Levels and Trends in Households Source of Cooking Fuel in Nigeria: Implications on Under-five Mortality

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ABSTRACT

Background

Studies have shown that characteristics present in the neighborhood where children are raised might likely influence the mortality risks of such children. Cooking fuel can be regarded as one of the environmental factors determined by the socioeconomic background of the household, but the nexus between this and the health outcome of under-five children had received little or no attention.

Objective

Therefore, this study seeks to examine the levels and trends of source of cooking fuels among households in Nigeria as implied on under-five mortality.

Methods

The data used was the Nigeria Demographic and Health Survey (NDHS)-Child Recode file of 2003, 2008 and 2013. The method of analysis used was the descriptive approach which includes cross tabulation, charts and tables.

Results

The percentage of U-5 children who lived in homes where wood was used as cooking fuel still lies above 80 percent. The poorest and the poorer have the highest percentage among the households that used wood and agric. crop/dung for cooking.

Conclusion

Environmental factor such as type of cooking fuel is still been influenced by socioeconomic status of the households where the child lives, some of which includes wealth status and place of residence as discussed in the result. The study found that there has not been major improvement in the source of cooking fuel in households where under-five children are raised and this contribute in determining their health outcomes.

Keywords: Cooking fuel, Under-five mortality, Households, Nigeria, Environment, Levels and Trends

Short /Running Title: Cooking fuel and U-5 Mortality

Background

Studies have shown that characteristics present in the neighborhood where children are raised might likely influence the mortality risks of such children (Antai, 2011; Adedini, 2013). For example, children raised in economically and socially deprived communities might be more exposed to the risk of under-five mortality compared to those in developed communities (Adedini, 2013). Poverty makes children from less privilege households vulnerable to inadequate water, poor sanitation, air pollution, undernourishment, etc., which are some of the risks of mortality unlike those who were born to better off families. As a result of this exposure, they suffer diverse diseases (Adepoju, Akanni and Falusi, 2012; Policy project/Nigeria, 2002; UNICEF, 2010).

Cooking fuel can be regarded as of one of the environmental factors determined by the socioeconomic background of the household (Mosley and Chen, 1984; Olisaekee, 2014, Uthman, 2007).The nexus between type of cooking fuel and the health of humans had in most cases received little or no attention. According to Horton (2007), even international organizations such as World Health Organization (WHO) and the World Bank have not really researched this area. Type of cooking fuel used in the household where the under-five children are raised played a major role in determining their health outcomes. For example, the location of the kitchen in the household might generate indoor pollution which might contaminate the air these children breath (Mestl, Aunan, Seip, Wang, Zhao and Zhang, 2007). In some instances households might use two or three types of cooking fuel with varying level of risk due to non-affordability or accessibility of one.

Indoor air pollution (IAP) emanating from burning solid fuels (wood, charcoal, animal dung, coal and crop waste) for cooking and home heating remains a major environmental and public health challenge in developing countries. Worldwide, approximately 4.3 million people have died as a

result of illnesses attributed to IAP; these deaths include 534,000 children who are under-five in age. Most of the deaths occur in low- and middle-income countries, including Nigeria. Children under-five years of age are one of the vulnerable groups most likely to experience ill health caused by solid fuel use, as they are with their mothers while they are cooking (Ezeh, Agho, Dibley, Hall and Page, 2014).

In Nigeria, more than 70 percent of this households depend on solid fuels for cooking which exposed their children to emissions of harmful biomass smoke (Olisakee, 2014; National Population Commission (NPC) [Nigeria] & ICF International, 2014). The culture of most ethnic groups in the country require that the mother backs her infant or young child when cooking. This practice is said to significantly increase the risk of the child having acute upper or lower respiratory tract infections, asthma and pneumonia- which is the number one under-five killer disease in Nigeria (United Nations Children's Fund, 2015). Therefore, this study seeks to examine the levels and trends of source of cooking fuels among households in Nigeria as implied on under-five mortality.

Materials and Methods

The data used were from the Nigeria Demographic and Health Survey (NDHS)-Child Recode file of 2003, 2008 and 2013. It was a national representative sample of 6029, 28647 and 31482 children out which 843, 3201 and 2886 were reported dead as at the time of the survey. The method of analysis used in this study was the descriptive approach through the use of cross tabulation, charts and tables. The socioeconomic variables used includes; place of residence and wealth status, while the environmental factor considered was source of cooking fuel and the outcome variable is under-five mortality.

Results

Figure 1, shows the trend in under-five deaths in rates within the period of 2003-2013. In 2003, out of every 1,000 under-five children reported in the survey 185 were reported dead, while 162 and 128 were reported dead in 2008 and 2013. The result established that there was a decline of 31 percent in under-five mortality within the 10 years period.

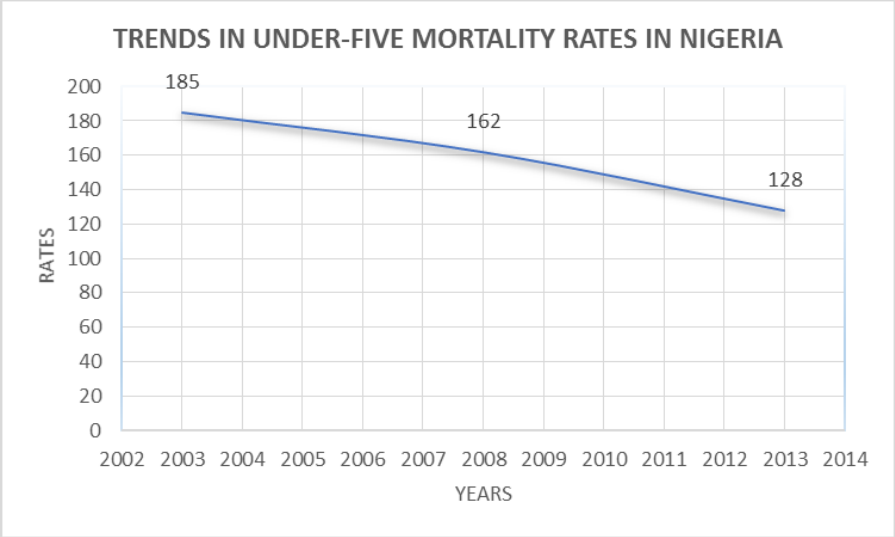

Table 1, shows the percentage distribution of type of cooking fuel among households where the under-five children lives in Nigeria. The result shows that in 2003, 81.4 percent of the households where the children lives used wood/charcoal/coal as cooking fuel, while 17.3 percent and only 1.0 percent lived in homes where kerosene and electricity/gas were used for cooking respectively. Further, in 2008, 86.3 percent of the children lived in households where firewood/charcoal/coal were used for cooking, while 12.7 percent and 0.9 percent lived in homes where kerosene and electricity/gas were used as cooking fuel. Finally, in 2013 the percentage of those who lived in homes where wood is used as cooking still lies above 80 percent, but there was a little increase in the number of those who used electricity/gas (1.6 percent, when compared to 0.9 percent in 2008

and 1.0 percent in 2003), while 15.7 percent resides in homes where kerosene was used as cooking fuel.

Table 1:Percentage Distribution of Type of Cooking Fuel among Households in Nigeria

Cooking Fuel	2003	2008	2013
Agric. crop/dung	0.4	0.2	0.4
Wood/Charcoal/Coal	81.4	86.3	82.3
Kerosene	17.3	12.7	15.7
Electricity/Gas	1	0.9	1.6

Source: Authors' Compilation, 2016

Table 2, shows the percentage distribution of type of cooking fuel by under-five deaths. In 2003, 88.6 percent of under-five children who died lived in homes where firewood was used as cooking fuel and 10.6 percent lived where kerosene was used as cooking fuel. In 2008, 91.5 percent of children who died were reported to live in homes where fire wood was used as cooking, while 7.9 percent lived where kerosene was used as cooking fuel. Lastly, in 2013 the percentage of children who died and lived in homes where wood and kerosene were used for cooking were 88.8 percent and 9.7 percent respectively.

Table 2: Percentage Distribution of type of Cooking fuel by Under-five Deaths in Nigeria

Cooking fuel	2003	2008	2013
Agric. Crop/dung	0.5	0.2	0.6
Wood/Charcoal/Coal	88.6	91.5	88.8
Kerosene	10.6	7.9	9.7
Electricity/Gas	0.4	0.4	0.9

Source: Authors' Compilation, 2016

Table 3, shows the percentage distribution of type of cooking fuel by the wealth index of the household where the under-five children lives. In 2003 the result shows that only the richer and richest households were able to use electricity or gas for cooking (3.5 percent and 96.5 percent respectively). While 2.8 percent, 23.2 percent and 74.0 percent of households classified as middle, richer and richest were able to use kerosene for cooking. About 28.6 percent, 26.8 percent, 23.4

percent and 18.3 percent of poorest, poorer, middle and richer households where the under-five lives used firewood for cooking. Only 2.9 of richest homes used wood/charcoal/coal for cooking. Lastly, 40.0 percent and 32.0 percent of poorest and poorer households used agric. crop/dung for cooking, while 16.0 percent, 8.0 percent and 4.0 percent of middle, richer and richest households used this as cooking fuel.

In 2008, the result shows that about 63.2 percent, 22.4 percent and 12.0 percent of the poorest and poorer households used agric. crop/dung, while 27.2 percent 28.5 percent, 23.3 percent and 16.9 percent of poorest, poorer, middle and richer households used wood/ charcoal/coal for cooking. It was observed that more of the richer and richest households used kerosene and electricity/gas for cooking. In 2013, none of the richest home used agricultural crop/dung for cooking 96.3 percent and 67.7 used electricity/gas and kerosene for cooking respectively. The poorest and the poorer have the highest percentage among the households that used wood and agric. crop/dung for cooking.

Table 3: Percentage Distribution of type of Cooking fuel by Wealth Index in Nigeria

			2003		
Cooking fuel	**Poorest**	**Poorer**	**Middle**	**Richer**	**Richest**
Agric. Crop/dung	40.0	32.0	16.0	8.0	4.0
Wood/Charcoal/Coal	28.6	26.8	23.4	18.3	2.9
Kerosene	0.0	0.0	2.8	23.2	74.0
Electricity/Gas	0.0	0.0	0.0	3.5	96.5
			2008		
Cooking fuel	**Poorest**	**Poorer**	**Middle**	**Richer**	**Richest**
Agric. Crop/dung	34.9	46.5	18.6	0.0	0.0
Wood/Charcoal/Coal	30.8	27.7	21.9	15.6	4.0
Kerosene	0.0	0.4	4.6	24.3	70.7
Electricity/Gas	0.0	0.0	0.4	4.4	95.2
			2013		
Cooking fuel	**Poorest**	**Poorer**	**Middle**	**Richer**	**Richest**
Agric. Crop/dung	63.2	22.4	12.0	2.4	0.0
Wood/Charcoal/Coal	27.2	28.5	23.3	16.9	4.2
Kerosene	0.1	0.1	3.8	28.3	67.7
Electricity/Gas	0.0	0.0	0.6	3.1	96.3

Source: Authors' Compilation, 2016

Table 4, shows the percentage distribution of type of cooking fuel by place of residence of the under-five children. In 2003, about 88.8 percent and 73.6 percent of the households in rural area used agric. crop/dung and wood/charcoal/coal for cooking, while only 12.0 percent who lived in the urban used such for cooking. Further, 74.2 percent and 80.7 percent of households in the urban centers used kerosene and electricity/gas for cooking.

In 2008, similar to the pattern observed for 2003, more than 80.0 percent of the households in the rural areas used agric. crop/dung and wood/charcoal/coal for cooking, while about 77.7 percent and 82.7 percent of those in the urban centers used kerosene and electricity/gas for cooking. Similar pattern was experienced in 2013.

Table 4: Percentage Distribution of type of Cooking fuel by Residence in Nigeria

	2003		2008		2013	
Cooking fuel	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**
Agric. Crop/dung	12.0	88.8	11.6	88.4	11.2	88.8
Wood/Charcoal/Coal	26.4	73.6	19.5	80.5	23.4	76.6
Kerosene	74.2	25.8	70.9	29.1	77.7	22.3
Electricity/Gas	80.7	19.3	83.6	16.4	82.7	17.3

Source: Authors' Compilation, 2016

Discussion and Conclusion

It can be concluded from the result that more than 80 percent of the households where under-five children lives used wood/charcoal/coal as cooking fuel. Which might expose the children to the emission of biomass smoke. This might partly explain the reason for high prevalence rate of acute respiratory infection (ARI) which leads to pneumonia among under-five children in Nigeria (National Bureau of Statistics, 2014; NPC and ICF Macro, 2014). There has not been major improvement in the source of cooking fuel in households where under-five children are raised and this contribute in determining their health outcomes (Olisakee, 2014). Environmental factor such

as type of cooking fuel is influenced by socioeconomic status of the households where the child lives, some of which includes wealth status and place of residence as discussed in the result. There is need for urgent attention, particularly in improving the standard of living of care-givers of the under-five children (their parents) so as to achieve the goal 3 as stated in the newly approved Sustainable Developmental Goals.

Also, cooking fuel such as electricity and gas should be made affordable and accessible to households. According to Mestl, Aunan, Seip, Wang, Zhao and Zhang, 2007, households sometimes combined mixture of two or three source of cooking fuel which has varying degree of risk, due to the fact that they are unable to afford the cost of the previous or access it for purchase.

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