



PRELIMINARY STUDIES ON THE RELATIONSHIP BETWEEN NITROGEN-DIOXIDE LEVELS AND HUMAN HEALTH IN AGBOR; DELTA-STATE, NIGERIA.

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Abstract

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Nitrogen-dioxide (NO₂) is an oxidant gas that can penetrate to the small airways and alveoli of the lungs and can impair defense mechanism against respiratory pathogens. This report presents a preliminary attempt to establishing a relationship between Nitrogen-dioxide (NO₂) levels and Human health impact in Agbor. Ten sites were selected to represent areas where air pollution levels might be highest or present particular threat. NO₂ levels were measured using the Palmes diffusion tubes. NO₂ monitoring was done for a period of twelve months. Health outcomes of interest were evaluated from responses to completed questionnaires. The highest indoor NO₂ concentration of 50.02 µg/m³ was recorded in site TL while site OD recorded the least value of 5.18 µg/m³. Indoor NO₂ mean values ranged between 7.28 and 39.93 µg/m³. The correlation between the incidence of the prevalence of respiratory diseases and NO₂ levels were evaluated. The result revealed a very low correlation (r = 0.076) between NO₂ levels and respiratory symptoms[FJPAS 1(1)2016].

1.0 Introduction

Air pollution impacts human health as well as reducing visibility causing brown haze. Health effects can range from respiratory irritation, headaches and coughing through to more serious conditions [1]. A mix of various air pollutants are contained in ambient air pollution. These pollutants however are correlated. Nitrogen-dioxide (NO₂) is a ubiquitous air pollutant both indoor and outdoor which exhibit documented adverse effects on health and welfare [2]. There is a considerable interest in NO₂ as an indoor pollutant as indoor concentrations are consistently more strongly related than outdoor concentrations to personal exposure [3, 4].

In most epidemiologic studies, it is impossible to attribute the health effects to one specific pollutant. A problem called “double counting effect” would arise when the health effects associated with several pollutants simultaneously are simply added up for assessment [5]. To estimate the relevant health

effects, NO₂ was selected as an indicator of air pollution, since there has been strong epidemiologic evidence among air pollutants to support its association with adverse health effects [6, 7, 8]. The toxicology of NO₂ exposure suggest the potential for respiratory symptoms and loss of lung function [9, 10, 11]. In Agbor, apart from the various indoor sources, traffic is considered a major significant factor to the urban pollution load. This problem cannot be overemphasized because the number of vehicles is growing at a high rate due to urbanization. Imagine that an individual is in poor health; as such he may not be able to conduct strenuous or sustained work. This limits his labour market opportunities and provides him with lower wages (if employed). Because the household exist in poverty, he cannot afford to pay for goods that could improve his health and thus improve his work ability. It becomes a vicious cycle, where because members of the household are both financially disadvantaged and in