



## Evaluation of Demographic Variables and Socio-economic Status on the Prevalence of Health Hazards amongst Residents of Akure North Local Government, Ondo State, Nigeria

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**ABSTRACT:** This study evaluated the demographic variables and socio-economic status on the prevalence of health hazards amongst residents of Akure North Local Government, Ondo State, Nigeria. The study was a descriptive research design of the survey type. The population for this study was estimated to be 131,587 residents. The sample consisted of 600 residents using stratified sampling technique. Pearson Product Moment Correlation and multiple regression analysis were used for the analysis and were tested at 0.05 level of significance. The findings on the disposal of solid wastes by the residents showed that there was a significant relationship between household solid wastes disposal and health hazards among residents of Akure North Local Government Area ( $r=-0.876$ ,  $p<0.05$ ). Also, all the demographic variables jointly influence the prevalence of health hazards, ( $F= 7.332$ ,  $p<0.05$ ) while socio economic status had no influence on the prevalence of health hazards among residents of Akure North Local Government. Therefore, there is the need to enhance environmental education programmes and public participation as it affects solid wastes management not only through the radio, television and print media but also through grassroots enlightenment campaigns via the chiefs and community leaders. Also, the women should be more empowered economically and be made to play an important role as it has been realized that women do a greater part of solid wastes handling and disposal in the community. ©JASEM

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Solid Waste Management refers to an integrated approach of controlling the generation, as well as managing the storage, collection, transfer and transport, processing and disposal of solid wastes in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics and other environmental considerations, which is responsive to public needs (Government –wide audit report on solid waste 2002). Oreyomi (1998) described solid waste management as the storage, collection, transportation, treatment and disposal of waste in such a way as to render them innocuous to human and animal life, ecology and the environment generally. The goals of municipal solid waste management are to promote the quality of the environment, generate employment and income, and protect environmental health and support the efficiency and productivity of the economy. In a study, Navez-Bouchaire (1993), found out that the management of household solid waste is tied to perceptions and socio-cultural practices which result in modes of appropriation of space which are greatly

differenced according to whether the space is private or public.

Nigeria, having a population of 120 million (Sridhar and Adeoye, 2003), generated 0.58Kg solid waste per person per day, and in some Nigerian cities as follows: Abeokuta in Ogun state (0.60Kg/person/day), Ado-Ekiti in Ekiti state (0.71Kg/person/day), Akure in Ondo state (0.54Kg/person /day), Ile-Ife in Osun state (0.46Kg/person/day) and Ibadan in Oyo state (0.71Kg/person/day) as at the year 2005 (Adewumi *et al.*, 2005). Ondo state, being one of the oldest states in Nigeria, has witnessed increase in population, urbanization, industrialization and economic growth. The rapid growth has resulted in increased consumption of resources to meet the growing demands of the population, and this situation leads to the generation of large amounts of wastes in the state.

Conditions created by improper household solid wastes management provide food and harbourage for rodents, mosquitoes and other vermins which are responsible for

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transmission of diseases. The more important diseases in this category are malaria, diarrhoea and lassa fever. Ondo state recorded 2 deaths out of 31 suspected cases from the recent outbreak of lassa fever in Nigeria. (Premium times, January 15, 2016). From observation, Akure North Local Government is faced with household solid wastes management problems and the areas of problems are indiscriminate dumping, inefficient collection methods, improper storage, lack of fitting disposal sites, poor enlightenment of the people about solid wastes management, troubles with proper solid wastes management due to deterioration of road ways and also the prevalence of some health hazards especially malaria fever which could be attributed to improper management of household solid wastes within the Local Government Area. Available data from Akure North Local Government health facility between the years 2011 to 2014, showed an average of 5,705 reported cases of malaria, while 10,787 malaria cases were reported in 2015. Therefore, it is expedient to look at the implication of the demographic variables and socio-economic status on the prevalence of health hazards amongst residents of Akure North Local Government, Ondo State, Nigeria.

## **MATERIALS AND METHODS**

A self - designed questionnaire tagged 'Effects of Household Solid Wastes Management and Health Hazards' (EHSWMHHQ) was used to elicit information from the respondents. The instrument consisted of three sections identified as section A, B, and C. Section A contained information on demographic characteristics of the respondents such as age, gender, educational background, location of residence and socio economic status. The respondents tick from the options provided. The items in section B were used to elicit information on storage, disposal and collection of solid wastes from the respondents. Yes or No response was used. Section C of the instrument was designed to elicit information on the health hazards experienced by the respondents as a result of improper solid waste management. Yes or No response was also used. The questionnaires were administered to 600 respondents in their residence. Four research assistants were employed to assist in the administration of the instrument. The research assistants were trained on subject matter as well as modalities and the procedures to follow in the administration of the instrument. The purpose of the study was explained to the respondents and they were given sufficient time to answer the questions. The researcher and the research assistants administered the instrument to the respondents. Finally, out of the 600

copies of questionnaire, 580 copies of questionnaire were collected and collated giving 96.7 percent return rate.

The population in this research were the residents of Akure North Local Government with an estimate number of 131,587, comprising 66,878, males and 64,709 females (2006 population). Male and female residents of six communities namely Oba ile, Iju, Itaogbolu, Ilu abo, Ogbese, Bolorunduro were used for the study. The sample consisted of 600 residents of Akure North Local Government area of Ondo State. Six communities were selected within the Local Government using simple random sampling technique. Stratified random sampling technique was used to select 150 respondents each in Iju, Itaogbolu and Oba Ile and 50 respondents were selected each in Bolorunduro, Ogbese and Ilu Abo. In order to determine the effects of the dumpsite it was crucial to have two strata of the residents near dumpsite and those residents far from the dump site. This method ensured that there was no biasness in the selection of the population who were part of the sample.

*Data Analysis:* The general questions were answered with the descriptive statistics using frequency counts and percentages. The hypotheses were tested using Pearson Product Moment Correlation and multiple regression analysis and were tested at 0.05 level of significance.

## **RESULTS AND DISCUSSION**

Majority of the residents under investigation identified themselves with one form of storage container or the other. Findings revealed that polythene bags, sack and communal bins provided by the government were the major containers for storage of solid wastes by the residents (Table 1). This finding is consistent with the study of Laryea, (1997) who discovered that many households in Accra store their waste in open containers ranging from baskets to plastic bags, making home storage unhygienic. The similarity of the findings of unhygienic means of storage of solid waste might be due to the fact that durable storage containers with tight fitting cover are not affordable and easily available to the residents of Akure North Local Government.

The findings on the disposal of household solid wastes by the residents showed that the use of waste management facilities and services and dumping at the site designated by local Government authority were the common practice among residents of Akure North

Local Government Area as presented in table 2. However, findings showed that majority dumped their solid waste inside the public drainage. This finding is in line with Briscoe (1993) discovery that the poor dispose of their waste at communal collection containers, into surface drains, in open spaces, and in water bodies. Some residents burn their solid waste, while others indiscriminately bury it. Kjellen, (2001) discovered that, many of the households disposed of their waste at communal dump sites, on the streets, in the gutters and other waterways and drains. This might be due to inadequate access to solid waste disposal facilities and services to residents in rural areas and also lack of awareness campaign of the health effects associated with indiscriminate disposal of solid waste.

Table 3 revealed frequency counts and percentages of the authorities responsible for collection of solid wastes. As shown in Table 3, 480 (82.8%) of the total sample reported that the state owned waste management authority was responsible for collection of solid waste in Akure North Local Government. Other authorities saddled with the responsibility of solid waste collection in Akure North Local Government are; Local Government Authority 471 (81.2%), private collectors 142 (24.5%), community labour 374 (64.5%), individual household 385 (66.4%), 412 (71%) of the respondents indicated the availability of collection services in their community, 459 (79.1%) reported that solid waste are collected weekly, 475 (81.9%) rated the collection services as being efficient, 478 (82.4%) agreed that collection vehicles move from house to house while 481 ( 82.9%) of the residents are willing to pay for solid waste collection services. The discovery of Ogwueleka (2009) that the solid wastes collection efficiency in Nigeria ranged from 5 percent in some semi-urban areas to 50 percent in urban areas disagrees with the findings of this study because majority indicated that collection services were efficient in their community. The reason for the difference in the findings may not be unconnected with the increasing efforts of the authorities to sanitize the communities. Issues of attitudes and perceptions appear to affect the residence as evidenced by the heaps of refuse observed.

Findings on health hazards associated with household solid wastes showed that water contamination, food contamination, offensive odour , flooding due to blockage of gutters and malaria were rated very high among others. This finding corroborate with the discovery of Kjellen (2001), that waste may eventually get washed away by rainwater to contaminate water bodies or block drainage channels. He further stressed

that over 70 percent of household solid waste generated in Accra is organic matter, which, under prevailing high tropical temperatures, decomposes rapidly and produces bad odours. Decomposing organic waste, when improperly stored in open containers for long periods, becomes detrimental to health because it increases the breeding of disease-carrying vectors like rodents and insects. He found out that, the storage of organic waste in open containers also attracts houseflies to the household kitchen. Houseflies are vectors for various infectious diseases and transmit diseases through food contamination either by direct contact with food or through their droppings.

Furthermore, Table 4 showed frequency counts and percentages of the health hazards associated with household solid waste management with a high percentage of the respondents experienced flooding due to blockage of gutters 466 (80.3%) and low percentage in cholera infection 110 (19%), 456 (78.6%) experienced accidental fire outbreak from burning of solid waste, other hazards are dysentery 434 (74.8%), flies infestation 460 (79.3%), rodent infestation 453 (78.1%), offensive odour 473 (81.6%), food contamination 488 (84.1%), very high percentage of the respondent claimed to have experienced water contamination 509 (87.8%) and 477 (82.2%) experienced malaria. This corresponds with the finding of Ogwueleka (2009), that the dangers of indiscriminate dumping of refuse include, health hazard to scavengers at the dump site, pollution of ground water, spread of infectious diseases, highly toxic smoke from continuously smouldering fires and foul odours from decomposing refuse. Also, Folorunso and Awosika (2001) related flooding in Lagos to clogging of drainage channels by dumped solid wastes. The health hazards prevalent in Akure North Local Government might be as a result of indiscriminate disposal of solid waste as well as poor personal hygiene. This study indicated a significant relationship between household solid wastes storage and health hazards. This denotes that the containers used to store solid wastes can encourage health hazards. This findings also agreed with Laryea, (1997), that the storage of organic wastes in open containers attract houseflies to the household kitchen which are vectors for various infectious diseases and transmit diseases through food contamination either by direct contact with food or through their droppings. Furthermore, this study found out that there was a significant negative relationship between household solid wastes disposal and health hazards. This denotes that the more waste is being disposed properly the less the prevalence of health

hazards associated with solid wastes management. This finding is consistent with the report of UNEPA (2006) which stated that wastes that are not properly disposed, especially excreta and solid wastes from households and the community, are a serious health hazard and could lead to the spreading of diseases. The report further stated that unattended wastes lying around attract flies, rats, and other creatures that, in turn, spread diseases. The test of the relationship between household solid wastes collection and health hazards had a moderately high positive relationship. This denotes that there is a close relationship between collection of household solid wastes and health hazards. Inadequate collection facilities and services will lead to increase in health hazards that will be experienced by the residents. Surjadi, (1993), in a similar study of household-level environmental problems in Jakarta found a correlation between uncollected garbage and the occurrence of respiratory diseases in mothers and children, probably because households with no collection services burned garbage.

Scores on demographic variables (age, gender, educational background and location of residence), socio economic status and prevalence of health hazards among residents of Akure North Local Government were subjected to statistical analysis involving Multiple Regression at 0.05 level of significance showed that all the demographic variables of residents jointly influence the prevalence of health hazards (F= 7.332, p<0.05). Therefore, the demographic variables influenced the prevalence of health hazards among residents of Akure North Local Government (r-calculated=0.245, p<0.05; r-table=0.195) (Table 5). The result in table 6 showed a significant relationship between household solid wastes

disposal and health hazards (r=-0.876, p<0.05) which is a pointer to the problem of waste management among residents of the tested community. Considering all these variables, demographic factors jointly influence the prevalence of health hazards among the residents of Akure North Local Government while socio economic status of residence had no significant influence on the prevalence of health hazards associated with household solid wastes management among residents of Akure North Local Government which is in agreement with Babayemi and Dauda (2009), who reported that, age, gender, cost of waste collection services among others, were factors influencing solid waste management in Abeokuta.

**Conclusion:** Based on the findings of this study, it can be therefore concluded that demographic and socio economic factors may be an influence on the management of household solid waste. Proper management of household solid wastes will result in the reduction of health hazards. Many of the households disposed of their waste at communal dump sites, on the streets, in the gutters and other waterways and drains. This is worrisome as the communal dump sites encourage proliferation of houseflies, mosquitoes, rats and other vermin and aid in the spread of infectious diseases with a serious public health concern. In addition, they give off bad smells and generally constitute a nuisance to the environment. Improving access to safe disposal facilities, in addition to conducting awareness campaigns on the health impacts of poor sanitation, will help alleviate the problems of improper solid wastes management and eventually improve the quality of the environment.

**Table 1:** Frequency counts and percentage of storage of solid wastes by residents of Akure North Local Government Area

| S/N | ITEMS  | YES |      | NO  |      |
|-----|--|-----|------|-----|------|
|     |  | N   | %    | N   | %    |
| 1.  | Use of polythene bag   | 452 | 77.9 | 128 | 22.1 |
| 2.  | Use of dustbin with lid  | 383 | 66.0 | 197 | 34.0 |
| 3.  | Use of dustbin without lid   | 344 | 59.3 | 236 | 40.7 |
| 4.  | Use of plastic bucket  | 364 | 62.8 | 216 | 37.2 |
| 5.  | Use of sack  | 452 | 77.9 | 128 | 22.1 |
| 6.  | Use of communal bin provided by the government   | 472 | 81.4 | 108 | 18.6 |
| 7.  | I store more than 2 days in the house  | 388 | 66.9 | 192 | 33.1 |
| 8.  | I empty my storage bin within my surrounding   | 396 | 68.3 | 184 | 31.7 |
| 9.  | My storage bin is emptied into designated solid waste depot within my community                | 406 | 70.0 | 174 | 30.0 |
| 10. | My storage bin is kept out of the reach of domestic animals to prevent spillage of solid waste | 431 | 74.3 | 149 | 25.7 |
| 11. | I have storage container for solid waste   | 454 | 78.3 | 126 | 21.7 |

**Table 2:** Frequency counts and percentages of solid wastes disposal among residents of Akure North Local Government Area

| S/N | ITEMS  | YES |      | NO  |      |
|-----|--|-----|------|-----|------|
|     |  | N   | %    | N   | %    |
| 1.  | The use of waste management facilities and services              | 452 | 77.9 | 128 | 22.1 |
| 2.  | By burning   | 390 | 67.2 | 190 | 32.8 |
| 3.  | Dumping inside the pit at the backyard                           | 391 | 67.4 | 189 | 32.8 |
| 4.  | Dumping in nearby bushes   | 388 | 66.9 | 192 | 33.1 |
| 5.  | Dumping inside public drainage                                   | 407 | 70.2 | 173 | 29.8 |
| 6.  | Dumping at the site designated by the Local Government Authority | 450 | 77.6 | 130 | 22.4 |
| 7.  | I make use of stream or rain to dispose my solid waste           | 434 | 74.8 | 146 | 25.2 |

**Table 3:** Frequency counts and percentages of the authorities responsible for collection of solid wastes

| S/N | ITEMS   | YES |      | NO  |      |
|-----|---|-----|------|-----|------|
|     |   | N   | %    | N   | %    |
| 1.  | Ondo state waste management authority                   | 480 | 82.8 | 100 | 17.2 |
| 2.  | Local Government Authority                              | 471 | 81.2 | 109 | 18.8 |
| 3.  | Private collectors                                      | 142 | 24.5 | 438 | 75.5 |
| 4.  | Community labour  | 374 | 64.5 | 206 | 35.5 |
| 5.  | Individual household                                    | 385 | 66.4 | 195 | 33.5 |
| 6.  | Collection services are available in my community       | 475 | 81.9 | 105 | 18.1 |
| 7.  | Solid waste are collected weekly                        | 459 | 79.1 | 121 | 20.9 |
| 8.  | Collection services are efficient in my community       | 475 | 81.9 | 105 | 18.1 |
| 9.  | Collection vehicles move from house to house            | 478 | 82.4 | 102 | 17.6 |
| 10. | I am willing to pay for solid waste collection services | 481 | 82.9 | 99  | 17.1 |

**Table 4:** Frequency counts and percentages of the health hazards associated with household solid waste management.

| S/N | ITEMS  | YES |      | NO  |      |
|-----|--|-----|------|-----|------|
|     |  | N   | %    | N   | %    |
| 1.  | Flooding due to blockage of gutters                  | 466 | 80.3 | 114 | 19.7 |
| 2.  | Cholera infection                                    | 110 | 19.0 | 470 | 81.0 |
| 3.  | Accidental fire outbreak from burning of solid waste | 456 | 78.6 | 124 | 21.4 |
| 4.  | Diarrhoea  | 434 | 74.8 | 146 | 25.2 |
| 5.  | Flies infestation                                    | 460 | 79.3 | 120 | 20.7 |
| 6.  | Rodent infestation                                   | 453 | 78.1 | 127 | 21.9 |
| 7.  | Offensive odour                                      | 473 | 81.6 | 107 | 18.4 |
| 8.  | Food contamination                                   | 488 | 84.1 | 92  | 15.9 |
| 9.  | Water contamination                                  | 509 | 87.8 | 71  | 12.2 |
| 10. | Malaria fever  | 477 | 82.2 | 103 | 17.8 |

**Table 5:** Multiple Regression analysis of demographic factors and prevalence of health hazards among residents of Akure North Local Government

| Model                  | B      | Std. error | Beta  | T      | Sig. T | R    | R <sup>2</sup> | F     |
|------------------------|--------|------------|-------|--------|--------|------|----------------|-------|
| Constant               | 17.765 | .563       |       | 31.565 | .000   |      |                |       |
| Age                    | .327   | .154       | .095  | 2.126  | .034   |      |                |       |
| Gender                 | -.502  | .167       | -.144 | -3.014 | .003   |      |                |       |
| Socioeconomic status   | -.179  | .127       | -.079 | -1.418 | .157   |      |                |       |
| Educational background | .461   | .099       | .202  | 4.650  | .000   | .245 | .060           | 7.332 |
| Location of residence  | -.058  | .175       | -.016 | -.332  | .740   |      |                |       |

**Table 6:** Pearson Moment Correlation Analysis of household solid wastes disposal and health hazards

| Variable              | N   | Mean  | SD   | r-cal   | r-table |
|-----------------------|-----|-------|------|---------|---------|
| Solid wastes disposal | 580 | 12.02 | 1.76 |         |         |
| Health hazards        | 580 | 18.08 | 1.72 | -0.876* | 0.195   |

## REFERENCES

- Adewumi, IK., Ogedengbe, MO., Adepetu, JA., Fabiyi, YL. (2005). Planning organic fertilizer industries for municipal solid wastes management. *J. Appl. Sci. Res.* 1(3): 285-291.
- Babayemi, JO., Dauda, KT. (2009). Evaluation of Solid Waste Generation, Categories and Disposal Options in Developing Countries: A Case Study of Nigeria. *J. Appl. Sci. and Environ. Manage.* 13(3): 83-88.
- Briscoe, J. (1993). When the cup is half full: Improving water and sanitation services in the developing world. *Environ.* 35(4), 7-15, 28-37.
- Folorunso, R., Awosika, L. (2001). Flood mitigation in Lagos, Nigeria through the wise management of solid waste: the case of Ikoyi and Victoria Islands. Report of a workshop on Wise practices for coastal conflict prevention and resolution, Maputo, Mozambique.
- Government –wide audit report on solid waste (2002). Government-wide Performance Audit Report on Solid Waste Collection System of the City of Manila.
- Kjellen, M. (2001). Health and environment. Stockholm: Swedish International Development Cooperation Agency: Sida.
- Laryea, JA. (1997). Urban waste management techniques: The case of Ghana. In. E.K. Boon & L. Hens (Eds.), Environmental management in West Africa.
- Navez-Bouchaive, F. (1993). Cleanliness and the appropriation of space, refuse and living habits in large Moroccan towns. People's Mediterranean, Morocco.
- Ogwueleka TC. (2009). Municipal Solid Waste Characteristics and Management in Nigeria. *Iran J. Environ. Health Sci. Engineering.* 6(3): 173-180.
- Ondo State of Nigeria, (1999). An act for the establishment of the Ondo State Waste Management Authority, (ODSWMA). No. 3.
- Oreyomi, MK. (1998). Selected Topics on Environmental Health (1st Ed.) Lagos: Kinson press. Premium Times (2016). Lassa fever: Ondo records 2 deaths, 31 quarantined. January 15, 2016.
- Sridhar, MKC, Adeoye, GO. (2003). Organo-mineral fertilizer from urban wastes: development in Nigeria. *The Nigerian Field.* 68: 91-111.
- Surjadi, C. (1993). Respiratory diseases of mothers and children and environmental factors among households in Jakarta. *Environment and Urbanization*, 5(2),78-86.
- United Nations Environment Program (UNEP), (2006). Informal Solid Waste Management. <http://www.unep.org>.