

## Knowledge and Perception of Noise Induced Health Hazards Associated with Generator Use in Selected Commercial Areas in Ibadan, Nigeria

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### Abstract

**Background:** The increasing use of electric generators in commercial settings is predicated on the erratic and inadequate power supply in Nigeria. Generators produce noise and gaseous emissions while in operation exposing users of this energy source to a variety of health hazards.

**Objective:** This study was therefore designed to assess the knowledge and perception of generator users towards the noise induced health hazards associated with generator use in two commercial communities in Ibadan.

**Methods:** A comparative cross sectional study was conducted in Agbowo (high generator use) and Ajibode (low generator use) areas of Ibadan. All 515 generator users in both communities (Agbowo: 304, Ajibode: 211) were surveyed. Information on socio-demographic characteristics, knowledge and perception were obtained with a pretested interviewer-administered questionnaire. The knowledge and perception scales were 17 and 8 respectively, with maximum score of 1 and minimum score of 0. Knowledge score of (9-17) and (0-8) were categorized as good and poor knowledge respectively, while perception score of (5-8) and (0-4) were categorized as positive and negative perception respectively. Data were analyzed using descriptive statistics and Chi-square test 5% level of significance.

**Results:** The mean age of respondents in Agbowo and Ajibode were 25.4±5.4 and 24.8±5.8 years respectively. The mean knowledge and perception score was 11.4±4.9 and 4.3±2.1 in Agbowo as compared to 13.9±3.8 and 4.1±2.2 in Ajibode (p<0.05). A higher proportion of generator users in Agbowo had good knowledge (53.3%) as compared to those in Ajibode (44.5%). Majority of respondents in both commercial areas, (Agbowo: 82.9% and Ajibode: 86.7%) admitted that

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sound from an electric generator was a noise source capable of inducing hearing impairment, but none were aware of the sound level that could cause it. The proportion of respondents with negative perception were 51.3% and 82% in Agbowo and Ajibode respectively ( $p < 0.05$ ). Few respondents (Agbowo: 7.7%; Ajibode: 5.0%) perceived noise induced hearing impairment as a serious health problem as compared to other health conditions. Although 80.3% and 26.1% in Agbowo and Ajibode respectively perceived their workplace to be noisy ( $p < 0.05$ ), only 11.5% and 6.6% desired to change occupation.

**Conclusions:** Despite the good knowledge observed in Agbowo and Ajibode, none were aware of sound levels detrimental to their health. The insidious nature of noise on hearing further compounds this problem as individuals are unaware until a large threshold shift (hearing loss) has occurred. Hence there is need for increased awareness on the hazards associated with generator use while access to steady power supply is being advocated.

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**Key words:** Electric Generator, Power supply, Perception, Non-auditory effect

## **Introduction**

Electrical power is a very important commodity for development of any nation. With electrical energy the people are empowered to work from the domestic level, through the small-scale and medium-scale industries to employment in the large-scale manufacturing complexes.<sup>1</sup> Most cities connected to the national electrical power grid have been deprived of electricity for over a decade now due to current power production of about 3000MW of electricity. According to the Nigerian Energy Policy report from 2003, it is estimated that the population connected to the grid system is short of power supply over 60% of the time.<sup>2</sup> In addition, less than 40% of the population is even connected to the grid.<sup>2</sup> On a fundamental level, there is simply not enough electricity generated to support the entire population.

Alternative source of energy such as electric generators are on the increase among the citizenry<sup>3</sup>, due to the high demand for power supply. Many people and companies now supplement the electricity provided by the national grid system with their own generators. In fact, as long as you can afford a generator you should have one. Commercial business owners are not left out, according to one approximation, well over 90% businesses utilize generators for day to day operations.<sup>4</sup> This in-turn have raised prices of domestic goods, and companies which import generators have created extremely lucrative industry.

Electric generators while in operation produce gaseous emissions and high sound levels. These pose serious health risk to not only users but to individuals in the surrounding communities. A recent study conducted in Ibadan revealed high generator noise level of between 91.2 and 100.5 dB(A).<sup>5</sup> This noise level is capable of inducing hearing impairment.<sup>6</sup> Noise Induced Hearing Loss (NIHL) can be caused by one time exposure to noise as well as repeated exposure to noise at various levels of loudness over an extended period.<sup>6</sup> NIHL is hardly a matter of public health concern in many developing countries such as Nigeria. There are few or poorly enforced noise –

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pollution control laws in many parts of the country. In the rapidly industrializing parts of the country, the occupational groups exposed to noise pollution are hardly aware of the health risks of the noise levels at their places of work. There are certainly no protective measures in use in these industries to reduce the impact of noise on the health of the workers. Another study on gaseous emissions revealed that carbon monoxide concentration from generators studied ranged between 10.7 and 39.0ppm which was above the National Guideline Limit of 9ppm.<sup>7</sup>

Health effects from generator use can range from auditory (hearing) to non-auditory. Noise and carbon monoxide pose serious health risk and due to the insidious nature of noise on hearing, many individuals may not discover they have hearing difficulty until it has become worse. In addition, due to the strive to achieve financial sustenance, many often neglect their health and work at relatively short distances from generators, and at long hours.<sup>5</sup> A lack of knowledge is identified as one of the barriers to change.<sup>8</sup> Knowledge about occupational hazards (such as noise from electric generator) is suggested to be a predictor of preventive behaviour at work.<sup>9</sup> Effective behavioural change is facilitated by greater knowledge, experience, and personal risk perception.<sup>10</sup>

Risk perception is the subjective assessment of the probability of a specified type of accident happening and how concerned we are with the consequences.<sup>11</sup> Risk perception plays a significant role as a predictor of workers' protective behaviour, such as, use of hearing protection devices.<sup>12</sup> Very few studies have assessed the knowledge and perception of generator users to the hazards associated with generator use. Therefore this study was aimed at examining the knowledge and perception of generator users in relation to noise induced hearing impairment in Agbowo and Ajibode commercial communities in Ibadan, Nigeria.

## **Materials and Methods**

This study was conducted in Agbowo and Ajibode commercial areas of Ibadan, Nigeria after obtaining proper compulsory ethical review by the University of Ibadan (UI) and University College Hospital (UCH) Ethical review committee, Ibadan. Participants in these commercial areas were duly informed and consent was obtained. This study also went through proper required institutional review board procedures at the College of Medicine, University of Ibadan prior to its initiation.

**Study Design.** A comparative cross-sectional design was used which involved questionnaire administration to volunteer participants (generator users).

**Study Area.** Agbowo and Ajibode are both located in Ibadan, the capital of Oyo State in Nigeria. Ibadan, one of the largest metropolitan cities in West Africa, is a primarily indigenous city with millions of inhabitants, most of which are Yoruba; other ethnic groups constitute smaller proportions of the population. The Agbowo business area is situated directly opposite the University of Ibadan and is a high commercial activity area encouraging small scale businesses.<sup>13</sup>

The Ajibode business area is also at close proximity to the University of Ibadan campus, but experiences relatively lower daily business activity.

**Study Population.** The general population included small business shops operators above 14 years of age in Agbowo and Ajibode who had given informed consent to participate in the study. The total sampling technique, i.e., maximized convenience sample, was employed. There were 515 participants from Agbowo (n=304) and Ajibode (n=211).

**Surveys.** A semi-structured interviewer administered questionnaire was used to obtain information on the knowledge and perception of participants as regards hazards associated with generator noise. The questionnaire was divided into three sections namely: Section A: Socio-demographic Information, Section B: Occupational History and Pattern of Generator Use, Section C: Knowledge Information and Section D: Perception Information. Each questionnaire was carefully reviewed for completeness and appropriateness of responses. Both knowledge and perception were scored, with the maximum score of 1 and minimum score of 0.

**Statistical Analysis.** Data were entered into Microsoft Excel and then managed and analyzed using the Statistical Package for Social Sciences (SPSS) version 15. Data were analyzed using descriptive statistics, Chi-square test and logistic regression at 5% level of statistical significance.

## Results

**Socio-demographic Characteristics.** The age of participants in both business locations ranged from 14 to 39 years. Majority 394(76.8%) were above 20 years of age while those below 20 years of age were 121(23.5%). Agbowo commercial area comprised 175 (57.9%) male and 129 (42.4%) female whose age range was between 14-39years with mean age of 25.3±5.3 years. While Ajibode commercial area comprised 112(53.1%) male and 99(46.9%) female whose age range was between 14-39years with mean age of 24.8±5.8 years. See Figure 1.0 for details. Christianity 206(67.8%) was the main religion practiced in Agbowo followed by Islam 97(31.9%) and traditional religion 1(0.3%), while in Ajibode Christians constituted 138(65.4%), Islam 70(33.2%) and traditional religion 3(1.4%). Among the respondents in Agbowo 166(54.6%) had secondary education, 113(37.2%) had tertiary education, 16(5.3%) had primary education and 9(3.0%) had no education. While in Ajibode, about 142(67.3%) had secondary education, 43(20.4%) had tertiary education, 20(9.5%) had primary education and 6(2.8%) had no education.

**Knowledge of health hazards associated with generator use:** Table 2.0 highlights participants knowledge on the hazards associated with generator use. The mean knowledge score was  $11.4 \pm 4.9$  in Agbowo as compared to  $13.9 \pm 3.8$  in Ajibode ( $p < 0.05$ ). More than half of respondents in Agbowo 173(56.9%) and Ajibode 186(86.2%) agreed that “utilization of electric generators poses great harm to the health of the public”, while a large proportion of participants in Agbowo 143(47%) and Ajibode 179(84.8%) indicated that “indoor use of electric generator is detrimental to health”. Majority of the participants in Agbowo 252(82.9%) and Ajibode 183(86.7%) were knowledgeable of the fact that “noise from electric generator can cause impaired hearing”, while a large proportion of the respondents in Agbowo 225(74.0%) and Ajibode 121(57.3%) believed that noise from an electric generator can bring about conflict among neighbours. Few of the participants in Agbowo 46(15.1%) and Ajibode 71(33.6%) actually agreeing to the fact that “exposure to noise from generator can cause sleeplessness. A high proportion of respondents in Agbowo 277(91.1%) and Ajibode 153 (91.9%) did not believe that dispensing fuel into an electric generator while in use could pose any danger. A large proportion in Agbowo (72.1%) as compared to Ajibode (37.9%) were not aware of the high public health concern due to influx of generators. Majority agreed that using hearing protection devices can protect oneself from hearing impairment (Agbowo: 82.9; Ajibode: 86.7%).

**Perception of Risk Associated with Exposure to Generator noise:** The mean perception score was  $4.3 \pm 2.1$  in Agbowo as compared to  $4.1 \pm 2.2$  in Ajibode ( $p < 0.05$ ). Majority of the participants in Agbowo 200(65.8%) and Ajibode 157(74.4%) agreed that “noise at work was a major contributor to the loss of quality life by worker”. A large proportion of participants in Agbowo 254(83.6%) and Ajibode 166 (78.7%) perceived it a major disability to lose one’s hearing as majority in Agbowo 239(78.6%) and Ajibode 192(91.0%) agreed that “exposure to high noise levels from generator over a long time could affect the hearing capacity. In Agbowo 143(47%) disagreed that “the chance of developing hearing loss at their workplace was low” as compared to a little above half of participants in Ajibode 123(58.3%) who agreed that chance of hearing loss was low in their work environment. Majority of the participants in Agbowo 115(37.8%) disagreed that generators were a blessing to mankind as compared to those in Ajibode 90(42.7%) who felt indifferent. A large proportion of participants in Agbowo 204(67.1%) and Ajibode 109(51.7%) felt it was necessary to reduce noise from generator

**Perceived Concern for NIHL in relation to other Health Conditions:** Generally, few respondents in both Agbowo(7.70%) and Ajibode(5.0%) were less concerned about Noise Induced Hearing Loss as compared to other Health conditions. Similar proportion of respondents (31%) in both Agbowo and Ajibode were concerned about cancer as compared to 45.7% and 30.6% in Agbowo and Ajibode who were concerned about accidents. Majority in Ajibode (32%) as compared to Agbowo (15%) were concerned about chemical burn.

## Discussion

The findings of this study revealed that, the mean age of participants in Agbowo and Ajibode was  $25.3 \pm 5.3$  years and  $24.8 \pm 5.8$  years. A previous study conducted among Nigerian traders revealed a mean age of  $24 \pm 1.3$  years.<sup>14</sup> Similarly another study conducted among operators of grinding machine revealed mean age of  $31.2 \pm 1.83$ .<sup>15</sup> There is a high level of knowledge that generators pose serious harm to health. Similar findings were observed in a study conducted among generator users in Ilorin, which revealed high level of awareness that generator use is hazardous.<sup>16</sup> According to recent studies, noise have been found to cause hearing impairment, as majority of the respondents agreed to that fact.<sup>15,17,18,19</sup>

High level of awareness observed among generator users in Agbowo and Ajibode on the use of hearing protection devices to protect oneself from hearing loss was not surprising as some of them were observed using clothes and scarf's to cover their ears. However none of the respondents were observed using proper hearing protection devices. The effectiveness of hearing protective equipment in preventing noise induced hearing loss is greatly dependent on the correct use and faithful wearing of the equipment.<sup>20</sup> In a study conducted in a steel rolling mill in Nigeria, the author reported that less than half of the workers properly use their Hearing Protection Devices (HPDs), and attributed this finding to the fact that they were poorly monitored and lacked adequate information.<sup>21</sup> The result of this present study is not surprising as the National Environmental Standard Regulation Enforcement Agency (NESREA) whose statutory responsibility is to enforce the use of HPDs in noisy work environments is ineffective and requires immediate attention.

More than half of the respondents did not agree that generators could cause sleep disturbance, although sleep disturbance is one of the most serious effects of exposure to noise. The World Health Organisation (WHO) guideline for a good sleep is 30 dB(A), while noise levels exceeding 45 dB(A) should be avoided.<sup>22</sup> Sleep disturbance caused by generator noise can cause conflict among neighbours, and more than half of the respondents agreed to that fact. None of the respondents knew the actual sound level detrimental to health, although they were aware high noise levels could cause hearing impairment.

Effective behavioral change is facilitated by greater knowledge, experience, and personal risk perception.<sup>10</sup> The findings of this present study revealed that majority of the respondents in Agbowo and Ajibode considered or perceived hearing loss to be a serious health problem. A Swedish study involved a sample of workers (majority: males) in manufacturing industry and measured perception almost the same way as I did (item: I think it would be big problem if I lost my hearing). It reported that the majority (90%) of respondents considered hearing loss to be a serious health problem.<sup>23</sup> Although the subjects of this study were different (in terms of occupation, workplaces etc.), they arrived at similar findings as documented here. The implication of this is that nobody wants to go deaf, but their actions speak otherwise. This may be associated to the insidious nature of noise effects.

However, majority of the respondents in this study considered NIHL as a less serious hazard than other health conditions such cancer, accident and chemical burn. A pilot study conducted among workers in a beverage industry also corroborated this findings revealing that noise was



considered a low priority among other issues such as accidents, poor sanitation, product quality and absenteeism.<sup>24</sup> Similarly, a recent study on firefighters on noise exposure and hearing loss showed that fire fighters thought that noise and NIHL was a major occupational health problem; however when asked to name the major problems in terms of mortality and workdays lost, NIHL turned out to be a low priority hazard compared to other health problems.<sup>25</sup>

The lower level of concern about noise induced hearing loss (NIHL) among the respondents compared to other health problems/diseases can be explained by the fact that risk perception is influenced by a lot of factors including dread, control, or extent of damage/severity of consequences.<sup>11</sup> Thus, the lower ranking of NIHL among a given set of hazards or diseases may be a reflection of the relative contributions of these factors. Risk perception is influenced by dread and cancer is viewed as a dreadful disease.<sup>11</sup> Moreover, perception of risk is thought to be higher for events that can have catastrophic effects or events on which people have little control.<sup>11</sup> Thus, proportions assigned by the respondents in Agbowo and Ajibode to chemical burns and accidents could be explained by this.

Although (67.1%) in Agbowo and (51.7%) in Ajibode felt it was necessary to reduce the noise from electric generators, it did not motivate them to protect themselves from the harmful effect of noise by using hearing protective devices (HPDs) or enclosing their generators. The government should seize this opportunity to enlighten them of the importance of their hearing ability on the general quality of their life and provide adequate means of noise reduction strategies for generators in this commercial environment.

### **Implication for prevention and control interventions**

Findings from this study have several implications for environmental health and safety interventions. Awareness of the reality and magnitude of noise induced health hazards associated with exposure to generator noise must be raised among the users of this energy source. This is needed to enable individuals adopt necessary prevention and protective measures while utilizing a generator. Various opportunities and channels of information dissemination including print and electronic media should be made readily accessible to generator users.

Generator users must be made aware that poor condition of generators increase the noise levels produced. The main sources of noise in a generator are the cooling fan cover, silencer shell, silencer cover and engine crankcase.<sup>24</sup> These parts need to be maintained regularly as poor conditions of these parts contribute to high noise levels produced from electric generators.

Furthermore, employers must protect their workers ensuring that the workplace is safe for work. The Federal Environmental Protection Agency now Nigeria Environmental Standard Regulation Enforcement Agency (NESREA) requires employers to provide employees with proper protection against the effects of noise exposure when sound levels exceed an 8-hour time weighted average (TWA) of 90 dBA (Permissible Exposure Level).<sup>25</sup> Such measures include modifications of the machinery, the workplace operations, the layout of the workroom and provision of adequate personal protective equipments (PPE). In fact, the best approach for noise

hazard control in the work environment, is to eliminate or reduce the hazard at its source of generation, either by direct action on the source or by its confinement.<sup>26</sup>

## **Conclusion**

Exposure to noise from electric generator could pose serious health implications such as Noise Induced Hearing Loss (NIHL), therefore a longitudinal study could be carried out to find out the long term effect of exposure to generator noise. Respondents could be observed at work and home where generators are used. Furthermore an intervention study could be carried out to train workers on harmful effect of noise on hearing stating the level at which noise is considered dangerous because the present study shows respondents had poor knowledge about the harmful level of noise at work and majority of respondents in both Agbowo and Ajibode considered noise induced hearing loss (NIHL) to be of lower concern compared to other health effects.

The level of knowledge of generator hazards was generally high among respondents in Agbowo and Ajibode with majority being knowledgeable of the effects of noise exposure on their health and also aware of the insidious onset and gradual manifestation of noise induced hearing loss (NIHL). A dichotomy between knowledge and practice was observed in this study. The results show high degree of knowledge among generator users on the hazards associated with generator noise, but this was not reflected in self protective practices, as onsite observations revealed non use of hearing protective devices (HPDs) and working at close distances from generators. The future intervention study would also address the training generator users on the use of adequate personal protective devices such as ear muffs and ear plugs while working with electric generators.

**Competing interest:** The authors declare that they have no competing interest

**Authors' contributions:** All the authors contributed to this study in ways consistent with International Journal of Collaborative Research on Internal Medicine & Public Health (IJCRIMPH) authorship criteria. All the authors read and approved the final version of this manuscript.

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**Conflict of Interest:** None to declare.

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## **References**

1. Ekpo, U. N., Chuku A. C, Effiong E. L. The dynamics of electricity demand and consumption in Nigeria: Application of bounds testing approach. *Current Research Journal of Economic Theory*. 2011; 3(2): 43-52.
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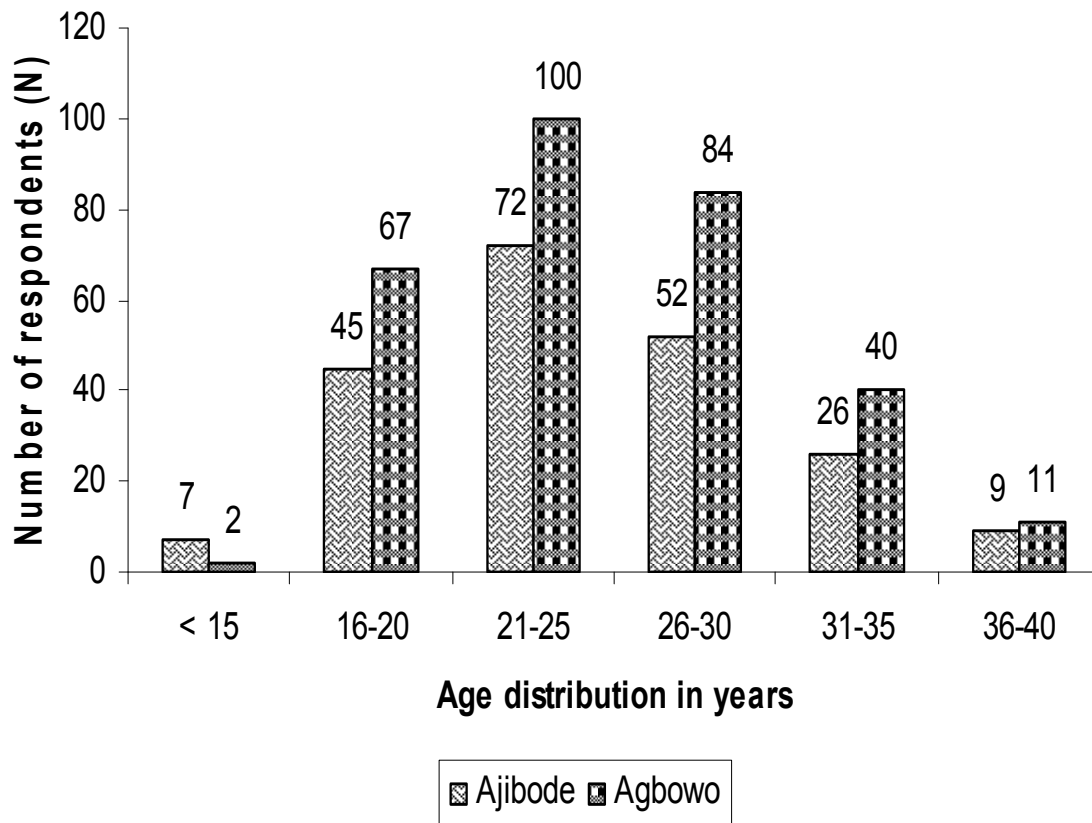


2. Okoye, J.K and Achakpa, P.M. Background Study on Water and Energy Issues in Nigeria to Inform the National Consultative Conference on Dams and Development. The Federal Ministry of Agriculture and Water Resources and Society for Water and Public Health Protection, Abuja, Nigeria. 2007
3. Ibitoye, F. I, Adenikinju A. Future demand for electricity supply in Nigeria. *Applied Energy*. 2007; 84: 492- 504.
4. Oparaku, O. U. Rural area power supply in Nigeria: a cost comparison of the photovoltaic, diesel/gasoline generator and grid utility options. *Renewable Energy*, 2003; 28: 2089-2098.
5. Yesufu A. L, Ana G. R. E. E. Electric Generator Characteristics, Pattern of Use and Non Auditory Health Effects Experienced by Commercial Workers in Agbowo and Ajibode Areas of Ibadan, Nigeria. *Review of Global Medicine and Healthcare Research*. 2012; 3(2): 159-171.
6. World Health Organisation (WHO). 1993. Prevention of blindness and deafness. Retrieved 10<sup>th</sup> May, 2010 From [http://www.who.int/pbddeafness/hearing\\_impairment-grades/en/index.html](http://www.who.int/pbddeafness/hearing_impairment-grades/en/index.html).
7. Olowolade. A. T., 2010. Generator Emissions and Respiratory Problems Experienced by Persons Working in Business Centers in Ibadan, Nigeria. Dissertation submitted to the Department of Environmental Health Sciences, Faculty of Public Health, College of Medicine, University of Ibadan.
8. Grol R, Wensing M. What drives change? Barriers to and Incentives for Achieving Evidence Based Practice. *Medical Journal of Aust*. 2004; 180(6):57.
9. Cheung, C. Organizational influence on working people's occupational noise protection in Hong-Kong. *Journal of Safety Research*. 2004; 35: 465-475.
10. Gregson, S., Zhuwau, T., Anderson, R. M. and Chandiwana, S. K. Is there evidence for behavior change in response to AIDS in rural Zimbabwe? *Social Science and Medicine*. 1998; 46(3): 321-330
11. Sjöberg L, Moen B. E, Rundmo T. Explaining risk perception. An Empirical Evaluation of Cultural Theory; September, 2004. Retrieved May 14<sup>th</sup> 2009 from:  
[http://www.svt.ntnu.no/psy/Torbjorn.Rundmo/Psychometric\\_paradigm.pdf](http://www.svt.ntnu.no/psy/Torbjorn.Rundmo/Psychometric_paradigm.pdf).
12. Arezes, P. M., Miguel, A. S. Hearing protectors acceptability in noisy environments. *Annals of Occupational Hygiene*. 2002; 46: 531-536.
13. Tomori, M. A. 2006. Ibadan Metropolitan area and the challenges to sustainable development. Retrieved 6<sup>th</sup> June, 2010 from <http://macosconsultancy.com/Ibadan%20metropolitan.html>
14. Ighoroje A. D. A, Marchie C, Nwobodo E. D. Noise induced hearing impairment as an occupational risk factor among Nigerian traders. *Nigerian Journal of Physiological Sciences* 2004; 19(1-2): 14-19
15. Bisong, S. A., Umana A. N, Onoyom-Ita V, Osim E. E. Hearing Acuity loss of operators of food grinding machines in calabar, Nigeria. *Nigerian Journal of Physiological Sciences*. 2004; 19: 20-27
16. Makinde, T. M., Owoyemi, J. O. Awareness and attitude to social and health hazards from generator use in Anyigba, Nigeria. *Research Journal of Medical Sciences*. 2008; 2(4): 185-189.

17. Elias, S. O., Ijaduola G. T. A, Sofola O. A. Noise-induced hearing loss in laundry workers in Lagos. *Nigerian Medical Practice*. 2003; 44: 3-6.
18. Minja, B. M., Moshi N. H, Riwa P. Noise induced hearing loss among industrial workers in Darus Salaam. *East African Medical Journal*. 2003; 80: 298-302.
19. Boateng, C. A., Amedofu G. K. Industrial noise pollution and its effect on the hearing capabilities of workers. A study from saw mills, printing presses and cornmills. *African Journal of Health Sciences*. 2004; 11: 55-60.
20. Sulkowski, W. J., Szymczak W., Kowalska S, Sward-Matyja M. Epidemiology of occupational noise induced hearing loss in Poland. *Otolaryngol Pol Journal*. 2004; 58(1): 233–236.
21. Ologe F. E., Akande T. M, Olajide T. G. Noise exposure, awareness, attitudes and use of hearing protection in a steel rolling mill in Nigeria. *Occupational Medicine* 2005; 55(6):487–489.
22. World Health Organization Regional Office for Europe, 2004. Noise and sleep. Technical meeting on sleep and health. Bonn, Germany. Retrieved 17<sup>th</sup> May 2010 from <http://w.w.w.euro.who.int/Noise/activities/20040304>
23. Svensson, E. B., Morata T. C, Nylen P, Krieg E. F, Johnson A. C. Beliefs and attitudes among Swedish workers regarding the risk of hearing loss. *International Journal of Audiology*. 2004; 43(10): 585-593.
24. Tandon, N., Nakra B. C, Ubhe D. R, Killa N. K. Noise control of engine driven portable generator set. *Applied Acoustics*. 1998; 55: 307–328.
25. Federal Environmental Protection Agency (FEPA). 1991. National interim guidelines and standard for industrial effluents, Gaseous emission and hazardous waste in Nigeria. Retrieved 13<sup>th</sup> July, 2010 from [www.fepanigeria.com/interimguidelines](http://www.fepanigeria.com/interimguidelines)
26. National Institute of Occupational Safety and Health (NIOSH). 1996. Preventing occupational hearing loss. A practical guide. Cincinnati, OH:DHHS, CDC, NIOSH. Retrieved 10<sup>th</sup> November, 2010 from <http://www.cdc.gov/niosh/docs/96-110/pdfs/96-110.pdf>.

**Table 1:** Respondents Socio-demographic Characteristics

Demographic Information	Features	Agbowo		Ajibode	
		N	%	N	%
Sex	Male	174	57.2	112	53.1
	Female	130	42.8	99	46.9
Education	None	9	3.0	15	2.9
	Primary	16	5.3	36	7.0
	Secondary	166	54.6	308	59.8
	Tertiary	113	37.2	156	30.3
Religion	Christianity	206	67.8	138	65.4
	Islam	97	31.9	70	33.2
	Traditional	1	0.3	3	1.4

**Figure 1:** Age Distribution of the respondents in Agbowo and Ajibode Business Areas

**Table 2:** Respondents Knowledge on the hazards associated with generator use

Variable	Options	Agbowo		Ajibode	
		(N)	(%)	(N)	(%)
Electric generator use poses harm to human health	True	173	56.9	186	88.2
	False	131	43.1	25	10.8
Indoor generator use is a source of indoor noise pollution	True	143	47.0	179	84.8
	False	161	53	32	15.2
The Noise from an electric generator can cause impaired hearing	True	252	82.9	183	86.7
	False	52	17.1	28	13.3
There is a heightened public concern over the influx of generators into the country as well as their use	True	85	28.0	131	62.1
	False	219	72.1	80	37.9
The utilization of generators at home can cause conflict among neighbours	True	225	74.0	121	57.3
	False	79	26	90	42.7
Utilization of Personal Protective devices such as ear plugs and ear muffs cannot protect one from generator noise	True	27	8.9	8.1	17
	False	277	91.1	91.9	153
Exposure to noise from electric generator can cause sleeplessness	True	46	15.1	33.6	71
	False	258	84.8	140	66.4
Utilization of Personal Protective devices such as ear plugs and ear muffs can protect one from generator noise	True	252	82.9	183	86.7
	False	52	17.1	28	13.3

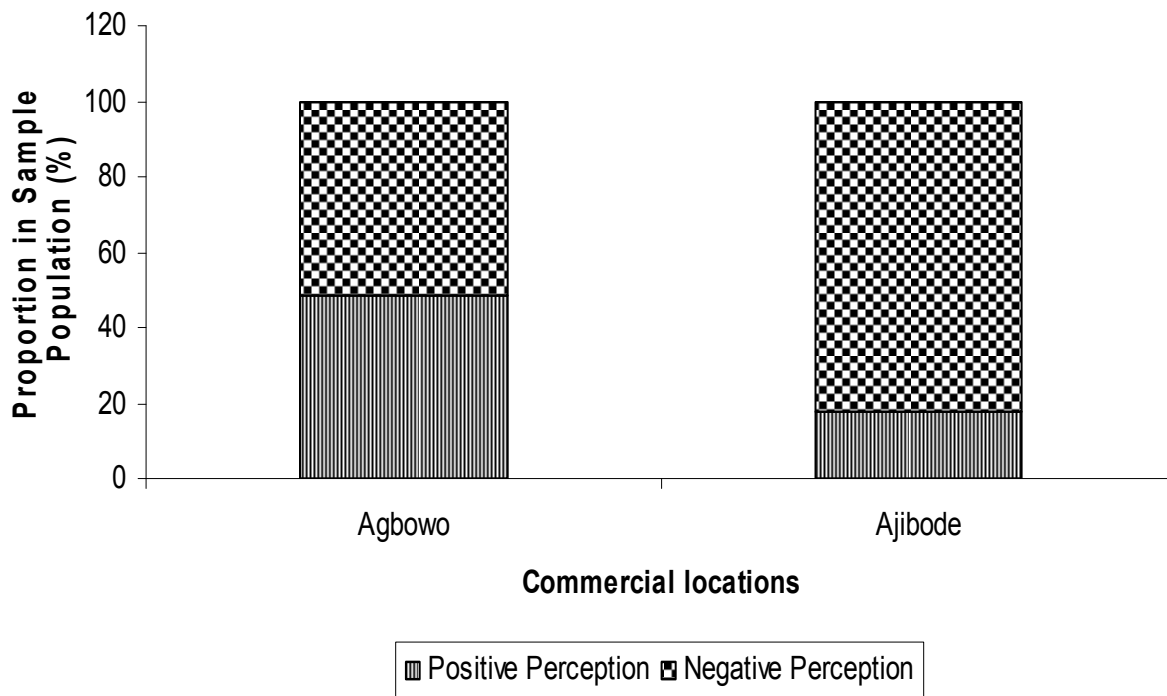


**Figure 2:** Proportion of respondents with Good and Poor knowledge in Relation to Noise associated with Generator Use in Agbowo and Ajibode locations

**Table 3:** Perception of risk associated with exposure to generator noise

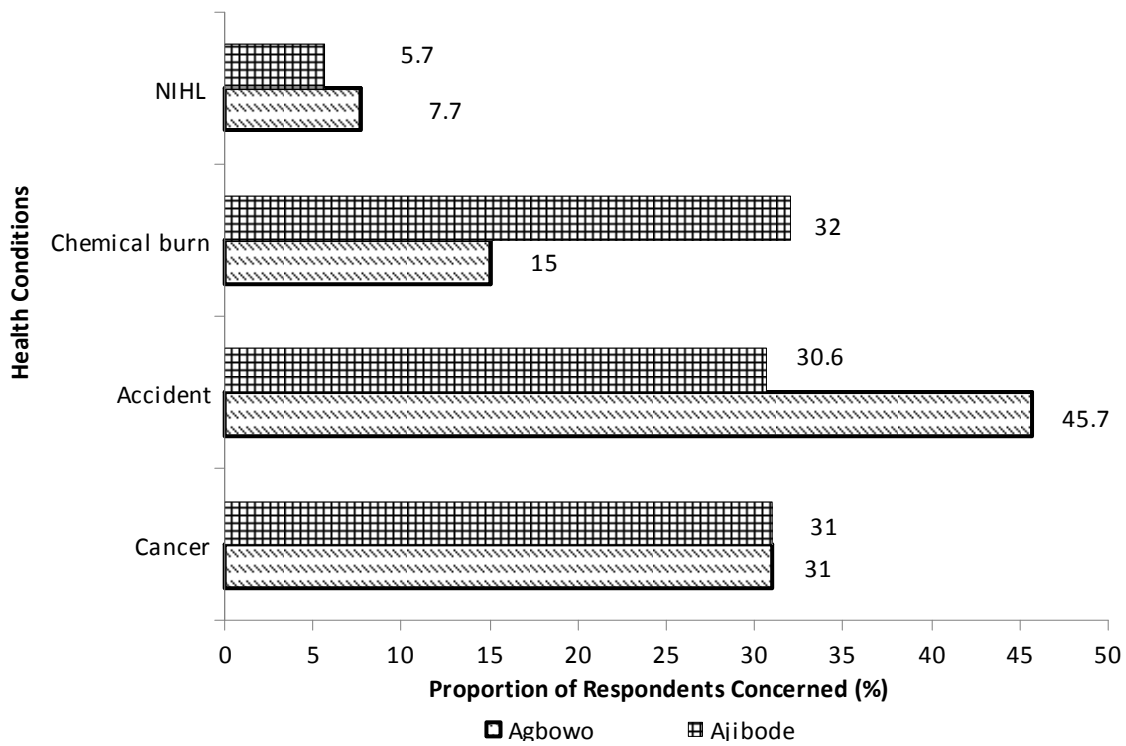
Variable	Options	Agbowo		Ajibode	
		N	%	N	%
Noise at workplace is a major contributor to a worker's loss of quality of life	Agree	200	65.8	157	74.4
	Indifferent	40	13.2	22	10.4
	Disagree	64	21.1	32	15.2
It is considered a major disability to lose one's hearing capacity	Agree	254	83.6	166	78.7
	Indifferent	25	8.2	21	10.0
	Disagree	25	8.2	24	11.4
Exposure to high levels of noise from an electric generator can cause hearing disability	Agree	239	78.6	192	91.0
	Indifferent	29	9.5	7	3.3
	Disagree	36	11.8	12	5.7
A business operator's chance of developing hearing disability from this workplace is very low	Agree	83	27.3	123	58.3
	Indifferent	78	25.7	35	16.6
	Disagree	143	47.0	53	25.1

Despite the hazards associated with the use of electric generators, it is a blessing to mankind	Agree	132	43.4	76	36.0
	Indifferent	57	18.8	90	42.7
	Disagree	115	37.8	45	21.3
It is not necessary to reduce the noise from electric generators	Agree	65	21.4	64	30.3
	Indifferent	35	11.5	38	18.0
	Disagree	204	67.1	109	51.7



**Figure 3:** Proportion of respondents with positive and negative perception in relation to Noise Associated with Generator Use in Agbowo and Ajibode locations





**Figure 4:** Perceived severity NIHL in comparison with other health conditions at Agbowo and Ajibode commercial areas