectives of this research which was to determine the awareness level of residents about the negative health implications of contact, inhalation or ingestion of aluminium waste (fumes and particles), a survey was necessary. Judging by the architectural plan, the Housing Estate has 260 houses under the *Shell housing scheme* and a lot others which were designed and built personally by residents. 200 copies of the questionnaire were purposively distributed to residents within the *Shell housing scheme*. The rationale for this demarcation was that houses within this scheme were closely-knitted and the aluminium waste were concentrated on the roads leading to where these houses were located. It was necessary to focus on these residents as they are more likely to have contact with these materials more often.

4. RESULTS

A. What is the awareness level of residents about the negative health/environmental implications of contact, inhalation or ingestion of aluminium waste (fumes and particles)?

Table I reveals the level of awareness respondents had about the negative health implications of contact, inhalation or ingestion of aluminium waste materials. Far less than one third of the study population are informed about negative the health and environmental implications of these substances. The bulk of respondents (73%) do not possess the knowledge about the negative health implications of these substances.

Table 1: Perception of respondents about negative health impact of aluminium waste

	<i>f</i>	%
I am aware	54	27.0
I am not aware	100	50.0
I can't really say	46	23.0
Total	n=200	100.0

The results from the Table II depicts a rather low level of awareness about the possibilities of developing lung cancer upon inhalation of aluminium waste materials. Over 81% of the study population are not aware that frequent inhalation of aluminium waste could trigger the possibilities of developing lung cancer. On the flip side, less than 20% of the study respondents are aware of the negative implications of breathing in these dust fumes and particles.

Table 2 Awareness about the possibilities of developing lungs cancer

	<i>F</i>	%
Strongly agree	18	9.0
Agree	18	9.0
Undecided	41	20.5
Disagree	90	45.0
Strongly disagree	33	16.5
Total	n-200	100.0

Table 3 presents the level of awareness about the possibilities of developing skin cancer as a result of long term contact of the skin with aluminium dust particles and fumes. The results indicate that a little less than 19% of the study population are aware of the negative impacts of contact with these waste materials. On further observation of the results, 60% of respondents are not aware of the negative health implications

Table 3 Awareness about the possibilities of developing skin cancer

	<i>f</i>	%
Strongly agree	27	13.5
Agree	9	4.5
Undecided	44	22.0
Disagree	67	33.5
Strongly disagreed	53	26.5
Total	n=200	100.0

Table 4 reveals that only 15% of the study population are aware of the negative health implication of ingesting these materials. Like it is often observed of those who deal with these waste materials, a few of them are found having their meal while sitting on these waste materials. Contrarily, 63% of the population are not aware and a little above 20% are undecided.

Table 4- Awareness about the possibilities of developing bladder infections

	<i>f</i>	%
Strongly agree	9	4.5
Agree	18	9.0
Undecided	47	23.5
Disagree	66	33.0
Strongly disagree	60	30.0
Total	n=200	100.0

B. How was the knowledge about the negative health/environmental implications of aluminium waste obtained?

Bearing in mind that a larger percentage of the study population (73%) are not aware of the negative health and environmental implications of these waste materials. The little fraction of the population that was aware of the negative health implications of these were queried on how they gained such knowledge. A fraction said they gained knowledge through the television (6.6%), 19.9% obtained this knowledge in a printed publication they had come in contact with, a larger percentage of the study population either experienced the initial symptoms of these health implications (36%) or were told by a close friend (37.5%).

The implications of these are that a larger percentage of the study population who had gained knowledge of the health and environmental implications of aluminium waste did so through word of mouth and not through the mass media.

On a further probe, respondents were asked if they had come across any advert on the media, informative and social debates program or phone-in programs on radio that addressed the issue of aluminium waste. To this question, only 19% responded in the affirmative, the 81% left denied having come across any of such information through adverts, social debate programs or phone-in.

C. How frequently are respondents exposed to information regarding the negative health/environmental implications of aluminium waste?

In determining how frequent respondents were exposed to information regarding the negative health implications of these scrap metals, the results indicate that only 9% of the population had contact with such information at least once a week, 21% had access to such information only once in a while. A larger percent of the population (70%) had never at any time come in contact with such information. In a different set of questions, 94.5% of the study population had never seen or heard any public service announcements on television or radio which emphasized the negative impact of these materials on their health and by extension, the environment.

5. CONCLUSION

There is an existing knowledge gap on the negative health (and in the long run, environmental) impacts of contact with aluminium dust particle, fumes and scrap waste. This exiting knowledge gap forms a warrant upon which communication approach would be taken to sensitize with the aid of diagrams, charts and teaching aid the need to abstain and totally seek an alternative to the use of aluminium scrap materials as cheap alternative to asphalt and tar in road and land filling. Research findings have linked some health conditions as pulmonary infections, Alzheimers disease and chronic cases of lung, bladder and intestinal diseases coupled with asthmatic symptoms have been linked with inhalation, ingestion and contact with these waste materials in the past.

Upon presentation and inclusion in the public dialogue of members of the Housing Estate, it is expected that a new attitude be formed towards the collection and spread of aluminium waste cheap alternative to land filling in the area

6. RECOMMENDATIONS

Based on the findings of these paper, the following are recommended:

1. Massive awareness drive to sensitize occupants on the Housing Estate of the negative health (and long term environmental) impact of contact with Aluminium dust particles, fume and waste materials. It will be necessary to use the people's indigenous language so that the communication will be effective as suggested by Oyero (2007: 234).

2. There is a need to begin with a mini-awareness scheme for the leaders and executive members of the associations- this is in tandem with the Two-step flow theory which advocates information from the media flow in two stages. These executives are the influential members of the Association; therefore having them see a reason for a change would make the social change process successful.

3. There is a dire need to draft a communication message and approach as discussed in the preceding section of this paper to enlighten the residents through based on training already provided to the volunteers on the health implications of these substances.

4. Moemeka (2000) identifies the *interpersonal strategy* to be the oldest strategy to generate social change or development. The main thrust of this strategy is disseminating information with the aim of **instigating dialogue** and bringing the attention of targets to an idea they may have not noticed or paid close attention to. The idea behind this is that with dialogue, and continuous one at that, the citizenry base will begin seeing reasons why the new idea should be adopted, after considering its benefits and the stand point of being relatively advantageous to what is currently operational.

It is expected that an issue as the detrimental impact of aluminium waste would gain attention for continuous dialogue and would thereafter become an issue of public discourse among residents within the estate. As the Ota Branch Manager, Ogun Housing Estate Corporation mentioned in the interview; ***Over 55% of residents in the estate have these aluminium waste in front of their houses***. This issue affects a large number of the residents of this estate and as such, should get sufficient hearing in the forthcoming meetings

5. With direct application with the need to sensitize residents of the Housing Estate through dialogue on the need to avoid and totally seek an alternative to aluminium waste, the platform of the monthly Residents Association platforms would be utilized. With the aid of charts, diagrams and teaching aids, a brief and in-depth informative lecture could be accomplished to describe the health hazards of contact with these waste materials. Also with **emphasis on the nonexistence of cure to contact** with these substances aside total abstinence from it, the attitude to these waste materials would henceforth be changed.

Furthermore, thirty volunteers from the first briefing meeting would be trained and armed with the prerequisite information about the health implication of contact with these materials; these trained hands would be drafted into teams of threes who would do **a door-to-door awareness campaign** on Friday evenings and Saturday mornings; this is to continue for only two months (6 weeks of publicity preceding to a two-session training), this is after the first training session at the general meeting.

This initiative would achieve two main purposes, **first to reinforce the new opinions** about these materials and **secondly, to cover for the few residents who may have been absent** in the first briefing meetings/forum.

In addition, the choice of residents to be on the volunteer team and not outsiders is due to the peculiar nature of the estate where virtually everyone is behind tall fences and security conscious. However, **access is guaranteed more when the volunteers are known faces**. With this interpersonal approach, the knowledge passed during the briefing is reinforced on the hand, and on the other becomes part of public discourse within the estate.

4. ACKNOWLEDGEMENT

This study is sponsored by the Covenant University Centre for Research, Innovation and Development (CUCRID), Covenant University, Ota- Nigeria.

REFERENCE LIST

- Adewole, A.T. (2009). Waste management towards sustainable development in Nigeria: A case study of Lagos state. *International NGO Journal* Vol. 4 (4), pp. 173-179
- Anchor, P.N., Ehikwe, A.A. & Nwafor, A.U. (2014). Curbing/Mitigating indiscriminate waste dumping through effective stakeholder relations. *International Journal of Science and Research*, Vol. 3(4), Pp.107-117
- Federal Ministry of Environment (2006) Environmental Policy Document: Response to Sanitation, Climate change and other related problem. Document submitted to United Nations Environmental Protection Agency, Abuja.
- Howard, C. (2015). Alzheimers disease. Accessed on June 23 2016 from www.medicinenet.com/a:zeheimers_disease_causes_stages_and_symptoms/articles.htm
- Leigh, E. (2010). What Aluminium extraction really does to the environment? *Recycle Nation*. November 9, 2010. Retrieved June 23 2016 from www.recyclenation.com/2010/11/aluminium-extraction-recycling-environment.html
- Moemeka, A.A. (2000). *Development Communication in Action*. Maryland: University Press of America.
- Onibokun AG (1999). Managing the monster: urban waste and Governance in Africa. International Development Research Centre IDRC Books [serial on internet]; Available from: http://www.idrc.ca/en/ev-9402-201-1-DO_TOPIC.html
- Owoeye, I. O. & Okojie O. H. (2013). Environmental audit of a refuse dump site in the Niger Delta Region of Nigeria *Journal of Public Health and Epidemiology* Vol. 5(2), pp. 59-65, February 2013 Accessed on June 17, 2016 from <http://www.academicjournals.org/JPHE>
- Oyero, O. S. (2007). Dynamics of indigenous language in environmental communication. *Lagos Papers in English Studies*. Vol. 1(1): 228-235.
- Oyero, S., Oyesomi, K., Abioye, T., Ajiboye, E. & Kayode-Adedeji, T. (2015). Behavioural Practices and Climate Change Awareness in Ota, Ogun State, Nigeria: Implications for Communication and

Development Agenda. In Daramola, O. & Iweala, E. (Eds.). *Proceedings on International Conference on African Development Issues* (CU-ICADI) (pp.359-364), Ota, Nigeria: Covenant University Press.

Peters, S., Reid, A., Fritschi, L., de Klerk, N. & Musk, A.W. (2013). Long term effects of Aluminium dust inhalation. *Occupational and Environmental Medicine*, Vol.70 (12), Pp.864-868

Simms, A. (2015). Waste materials: is it hazardous to breathe second-hand aluminium or stainless steel dust on a daily basis? *Quora*: Access on June 23 2016 from www.quora.com/Waste-materials-is-is-hazardous-to-breathe-secondhand-aluminium-or-stainless-steel-dust-on-a-daily-basis

Udoakah, Y. & Akpan, U. (2013). A Sustainable Approach to Municipal Solid Waste Management in Southern Nigeria. *Paper* presented at the Institute of Electrical Electronics Engineers (IEEE) Global Humanitarian Technology Conference (GHTC) October 20 - 23, 2013, Silicon Valley - San Jose, California, USA.

WHO (2004) *Developing Nations, State of Environment and Access to portable Drinking Water*. New York, August 2004.

World Health Organisation. The top ten causes of death worldwide. WHO Media Centre; 2017. Retrieved from www.who.int/mediacentre/factsheet/fs310/en/