Noise above a certain acceptable level or sustained noise may cause damage to the ears. The aim of this study is to determine the prevalence and level of awareness of noise induced hearing loss in Calabar. Seventy-five workers from two noise producing companies, in Calabar- Flour mill and Wartsilla were chosen for this study. An author administered questionnaire was used to record sociodemographic data, occupation, access to ear protection, number of working years, etc; Rhine’s test, Webers test, otoscopy and pure tone audiometry were done for each of the participants.

INTRODUCTION
Noise is sound of irregular frequency. The noise we hear daily may become harmful. When these sounds are too loud even for a brief moment or when they are both loud and long lasting, the can cause noise induced hearing loss (NIHL). Noise induced hearing loss can affect any age or sex. It may be just a threshold shift that is reversible or permanent loss and this may affect any or both ears. Sounds less than 75dB even after long exposure are unlikely to cause NIHL but long or repeated exposure to sound of 85dB or above can cause NIHL. Conversational voice is in the region of 40-50Db. Harmful noise exposure is a daily occurrence in Nigeria and there is so much ignorance about it. In spite of this, the prevalence and awareness of NIHL and even its prevention have not been adequately addressed hence this paper seeks to address this aspect of hearing loss in our environment.

METHOD
A total of 75 workers, 65 male and 10 female were randomly selected from Wartsilla power generating company out of two hundred and fifteen workers; Forty-one of the noise exposed workers in Flour mill (66.83%) had mild hearing loss and six (11.76%) had moderate loss. Three non-noise exposed workers in each of the companies also had mild hearing loss. 40% of the participants never heard about ear protection devices; 60%, knew about them. 50% had seen them and 30% felt better using them.

KEYWORD: Awareness, hearing loss, prevalence, Calabar.
60Db; Severe hearing loss 61-80Db. Included in this study were those who have put in a minimum of eight years in their respective companies. Data collected was analysed using Epi-info version 6 and results presented in tables. Variables are considered statistically significant if the p value was 0.05.

RESULTS
The age range for noise exposed partakers was 22-48 years with a mean of 30 years. The age range for non-noise exposed subjects was 22-60 years with a mean of 41 years. The overall male: female ratio was 4:1 Flour mill had 60 noise exposed workers(80%) and 15 non-noise exposed workers (20%). Wartsilla had 51 noise exposed workers (68%) and 24 non noise exposed workers(32%). Overall number of noise exposed workers in both factories was 111 representing 74% of all the workers and non-noise exposed workers 39 i.e 26%. All noise exposed workers in wartsilla were provided with ear protection devices (ear muffs) but only 39 workers (76.47%) of the noise exposed workers wore them as specified. The others did not believe the devices made any difference or they did not wear them because of the inconvenience associated with them. At the time of this study, no one in flour mill used any form of ear protection because they were not provided.

Pure tone audiometry results showed, 13 persons in flour mill had a threshold shift at 4000HZ (21.66%) and 6 participants at 6000HZ (10%).
8 participants at wartsilla (15.8%) had a threshold shift at 4000HZ and 2 participants at 6000HZ (3.92%)

### NOISE LEVELS RECORDED:

|                  | FLOUR MILLS           | WARTSILLA       |
|------------------|-----------------------|-----------------|
| Power plant      | 87-110dB (105)        | 90-115dB(110)   |
| Production       | 82-106dB (95)         | 85-105dB(100)   |
| Loading bay      | 59-86dB (78)          | Transport office|
| Mechanic workshop| 55-70dB (62.5)        | 45-55dB(50)     |
| Staff clinic     | 40-50dB (45)          | Canteen         |
| Secretariat      | 45-55dB (50)          |                 |

The highest noise level recorded was 115Db (power plant) and the lowest was 40Db. The power plant, loading bay, production plant were regarded as noise exposed areas while the staff clinic, secretariat and canteen were taken as non-noise exposed areas. The profile for this exposure at wartsilla showed the same values as those of flour mill.

Fifty one (68.33%) of the noise exposed group in flour mills had mild hearing loss and ten (16.66%) were moderate. Twenty-six of these were right sided disorders while sixteen were left sided and nine bilateral. So 85% of noise exposed workers in flour mill had hearing loss. In Wartsilla, twenty six(50.98%) of the noise exposed persons had mild hearing loss and six workers (11.76%) had moderate loss. Thirteen were right sided, thirteen left sided and nine bilateral. In all, (62.74%) of the noise exposed workers in wartsilla had hearing loss. Three participants (20%) in the non-noise exposed group at flour mill had mild hearing loss while three persons(12.5%) also in the non-noise exposed group at Wartsilla had hearing loss.

The questionnaires revealed that out of 150 respondents, sixty (40%) never heard about ear protection, ninety (60%) have heard about ear protection, seventy five(50%) have used the devise, thirty nine appreciate its benefits, one hundred and eleven (74%) are indifferent to its advantages.

### Table 1: Distribution of Hearing Loss, Flour Mill.

|            | Right ear | Left ear | Bilateral | Total |
|------------|-----------|----------|-----------|-------|
| Mild       | 22        | 13       | 6         | 41    |
| Moderate   | 4         | 3        | 3         | 10    |
| Severe     | -         | -        | -         | --    |
| Profound   | -         | -        | -         | --    |
| Total      | 26        | 16       | 9         | 51    |

### Table 2: Distribution of Hearing Loss, Wartsilla

|            | Right | Left | Bilateral | Total |
|------------|-------|------|-----------|-------|
| Mild       | 9     | 11   | 6         | 26    |
| Moderate   | 4     | 2    | 0         | 6     |
| Severe     | -     | -    | -         | -     |
| Profound   | -     | -    | -         | -     |
| Total      | 13    | 13   | 6         | 32    |
At flour mill Calabar, noise was essentially generated from the electrical and production plants while Wartsilla mainly generated noise from the power house. In both places the sound level exceeded the threshold of 90dB.85% of the workers in flour mill and 62.74% of those in wartsilla had hearing loss. This study has shown a high prevalence of hearing loss in the noise exposed workers compared to the non noise exposed workers and the difference between the two groups is significant. The prevalence of noise induced hearing loss in flour mill was 85% and at wartsilla, 62.74%. These rates are comparable to those found by other investigators in Nigeria, Malasia, India. (Tenaj et al 2014, Ahmad et al 2013, Omokhodion et al 2009)The difference observed between wartsilla and flour mill may be attributed to the use of ear protection by some of the wartsilla workers; besides wartsilla has been around for only fifteen years whereas flour mills is more than 40 years in existence. The workers are exposed to longer years of noise. The reason is because damage to hearing may occur following very loud sound for a moment or sound above a particular decibel for a long period of time. Hearing loss may show up in the first ten year but may commence as early as 5-9 years.(Ali et al 2012, Oleru et al 1980)thus the difference in prevalence rate of hearing loss. The degree of hearing loss ranged from mild to moderate degrees only. Based on the WHO classification of hearing loss there was no instance of severe or profound hearing loss. This finding agrees with those of Ologe et al (Ologe et al 2008, Omokhodion et al 2009, Alberto et al 1997).

Of the noise exposed workers in flour mill, twenty six (44.33%) had right sided loss, sixteen (26.66%) had left sided loss, nine had bilateral loss. Out of the fifty-one people, four one (68.33%) had mild hearing loss and ten (16.77%) had moderate loss. In wartsilla, thirteen people (25.49%) had right sided loss, thirteen (25.49%) had left sided loss and six (11.76%), bilateral loss. Out of the thirty two people, twenty six (50.98%) had mild loss and six of them, (11.76%) had moderate loss.

In the non- noise exposed group, three workers in flour mill (20%) and three in wartsilla (12.5%) had mild loss. This is the level of hearing loss that is not easily noticeable and most people are not aware of it because there are no avenues for routine hearing checks.

This study agrees with findings of Ali et al that unilateral loss occurs as part of NHIL even though the standard definition of NHIL involves both ears (Ali et al 2012). The right side was affected more than the left in this study. Many workers have found that males are more affected than females, (Omokhodion et al)likewise in this study most of the workers are males besides, no female happened to be in the noise exposed areas.

The average threshold shift for noise induced hearing loss is at 4Khz. This is an early indicator but is not pathognomonic for NHIL since it may also be found in response to ototoxic drugs.(Alberto et al 1997)In all, we had twenty one partakers with threshold shift of 4Khz and eight of them at 6Khz. In Brazil, De carvalho et al in their audiometric tests for NHIL considered 3, 4, and 6Khz frequencies as hearing threshold averages for they were the most affected by NHIL. (De carvalho et al)
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QUESTIONNAIRE

CONSENT FORM

I, MR/ Mrs/Chief/Dr/Prof/Rev/Miss---------------------------------------------Whose
address is--------------------------------------------------------------------------------------------
Agree to be part of this research, Prevalence and awareness of noise induced hearing loss in two factories in Calabar, Cross river state.

Sign/Thumb print: 
-------------------------------------------------------------------Date-----------------------------------------------
--------Time--------Name of witness------------------------------------Sign-----------------------------------------------
Date.

Name:
Age:
Sex:
Address:
Occupation:
Workplace:
Job description:
No of years at work:
Any knowledge about ear protection?
Source of knowledge: workplace/Radio/Television/Before employment.
Do you think ear protection devices can help you?
Do you desire an ear protection device?
What would you have loved to change in your work place?