

# REFUSE DISPOSAL AND ITS ATTENDANT HEALTH HAZARDS: A CASE STUDY OF AGBOR, DELTA STATE OF NIGERIA

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## ABSTRACT

The problem of solid waste (refuse) disposal and its attendant health hazards in Ika south local government area (Agbor) of Delta state, Nigeria is reported. Questionnaire was the data collection instrument used. The questionnaire focused on the effect of untreated refuse dumps on the health of the people, the success recorded so far with our present day refuse disposal methods and the level of the problem of refuse disposal within the locality. In all, two hundred questionnaires were distributed. Respondent's frequency was analyzed using the student t-test at 0.05 level of significance. 1350 respondents, representing a mean value of 135.0 of the total respondent frequency of 2000, agreed that improper dumping of refuse constitutes a health hazard, while 650 respondents (mean value of 65.0) disagreed, indicating a significant difference between the respondents at 0.05 level of probability. 1100 respondents (mean value of 110.0) also agreed that our present day refuse disposal methods have failed us while 900 (mean value of 90.0) disagreed. Again 1432 respondents believe that the problem of poor refuse disposal has reached an alarming rate while 568 respondents believe otherwise. This paper therefore proposes more effective and better funded solid waste management, and enlightenment campaigns mounted by the statutory council authority to sensitize the people on safe health practices.

**KEY WORDS:** Disposal, Health Hazards, Management, Solid Waste, Refuse

## INTRODUCTION

Man must essentially generate waste. It follows therefore that regardless of the social and economic status, mankind must produce wastes of various forms such as gases, liquids and solids (Adedibo, 2008). Gaseous and liquid wastes arise from industrial wastes such as polluted water and carbon (II) oxide as a by-product of diesel oil used in industries as alternative for generation of electricity. Solid waste which is one of the sources and causes of environmental pollution has been defined under Resource Conservation and Recovery Act (RCRA), 2002 as any solid, semi-solid, liquid or contained gaseous materials discarded from industrial, commercial, mining, medical, agricultural and domestic activities. Solid wastes also include garbage, construction debris, commercial refuse, sludge from water or wastewater treatment plants, or any

management refers to the collection, transfer, treatment, recycling, resource recovery and disposal of solid waste generated in urban areas (Holloway, 1995). The essence of waste management is to maintain acceptable environmental quality, sound public health, and creation of aesthetic value. Health impact of solid waste in the environment includes exposure to toxic chemicals through air, water and soil media besides exposure to infection and biological contaminants stress-related odour, noise, vermin and visual amenity, risks of fire, explosion, and subsidence (Dolk, 2002). The World Health Organization (WHO) defined health as a state of complete physical, mental and social well-being and not merely the absence of disease. Hence, a person exposed to filth may not be sick outright but his well-being may be compromised. Inadequate and inappropriate sanitation and poor

(Adelagan, 2001). Several studies carried out in Nigeria, India and Egypt indicate the presence of health problems amongst solid waste pickers and those living in close proximity to dump sites (Ekugo, 1998; Oyemade et al., 1999; Sridhar, 2006). There is a direct link between poor urban solid waste management and public health, especially in terms of water-related diseases such as, dysentery, cholera and typhoid (Adelagan, 2001). In most developing countries of the world like Nigeria, 80 percent of urban solid wastes are disposed of by dumping in open spaces. Research studies also suggest contamination of ground water by disease-causing organisms, as water seeping through dumps is likely to include viruses of poliomyelitis, hepatitis and gastroenteritis (Lakshmikantha, 2006). Thus, such water contamination may have a long term health implication apart from the immediate ones like diarrhoea and dysentery. Also insects, pests and rodents around dump sites act as vectors to many infectious diseases. The poor and unmaintained refuse dumps around our environments, no doubt contribute to environmental pollution and nuisance which are hazardous to human lives. In order to protect human health and the environment from the potential hazards of inappropriate waste disposal and environmental pollution, a systematic, supervised and controlled handling of these wastes is a must. Nigerians have formed the habit of littering the streets with refuse in spite of government warning to rid the street of dirt. The disposal of garbage in the world is a problem that grows with industrialization and population growth. Human life in various Nigerian towns, Agbor inclusive is endangered by the carefree attitude of improper dumping of refuse. Proper collection and safe disposal of the waste of a community are legally recognized as a necessity in an urbanized industrialized society (Mustafe, 1999). The principles of personal and community hygiene are based on our knowledge of the microorganisms and vectors that cause diseases. It is therefore in the light of the above that this

paper seeks to investigate the effectiveness of waste disposal methods and attendant health issues associated with improper dumping of refuse in our environment, with particular reference to Agbor in Delta State, Nigeria.

## **MATERIALS AND METHODS**

### **Study Area/Population**

The study was conducted in Agbor in Ika South L.G.A of Delta State between October and November 2009. The area under study is bounded in the east by Ika North East L.G.A, in the south by Ndokwa West L.G.A and in the north by Edo State. It is located between latitudes 5° 25'N and 6° 35'N and longitudes 5° 58'E and 5° 55'E. The area has a population of about 109,204 (1991 census). The major river, the Orogodo River flows into the town from the south western part. The main occupation of the people is farming and trading.

### **Data Collection Instrument and statistical analysis**

The instrument used for data collection and evaluation in the study is the questionnaire. This was distributed randomly within four selected quarters in the area. The questionnaire consisted of 30 question items in three sections of 10 items each, carefully drawn to elicit responses to the three research hypotheses which are : (a) untreated waste substances around us do not significantly affect our health, (b) our present day refuse disposal methods have not been significantly successful, and (c) the problem of poor refuse disposal has not reached an alarming rate. This research instrument was presented to two senior lecturers in the subject area for scrutiny. Opinions of the respondents were expressed in the simple Yes/No format considering their literacy level. A total of two hundred respondents made up the sample size. Statistical analysis of data collected was carried out using the student t-test at 0.05 level of significance.

**RESULTS**

The results analyzed are presented in Tables 1, 2 and 3.

**TABLE 1:** Health implications of untreated waste materials in our environment

Group	N	Mean (X)	SD	DF (n-1)	t-cal value	t-crit. value	Level of significance	Remark
X1	10	135.0	23.60	18	2.966	2.101	0.05	Null hypothesis rejected
X2	10	65.0						
Total	20							

N=no of population; SD=standard deviation; DF=degree of freedom; t-cal=calculated value; and t-crit=critical/table value.

Table 1 shows the analysis of results obtained from the frequency counts of the responses by the subjects on the effect of poor refuse disposal on our health. 1350 respondents (mean value of 135.0) of the total respondents were positive that untreated waste dumps around our environment

will constitute a health hazard, while 650 respondents (mean value of 65.0) disagreed. The standard deviation for both responses is 23.60. The t-calculated of 2.966 is greater than the t-critical value of 2.101. The null hypothesis is therefore rejected.

**TABLE 2:** Success rate of present day refuse disposal methods

Group	N	Mean (X)	SD	DF (n-1)	t-cal value	t-crit. value	Level of significance	Remark
X1	10	110.0	17.97	18	1.113	2.101	0.05	Null hypothesis accepted
X2	10	90.0						
Total	20							

N=no of population; SD=standard deviation; DF=degree of freedom; t-cal=calculated value; and t-crit=critical/table value.

Frequency counts of the various responses by the subjects on the success rate of our present day refuse disposal methods are analysed and presented in Table 2. 1100 respondents (representing a mean value of 110.0) of the total respondents' frequency were of the view that our

contemporary refuse disposal methods have not been effective; the remaining 900 respondents (representing a mean value of 90.0) disagreed. The null hypothesis therefore is accepted, and it is concluded that Agbor refuse disposal methods have not been successful.

**TABLE 3:** Extent of the problems of waste disposal in our environment

Group	N	Mean (X)	SD	DF (n-1)	t-cal value	t-crit. value	Level of significance	Remark
X1	10	143.2	10.77	18	8.022	2.101	0.05	Null hypothesis rejected
X2	10	56.8						
Total	20							

N=no of population; SD=standard deviation; DF=degree of freedom; t-cal=calculated value; and t-crit=critical/table value.

The extent of the problem of waste disposal in Agbor town is analyzed and presented in Table 3.

The mean of the Yes responses (X<sub>1</sub>) is 143.2 while that of No responses (X<sub>2</sub>) is 56.8. The standard deviation obtained for both responses X<sub>1</sub> and X<sub>2</sub> is 10.77. From the result of the t-test at 0.05 level of significance, the null hypothesis is also rejected since  $t_{\text{calculated}}$  (8.022) is greater than the  $t_{\text{critical}}$  value (2.101), indicating that the problem of poor refuse disposal has reached an alarming rate.

## DISCUSSION

From the result obtained in Table 1, it is evident that there is a health hazard arising from the dumping of untreated waste substances around us. The result corroborates with the views of Nduka, (2008) which states that the consumption of leafy vegetables and crops produced in contaminated soils may pose a health risk to those that reside around the dumps. Also according to Dolk (2002), high frequencies of toxic methemoglobinemia were found in

In Agbor, the literacy level is quite low. Hence, the populace usually adopts the weirdest means of refuse disposal which involves dumping of refuse in water ways/gutters. This has not only increased the incidence of malaria in the locality but has also increased the problem of flooding besides loss of aesthetics. Again, Neal and Schubel (1987) opined that the predominance of houseflies and cockroaches around dump sites point to possible mechanical transmission of diseases, especially in food-causing poisoning. Vleck (1999) also reveals the presence of similar small animals capable of serving as reservoirs of pathogens and parasites in refuse dumps. Solid wastes are known to block roads and provide breeding grounds for diseases carrying insects and rodents. Other researches have also highlighted the detrimental effects of arbitrary dumping in cities (Lakshmikantha, 2006; Swan et al., 2002).

There is a significant difference at 0.05 level of significance in the responses of respondents, as about twice the number of

have not been successful. This finding corroborates that of Onibokun (1999), who stated that the greatest challenges on the environmental health of most African nations are those of municipal solid waste and human excreta. He further observed that bucket latrines and bush defecation are still in vogue in urban slums and rural communities. Although local governments are intended to fund solid waste disposal, less than a quarter of the required money is disbursed (Onibokun and Kumuyi, 2008). Since the resources from the local authorities are often extremely limited and slow in coming, private companies are often contracted for waste disposal. However, these companies are frequently no more effective than the local councils. For instance, in Ibadan in 1991, there were twenty three registered private waste collectors but only ten were found to be operational (Onibokun, 1999). In Agbor, only one registered waste collector from the municipal council goes round once a week to gather refuse within the area. The open dump system of refuse disposal largely used in Agbor and environs is associated with a plethora of health and social effects such as increase in the number of vermin (birds, rodents and insects) which act as disease vectors.

It was also observed that the problem of poor refuse disposal has reached an alarming rate (Table 3). This view is shared with (Cointreau, 1982 and Doan, 1998), who reported that municipal solid waste disposal is an enormous concern in developing countries across the world as poverty, population growth and high urbanization rate together with ineffective and under-funded government efforts militate against efficient management of wastes.

The unhealthy culture of the people of Agbor with regard to refuse disposal has impacted so much on the environment. The ignorance of the people as portrayed in their careless attitude towards refuse disposal is further highlighted.

### **CONCLUSION AND RECOMMENDATION**

Refuse disposal poses serious environmental and health problems especially in Agbor community. Though there are refuse disposal units being coordinated by the local government authority, all of these are so far

place to ensure the health and well being of the people. Secondly, an awareness/enlightenment crusade should be mounted by the public relations department of the council to sensitize the people on healthy refuse disposal methods.

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