Correlated respiratory indicators of Household waste burning practices in Lugbe – Abuja, Nigeria.

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Abstract-
The household waste burning practice and effects of the waste burning emission on respiratory health of the populace in the Lugbe, Abuja happens regularly, though not well recorded. The aim of the study was to quantify the waste burning occurrence as well as investigate the correlation between waste burning practice and respiratory problem in Northern Nigeria with Lugbe as case study since is an example of country side settlement growing to urbanites. Questionnaire was utilized to accumulate information from houses in Lugbe - Abuja. Total of 60 participants were enrolled and their responses on household waste burning besides respiratory symptoms were investigated. The contributors stated that their neighbors burn waste habitually, with 43.5% and 32.4% of them from the central and rural zone respectively. The local waste authorities gathered garbage from 84.5% of these contributors once per week in the enlightened zone and central but rural is once monthly or not at all. The prevalent lower respiratory sign connected with waste burning was dehydrated cough (31.4%). For Lower and Upper health signs, the participants who participated in the practice of waste burning had a faintly higher prevalence of breath shortness (57%) and Water itchy eyes (49%) respectively. For each of lower and upper health signs, the trend is such that 6 months above is greater than immediately, which is greater than those of a month after. These results indicate that waste or bush burning impact on health is on the long – term basis.

Key words: respiratory problem, health signs, burning impact, Lugbe, Abuja.

1. Introduction

Solid waste is the unfunctional and detrimental goods in the solid form ensuing from the Bush and waste burning techniques serve as supportive part to the problem of open-air pollution in the environment, where smoke particles released from this process comprise of tiny particles with aerodynamic distances which are mostly significantly less than 2.5 μm [1]. The chemical components of this particular matter are also varied which have been assessed to contain elemental carbon like PAHs (polycyclic aromatic hydrocarbons), oxalate and WSOC (water-soluble organic carbon), Chlorine (Cl), potassium (K), Zinc (Zn), and so on [2]. Plant-based material has long been assumed through combustion or other processes serve as cause of fine particle organics in the air [3], [4]. A host of gases such as CO2, CH4, NMHC (nonmethane hydrocarbon), CO and are associated with waste burning, as well as explosive and semivolatile organic compounds [5]. The fine particles have been discovered to infiltrate deep into the lower respiratory system (LRS) through the lungs besides threatening health of the Family. Waste or bush burning technique denotes household burning of trash by inhabitants at their own property which is a very common disposal technique utilized in many developing nations [6]. This rubbish can encompass plastics, paper, cardboard, yard trimmings, and several other resources [2], [7]. In the combustion system emissions are spontaneously released straight into the air without filtration or treatment so as to confiscate particulate matter, besides the emissions are
extremely variable, subject to the situations under which burning occurs [7], [12]. U.S Environmental Protection Agency [6], [8], [11], ascribe that waste burning is detrimental to both human wellbeing and the environment, emissions from this practice can intensify respiratory disease like asthma besides increase the risk of heart sickness. Lemieux et al., 2000, reveal that the method could also generate a group of extremely toxic chemicals recognized as dioxins which might then rest on crops or deposit in seaways and disturb the well-being of those who would consume adulterated crops or water. This research will cover waste burning and health impacts study in the Lugbe, Abuja. The research restrictions will embrace the scheme elements of the unified waste burning system and health impact through using unified waste burning(UWB) as an assessment device.

2. Methodology
2.1 Study Area
In this study Lugbe town in Abuja was chosen as an example of rural settlement growing to cosmopolitans besides predominant situation of disparate waste management problems, size, and tasks. Lugbe is among popular remote settlements in AMAC (Abuja Municipal Area Council), Abuja. It is predominantly residential and compactly populated, approximately 17 (seventeen) minutes’ drive from the Abuja Central Business District, 13 (thirteen) minutes’ drive to the Abuja Airport. It’s divided into five (5) districts viz. east, south, west, north and central. Lugbe contiguity to the Abuja city epicenter as well as the Abuja airport have fascinated substantial expansion to the area which is developing quickly. Lugbe is mostly a housing area with lots of housing estates number, some completed as well as occupied while others still under construction like Paradise Parkland, Triumph Estate, Osilama Garden, NCC Estate, FHA Estate, Wisdom Estate, Federal housing authority, Trademore Estate and Shibann Court Estate. Landmarks in Lugbe consist of Voice of Nigeria Transmission Station (VNT), FHA Estate and National Space Development and Research Agency (NSDRA). Being among the fastest growing urbanized centers in the FCT, the population over 3.2millions populaces, the locations are presented in Fig. 1.
2.2 Research Methods and Sampling approaches

In this study, expert personnel collected information by means of a standardized questionnaire from houses in the Lugbe, Abuja, Northern Nigeria. The sample size calculation comprised of an extra fifteen percent reserve population to address any likely sample population loss. WHO endorsed Kish style was utilized for the family participant selection [9]. Health related questions respiration were created based on prevailing validated standard surveys by the American Thoracic Society, Respiratory Diseases Survey [10]. The questionnaire was pretested by the means of a pilot study in a diverse public regions in Northern Nigeria. The questionnaire comprised of enquiries on demographics, waste burning method, physician-diagnosed sicknesses and environmental fitness-related history, was given to participants at their home.

3. Result and discussions

3.1 Demographic Analysis

A Sex and Occupation

The demographic research (Gender and Profession) formed using the three regions Questionnaire that were distributed to twenty households selected randomly making the total of 60 families are presented in Figure 2.
Figure 2: Gender respondent in Lugbe, Abuja.

B Age Group

The Age group formed using the three regions Questionnaire that were distributed to twenty households selected randomly making the total of 60 families are presented in Figure 3.

Figure 3: Age group for Lugbe, Abuja Resident

Figure 2 – 3 displays that demographic figures (gender and age) for Lugbe. Total of 60 participants responded to the questionnaire given to the households in Lugbe, with a partaking rate of 97.4%. Contributors were mostly female (50.3 – 64.2%) while men are (35.8 – 49.7%). Age group (26-35 years) has the highest values whereas the lowest fall within 65 years above.
3.2 Bush Burning
The Bush burning Frequency formed using the three regions Questionnaire that were distributed to twenty households selected randomly making the total of 60 families are presented in Figure 4.

Figure 4: Burning Frequency by Lugbe residents in Abuja

Figure 4 demonstrate that the bush burning practice happened in the households once and twice monthly on a regular basis. In the Lugbe civilized area which was 20 out of 60 households investigated, 24.1% practice waste burning. The contributors stated that their neighbors burn waste habitually, with 43.5% and 32.4% of them from the central and rural zone respectively. The local waste authorities gathered garbage from 84.5% of these contributors once per week in civilized zone and central but rural is once monthly or not at all.

3.3 Health effect of bush burning in Lugbe community
3.3.1 Lower airways signs
The lower health signs made using the three districts Questionnaire that was distributed to twenty (20) families selected randomly making total of 60 people are presented in Figure 5.

Figure 5: Lower illness signs of Lugbe Abuja Resident
3.3.2 Upper airways indications
The Upper health signs using the three districts Questionnaire that was distributed to twenty (20) families selected randomly making total of 60 people are presented in Figure 6.

![Graph showing upper airways indicators](image)

**Figure 6:** Upper illness signs of Lugbe Abuja Inhabitant

Figure 5 and 6 displays the trend for the lower and upper health signs, the contributors who engaged in the waste burning practice had a slightly higher occurrence of breath shortness (57%) and Water itchy eyes (49%) respectively. For each of the lower and upper health signs, the trend is such that 6 month above is greater than immediately, which is greater than those of one month after. These results indicate that waste or bush burning impact on health is on the long – term basis.

4. Conclusion
In this research, total of 60 participants were enrolled and their responses on household waste burning besides respiratory signs were investigated. It was noticed that the contributors who engaged in the waste burning practice had a slightly higher occurrence of cough, water itchy eyes and physician-diagnosed asthma. For lower and upper health signs, the participants who contributed in the practice of waste burning had a faintly higher prevalence of breath shortness (57%) and Water itchy eyes (49%) respectively. For each of lower and upper health signs, the style is such that 6 month above is greater than immediately, which is greater than those of a month after. Additionally, there is probable exposure mistaxonomy, specifically those who do not burn waste but are still vulnerable to air pollutants from their neighbors’ waste burning. Conclusively, these results imply that waste or bush burning effect on health is on the long – term basis.
**Recommendation**

Waste prevention, composting and recycling should be adopted since is relatively low cost technique besides gas emissions will be avoided.

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