Urban Deprivation Factors, Maternal index and under-5 mortality in sub-Saharan Africa: Evidence from 5 West African Demographic and Health Surveys.

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Abstract

The paper examined critical issues of urban context in terms of inequity as it relates to health outcomes of children. This is with a view to understand issues around variations in standards of living within urban settings and its implications for under-5 mortality (U5MR). Specifically, we examined the influence of urban deprivation index, mothers' status index on under-5 mortality in West Africa.

We analyzed DHS dataset for five countries in West Africa collected within the last five years. The association of urban deprivation and maternal status with all-cause under-5 mortality was assessed using bivariate (chi-square) analysis and Cox proportional hazards regression. Children who were alive at the time of the interview were right censored. All independent factors were included in a single model as categorical variables. Separate models were fitted for each country and the measures of association were expressed as hazard ratios and the corresponding 95% confidence intervals.

Across all the five country, place of delivery and postnatal visit[1] were consistently significant in predicting U5MR with a lower relative risk for those who delivered in either in private or public hospitals. Urban deprivation index was significant across the countries (except in Ghana) with a consistent pattern of lower relative risk among those least deprived. Maternal status index and household wealth tertile were only significant predictors in Nigeria with lower relative risk among those with high maternal status index and those in rich category. Age of mothers was also significant across the country (except in Ghana) with a higher relative risk among younger women.

[1] Except in Benin where there is no data for this.

Background:

Health indicators in many African countries still reflect a very challenging picture compared with those of other regions of the world. One of the major indices for health comparability is child health outcome and this is directly related to achieving the desired Millennium Development Goal4 (MDG4). Africa accounted for about 5million of the global 9.7 million child mortality in 2008. The under-five mortality (U5MR) rates across the countries according to Demographic and Health Surveys conducted between 1990s and 2008 varied between 93 in Cameroon to over 300 in Niger per 1,000 live-births with rural-urban differential of between 27 deaths per 1,000 live births in Kenya to 85 in Senegal. Whereas the statistics confirmed rural-urban disparity in favour of urban settings in the estimates of U5MR across the region, the situation in the urban areas is yet far below acceptable benchmark. Previous studies on rural-urban burden of U5MR mortality using household and community level characteristics[1] confirmed these wide variations.

Africa countries are currently witnessing a rapid urbanization process. This coupled with the unprecedented rural-urban migration have resulted into a surge of urban population as well as a growing urban slums. Many of these slums are generally characterized by lack of basic facilities. The rural-urban dichotomy usually adopted in many analysis concealed evidence in many of these urban areas. It is important therefore to understand issues around deprivation and vulnerability in the context of urban settings. Poverty is associated with increased likelihood of mortality among children. With increasing urbanization and the growing population of the urban poor, it is important to examine the linkage between urban deprivation and childhood mortality in sub-Saharan Africa.

Increasing trend in U5MR mortality in some urban areas in African have been documented [2]. The World Health Organization (WHO) 2008 estimates confirmed that U5M rates in urban areas in some countries in sub-Sahara Africa have witnessed between 3% to 15 percent increase in the rates. Many of the reasons for these have been established which include overcrowding [3], maternal knowledge [4], place of birth, mother's education and region[5]& [6], and biosocial factors including living environment [7]. Studies have also been able to link urban growth in Africa to high under five mortality[8]. Some others have also focus on individual variables of birth order and sex of child[9] as well as households wealth status[10, 11] to explain urban U5MR situation.

Although these studies have been able to establish in part some factors that may explain vulnerability of children to forces of death in urban centres, many of these have only be able to focus on isolated variables or countries. Also, there are wide variations in measurements of concepts in some of the analysis. For instance, what constitute overcrowding in some urban areas may differ and highly subjective. Urban settings in some real sense in many African countries are not homogenous and the growing urban slums make it difficult to view

urban areas as a uniform concept. Accessibility to basic social and health facilities among residents in urban areas may not be equitable. Also, individual characteristics of women as well as that of children may yield different outcome irrespective of common denominators. Sub-regions in the continents also shared common socio-cultural bonds and heritage which may be different from what obtained in other sub-regions. In order to overcome these, we proposed the computation of indices that provides a more uniform basis for capturing both environmental factors in terms of urban deprivation as well as maternal status index to provide a broad categorization of women.

The current article therefore, is to improve on conceptual measurement and also focus on a sub-region with similar or common denominator in terms of socio-cultural factors. The aim of the current article among others is to examine the effects of urban deprivation and maternal indices as well as selected individual variables as determinants of U5MR in selected countries in West Africa region.

Methods

This paper utilized cross-sectional data from the most recent (as of March 2011) Demographic and Health Surveys (DHS) for five West African countries with high U5MR, namely: Nigeria (2008), Benin (2006), Ghana (2008), Liberia (2007) and Sierra Leone (2008). The DHS are nationally-representative household surveys which collect demographic, health and socio-economic data. Birth histories and mortality data for individual children are collected from women aged 15-49 years. The detailed methods used in the respective country surveys are provided in the final DHS reports [12-16]. The study was restricted to children born within the last 5 years to mothers resident in urban areas at the time of interview.

Outcome Variable:

The outcome variable in this study was the probability of a child dying between birth and age 5. Cases of mortality were included only where the children were less than 59 months and resident in an urban area. The U5M estimates were published in DHS reports for each of these countries and our computed values for the countries conform with the published estimates.

Explanatory Variables:

Three broad explanatory variables were computed.

1. Urban Deprivation Index:

Urban household deprivation index was determined based on a set of key variables that reflect socio-economic deprivation at the household level. These include whether or not the household; a) utilized a non-polluting cooking fuel, b) relied on electricity, c) utilized a flush toilet, and d) had access to piped water. An urban

household without these amenities was considered as extremely deprived. A similar approach has been used in other studies to reflect urban disadvantage as a characteristic of place of residence [17, 18]. An urban deprivation index was generated using factor analysis for each household. The index was categorized into tertiles with the lowest third reflecting the most deprived urban households and the highest tertile reflecting the least deprived urban households. This variable enables investigation of how urban household deprivation is associated with under-5 mortality in a more succinct approach.

2. Maternal Status Index:

Maternal status was assessed using a composite index of four variables reflecting different aspects of the status of women in households. These included whether or not the woman a) was educated at primary level or less, b) was currently working, c) decides on household spending, and d) sees wife beating as justified under any of the following circumstances: if she goes out without telling him, if she neglects the children, if she argues with him, if she refuses to have sex with him, and if she burns the food. The maternal status index was generated using factor analysis and categorized into tertiles with the lowest third reflecting women with lowest status based on the four factors. A similar index has been used to reflect the degree of maternal socio-economic deprivation in previous studies [19].

3. Individual explanatory variables:

Key explanatory variables and potential confounding factors included in the analysis were: a) mother's age, grouped as 15-20, 21-27, 28-31, and 32+ years of age; b) sex of the child; c) birth order categorized as 1, 2-3, or 4 or above; d) household wealth in tertiles; e) place of delivery, reclassified as home, public health facility or private health facility; and f) postnatal visit after 2 months. The last two variables were selected to account for the health seeking behavior of the mothers in urban areas.

Statistical Analyses:

The association of urban deprivation and maternal status with all-cause under-5 mortality was assessed using bivariate (chi-square) analysis and Cox proportional hazards regression. Children who were alive at the time of the interview were right censored. All independent factors were included in a single model as categorical variables. Separate models were fitted for each country and the measures of association were expressed as hazard ratios and the corresponding 95% confidence intervals.

Findings

Background Characteristics of Mothers across five countries in West Africa

The analysis covered women with at least a birth less than years at the time of the survey. Table 1 presents the background information of women that are considered important for the analysis. About 22 percent of mothers in Nigeria were aged 27 years or below compared with 18 percent in Ghana, 21 percent in Benin, 20 percent in Liberia and 25 percent in Sierra Leone. By urban deprivation index, more than half of all women sampled in each of the country were in the upper tertile of most deprived with the highest in Liberia (65%) and lowest in Sierra Leone (50%). Slightly over one-fifth of women in Nigeria, one-fourth in Ghana, about one-third in Benin and around two-fifth in Liberia and Sierra Leone were categorized as high maternal status. More than half of women in Benin, more than three-fifth of women in Nigeria (65%), Ghana (65%) and Liberia, and four-fifth (82%) in Sierra-Leone of women sampled were in upper rich wealth tertile. The bulk of the respondents (69-86%) of women delivered the reference birth at home while less than 10 percent across the countries went for post-natal check for the reference birth.

(Table 1 about here)

Characteristics of under-5 children and U5MR across five countries in West Africa

The characteristics of all children less than five years of age covered were as presented in table 2 below. The sex distribution was quite close across the five countries with fewer proportions of male children than females. The bulk of the children were in the 4th or more birth order which represent more than 70 percent in Nigeria and Benin, over 65 percent in Liberia and Sierra Leone and 58 percent in Ghana. National U5M is lowest in Ghana with 80 deaths per 1,000 live births and highest in Nigeria with 157 deaths per 1,000 live births. The rate is highest for urban dwellers in Sierra Leone (167 per 1,000 live births), followed by Liberia (131 per 1,000 live births) and lowest in Ghana (75 per 1,000 live births).

(Table 2 about here)

Cross-tabulation and Chi-square test of under-5 mortality by covariates

Table 3 below presents the cross-tabulation and chi square tests of U5MR by covariates of interest. Four of the variables showed statistically significant association ($p<.05$) with U5MR across the five countries. Across the five countries, mothers' age showed statistical significance ($p<.05$) with under-5 deaths with highest proportion among women 32 years and above. Sex of the child was significant ($p<.05$) in Nigeria, Ghana, Liberia ad Sierra Leone. The proportion is higher among male children than female children with the highest variance in Ghana (10.2% of male and 6.7% of female) and a negligible difference in Benin (11.8% of male and 11.5% of female). Birth order was also statistically significant ($p<.05$) across the five countries with the highest proportion among

fourth or more birth order, followed by those in 2nd or 3rd birth order with the least among first birth. Urban deprivation index was significant (p<.05) for all except Ghana. The distribution by urban deprivation index was not consistent across the five countries, whereas the highest proportion of U5MR was among the most deprived in Nigeria (15.3%) and Benin (13.6%), it was highest among the mid-deprived class in Sierra Leone (17%), Liberia (20%) and Ghana (9.1%). Maternal status index was significant (p<.05) across the country except in Liberia. The distribution did not show a regular pattern but the highest proportion of U5MR is among those in the average category in Nigeria (14.4%), Benin (14.3%) and Sierra Leone (18.8%) and among those in low maternal status in Ghana (10.6%). Place of delivery was significant (p<.05) across the five countries and U5MR was highest among those who delivered at home. Postnatal check after 2 months was significant (p<.05) across the five countries with the bulk of U5MR among those who did not go for postnatal check two months after births.

(Table 3 about here)

Hazard Ratios linking urban deprivation, sex of child and maternal status index to under-5 mortality.

Hazard ratio is an estimate of the relative risk of a terminal event like death. Hazard ratio was fitted for each country independently. For Nigeria, 8 categorical variables were statistically significant (p<.05) in predicting the relative risk of U5MR. These significant categorical variables include age of mothers (28-31 years and 32 years and above), urban deprivation index (least deprived), maternal status index (high), household wealth tertile (rich), place of delivery (public and private facilities), and postnatal check two months after birth (yes). The relative risk for the significant categorical variable showed that those U5MR has a lower relative risk with two categories of older ages (*C.I-0.42-0.88; 0.23-0.46*), higher among those most deprived class (*C.I-0.64-0.88),* with low maternal status (*C.I-0.67-0.95)* who are poor (*C.I-0.68-0.90),* who delivered at home and without recourse to postnatal check up two months after birth. In Ghana, only three categorical variables related to place of delivery and postnatal check after birth were statistically significant (p<.05) in predicting U5MR. The relative hazard risk of the significant variables showed that the relative risk for those who delivered at home was higher compared with those who delivered in public facility (0.37: C.I-0.23-0.59), and those who delivered in private facility (0.64: C.I-0.31-1.33).

Six categorical variables were significant predictors (p<.05) of U5MR in Benin. These include the three age groups categories, the least urban deprived, and place of delivery either public or private. The relative risk of the significant variables showed that the relative risk of U5MR reduces with increasing age, lower among the lowest urban deprived (C.I-0.43-0.94), and lower among those who delivered in the public (0.39) and lowest for

those who delivered in private facilities (0.34). The situation of statistical variables in Liberia is similar to Benin. The relative risk decreases with older ages, lower for the least urban deprived category, lower for those who delivered in either public or private facilities and also lower for those who sent for postnatal check up. Five categorical variables were statistically significant ($p<0.05$) in predicting U5MR in Sierra Leone. These include mother's age (32 years or more), urban derivation index (least deprived), place of delivery and postnatal visit.

Discussion and Conclusion

Across all the five country, place of delivery and postnatal visit[2] were consistently significant in predicting U5MR with a lower relative risk for those who delivered in either in private or public hospitals. Urban deprivation index was significant across the countries (except in Ghana) with a consistent pattern of lower relative risk among those least deprived. Maternal status index and household wealth tertile were only significant predictors in Nigeria with lower relative risk among those with high maternal status index and those in rich category. Age of mothers was also significant across the country (except in Ghana) with a higher relative risk among younger women.

The analysis confirmed that urban deprivation index is an important predictor of U5MR in the region. Many urban slums in African are characterized with poor access to basic infrastructure and social amenities. This may have a direct impact on poor health outcomes in many of these places. This confirms previous findings on the linkages between environmental factors and health outcomes (17, 19). This also explains in part issues around place of delivery which in some cases may not be easily accessible to poor urban dwellers. Another major issue arising from this analysis is on the linkages between age of mothers and U5MR. Maternal status index showed mixed results in predicting U5MR. Children to mothers of younger ages have a higher relative risk of dying compared with those of older ages. Adolescent and pre-marital fertility rate in sub-Sahara Africa is on the increase which may have direct negative consequences on the health and survival of the children. This also confirmed results of previous studies (6,8).

The study concluded that although wide variations exits rural-urban estimates of child mortality, variations within the urban context also varied largely due to issues of urban deprivation. In order to improve on child health indicators in Africa, urban disadvantaged groups constitute a major group of interest that required appropriate intervention.

[2] Except in Benin where there is no data for this.

References

1. Van de Poel, E., O. O'Donnell, and E. Van Doorslaer, *What explains the rural-urban gap in infant mortality: household or community characteristics?* Demography, 2009. **46**(4): p. 827-50.
2. Houweling, T.A., et al., *Rising under-5 mortality in Africa: who bears the brunt?* Trop Med Int Health, 2006. **11**(8): p. 1218-27.
3. Aaby, P., et al., *Overcrowding and intensive exposure as determinants of measles mortality.* Am J Epidemiol, 1984. **120**(1): p. 49-63.
4. Abalkhail, B., A.A. Bahnassy, and H. Al Abasi, *Maternal knowledge, attitudes, and practices as predictors of diarrboeal disease in Saudi children < 3 years of age.* J Egypt Public Health Assoc, 1995. **70**(5-6): p. 559-77.
5. Adetunji, J.A., *Infant mortality in Nigeria: effects of place of birth, mother's education and region of residence.* J Biosoc Sci, 1994. **26**(4): p. 469-77.
6. Ahmad, O.B., I.W. Eberstein, and D.F. Sly, *Proximate determinants of child mortality in Liberia.* J Biosoc Sci, 1991. **23**(3): p. 313-26.
7. Andoh, S.Y., et al., *Association of household demographic variables with child mortality in Cote d'Ivoire.* J Biosoc Sci, 2007. **39**(2): p. 257-65.
8. Antai, D. and T. Moradi, *Urban area disadvantage and under-5 mortality in Nigeria: the effect of rapid urbanization.* Environ Health Perspect. **118**(6): p. 877-83.
9. Ayiko, R., D. Antai, and A. Kulane, *Trends and determinants of under-five mortality in Uganda.* East Afr J Public Health, 2009. **6**(2): p. 136-40.
10. Bayasgalan, B., *Determinants of infant and child mortality in Mongolia.* Mong J Demogr, 1996. **1**(1): p. 12-26.
11. Lachaud, J.P., *Modelling determinants of child mortality and poverty in the Comoros.* Health Place, 2004. **10**(1): p. 13-42.
12. Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF Macro, *Ghana Demographic and Health Survey 2008*. 2009, Accra, Ghana: GSS, GHS, and ICF Macro.
13. Institut National de la Statistique et de l'Analyse Économique (INSAE) [Bénin] and Macro International Inc., *Enquête Démographique et de Santé (EDSB-III) - Bénin 2006*. 2007, Calverton, Maryland, USA: Institut National de la Statistique et de l'Analyse Économique et Macro International Inc.
14. Liberia Institute of Statistics and Geo-Information Services (LISGIS), et al., *Liberia Demographic and Health Survey 2007*. 2008, Monrovia, Liberia: Liberia Institute of Statistics and Geo-Information Services (LISGIS) and Macro International Inc.
15. National Population Commission (NPC) [Nigeria] and ICF Macro, *Nigeria Demographic and Health Survey 2008*. 2009, Abuja, Nigeria: National Population Commission and ICF Macro.
16. Statistics Sierra Leone (SSL) and ICF Macro, *Sierra Leone Demographic and Health Survey 2008*. 2009, Calverton, Maryland, USA: Statistics Sierra Leone (SSL) and ICF Macro.
17. Antai, D. and T. Moradi, *Urban area disadvantage and under-5 mortality in Nigeria: the effect of rapid urbanization.* Environ Health Perspect, 2010. **118**(6): p. 877-83.
18. Macintyre, S., A. Ellaway, and S. Cummins, *Place effects on health: how can we conceptualise, operationalise and measure them?* Soc Sci Med, 2002. **55**(1): p. 125-39.
19. Uthman, O.A., *Environmental factors, neighbourhood deprivation, and under-five mortality in Nigeria: an exploratory spatial data analysis.* The Internet Journal of Pediatrics and Neonatology, 2008. **9**(1): p. Available at: http://www.ispub.com/ostia/index.php?xmlPrinter=true&xmlFilePath=journals/ijpn/vol9n1/mortality.xml.

Table 1: Background characteristics of mothers by country*

	Nigeria	Ghana	Benin	Liberia	Sierra Leone
	N=19649	N=2534	N=15391	N=7934	N=5371
Mother's age at interview					
18+	3.2	2.9	2.6	3.6	4.0
24+	18.5	15.5	18.4	16.9	21.4
28+	19.9	14.9	19.4	13.8	18.2
32+	58.5	66.8	59.6	65.7	56.4
Median age					
Urban Deprivation Index					
Class I (Most deprived)	53.4	59	51.5	65.4	50.2
Class II	18.9	18.2	42.6	8.0	21.3
Class III (Least deprived)	27.7	22.7	5.8	26.6	28.5
Maternal Status Index					
Low	37.3	42.9	34.0	47.6	26.2
Average	41.6	30.8	32.8	14.6	32.0
High	21.1	26.3	33.2	37.9	41.8
Household wealth tertile					
Poor	13.7	12.6	28.7	13.4	7.3
Middle	21.7	22.9	16.3	20.4	10.9
Rich	64.7	64.5	54.9	66.2	81.8
Place of delivery					
Home	79.4	68.5	69.9	85.6	86.1
Public facility	11.9	25.8	23.0	10.5	11.4
Private facility	8.7	5.7	7.1	3.9	2.5
Postnatal check after 2 months					
No	98.0	97.2	-	95.7	91.5
Yes	2.0	2.8	-	4.3	8.5

**This analysis is restricted to mothers resident in urban areas*

Table 2: Percentage distribution of characteristics of under-5 children and U5MR in the 5 countries

	Nigeria	Ghana	Benin	Liberia	Sierra Leone
	N=19649	N=2534	N=15391	N=7934	N=5371
Sex of child*					
Male	50.6	50.3	52.3	51.4	50.7
Female	49.4	49.7	47.7	48.6	49.3
Birth order*					
1	4.4	8.5	5.2	7.6	7.4
2-3	22.4	33.6	23.8	25.3	27.4
4+	73.2	57.9	71.0	67.1	65.2
Number of deaths*	2459	214	1799	1265	846
U5MR**	157	80	125	110	140
U5MR Urban**	121	75	116	131	167
U5MR Rural**	191	90	145	146	168

**Restricted to children in urban areas*
***U5MR: Under-5 mortality rate based on all children in country*

Table 3: Under-5 deaths by background characteristics across countries					
	Nigeria	**Ghana**	**Benin**	**Liberia**	**Sierra Leone**
	N=19649	**N=2534**	**N=15391**	**N=7934**	**N=5371**
	% (N)	**% (N)**	**% (N)**	**% (N)**	**% (N)**
Mother's age at interview					
15-20	8.9 (620)	6.8 (73)	6.7 (404)	11.1 (288)	9.4 (213)
21-27	10.7 (3628)	5.6 (392)	9.5 (2829)	13 (1342)	12.9 (1151)
28-31	11 (3916)	5.8 (377)	10.8 (2989)	15.6 (1094)	15.9 (977)
32+	13.8 (11485)	9.8 (1692)	12.8 (9169)	17 (5210)	17.2 (3030)
χ^2 (p value)	*43.9 (0.00)*	*11.4 (0.01)*	*36.4 (0.00)*	*18.0 (0.00)*	*18.3 (0.00)*
Sex of child					
Male	13.1 (9948)	10.2 (1274)	11.8 (8052)	17.6 (4078)	16.9 (2723)
Female	11.9 (9701)	6.7 (1260)	11.5 (7339)	14.2 (3856)	14.6 (2648)
χ^2 (p value)	*5.6 (0.02)*	*10.2 (0.001)*	*0.29 (0.58)*	*16.3 (0.00)*	*5.1 (0.02)*
Birth order					
1	2.5 (868)	0 (216)	1.5 (804)	7.8 (600)	5.8 (397)
2-3	6.6 (4400)	5.4 (852)	6.9 (3660)	10.4 (2009)	11.5 (1473)
4+	14.9 (14381)	11.5 (1466)	14.1 (10927)	18.9 (5325)	18.7 (3501)
χ^2 (p value)	*296.5 (0.00)*	*47.4 (0.00)*	*223.1 (0.00)*	*111.3 (0.00)*	*72.6 (0.00)*
Urban Deprivation Index					
Class I (Most deprived)	15.3 (10492)	9 (1496)	13.6 (7934)	16.5 (5190)	16.6 (2697)
Class II	11.9 (3716)	9.1 (462)	10.2 (6558)	20 (634)	17.0 (1144)
Class III (Least deprived)	7.5 (5441)	6.6 (576)	5.8 (899)	13.5 (2110)	13.3 (1530)
χ^2 (p value)	*199.7 (0.00)*	*3.3 (0.19)*	*71.5 (0.00)*	*18.6 (0.00)*	*10.0 (0.007)*
Maternal Status Index					
Low	13.2 (7331)	10.6 (1087)	10.5 (5236)	16 (3773)	16.5 (1405)
Average	14.4 (8165)	8.6 (780)	14.3 (5052)	15.2 (1155)	18.8 (1721)
High	7.7 (4153)	4.8 (667)	10.3 (5103)	16.2 (3006)	13.0 (2245)
χ^2 (p value)	*118.5 (0.00)*	*17.9 (0.00)*	*48.6 (0.00)*	*0.7 (0.69)*	*25.6 (0.00)*
Household wealth tertile					
Poor	20.3 (2690)	12.5 (320)	15.1 (4419)	15.2 (1064)	16.7 (390)
Middle	16.3 (4255)	10.7 (580)	12.6 (2516)	16.4 (1619)	16.0 (588)
Rich	9.6 (12704)	6.9 (1634)	9.6 (8456)	16 (5251)	15.6 (4393)
χ^2 (p value)	*306.9 (0.00)*	*15.9 (0.00)*	*88.8 (0.00)*	*0.6 (0.73)*	*0.31 (0.85)*
Place of delivery					
Home	14.4 (15606)	10.4 (1736)	14.4 (10755)	17.2 (6790)	17 .0 (4622)
Public facility	5.3 (2336)	3.8 (653)	5.7 (3546)	9.4 (833)	8.6 (614)
Private facility	4.9 (1708)	6.2 (145)	4.6 (1090)	6.8 (311)	4.4 (135)
χ^2 (p value)	*256.3 (0.00)*	*27.2 (0.00)*	*250.6 (0.00)*	*54.1 (0.00)*	*42.1 (0.00)*
Postnatal check after 2 months					
No	12.7 (19253)	8.7 (2462)	-	16.5 (7597)	16.8 (4914)
Yes	2.0 (396)	1.4 (72)	-	3.3 (337)	4.2 (457)
χ^2 (p value)	*40.6 (0.00)*	*3.9 (0.04)*	-	*42.2 (0.00)*	*50.6 (0.00)*

Table 4: Hazard ratios for effects of urban deprivation and maternal status on under-5 mortality by country

	Nigeria		Ghana		Benin		Liberia		Sierra Leone	
	HR	**95% CI**	**HR**	**95% CI**	**HR**	**95% CI**	**HR**	**95% CI**	**HR**	**95% CI**
Mother's age at interview										
15-20	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
21-27	0.71	0.49, 1.02	2.07	0.53, 8.15	0.43*	0.27, 0.68	0.48*	0.30, 0.79	0.73	0.37, 1.42
28-31	0.61*	0.42, 0.88	0.94	0.23, 3.89	0.40*	0.25, 0.62	0.37*	0.23, 0.61	0.61	0.31, 1.19
32+	0.33*	0.23, 0.46	0.60	0.16, 2.34	0.26*	0.16, 0.40	0.21*	0.13, 0.34	0.34*	0.17, 0.65
Sex of child										
Male	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Female	0.94	0.86, 1.04	0.80	0.54, 1.16	0.97	0.86, 1.08	0.87	0.77, 1.02	0.90	0.76, 1.06
Urban Deprivation Index										
Class I (Most deprived)	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Class II	0.96	0.83, 1.11	1.27	0.80, 2.01	0.98	0.86, 1.12	1.09	0.87, 1.36	1.07	0.88, 1.31
Class III (Least deprived)	0.75*	0.64, 0.88	0.85	0.46, 1.58	0.63*	0.43, 0.94	0.80*	0.67, 0.95	0.80*	0.65, 0.99
Maternal Status Index										
Low	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Average	0.94	0.85, 1.04	0.85	0.54, 1.32	1.25	0.69, 1.43	0.82	0.67, 1.00	1.15	0.94, 1.40
High	0.80*	0.67, 0.95	0.59	0.31, 1.13	1.00	0.86, 1.16	0.94	0.82, 1.08	0.82	0.66, 1.01
Household wealth tertile										
Poor	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Middle	0.93	0.82, 1.06	0.91	0.53, 1.57	0.91	0.78, 1.07	0.99	0.80, 1.24	0.77	0.53, 1.12
Rich	0.78*	0.68, 0.90	0.61	0.36, 1.04	0.87	0.75, 1.00	0.91	0.74, 1.11	0.90	0.66, 1.22
Place of delivery										
Home	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Public facility	0.41*	0.34, 0.50	0.37*	0.23, 0.59	0.39*	0.34, 0.46	0.46*	0.36, 0.60	0.44*	0.32, 0.59
Private facility	0.42*	0.33, 0.53	0.64*	0.31, 1.33	0.34*	0.26, 0.47	0.33*	0.21, 0.53	0.25*	0.11, 0.58
Postnatal check after 2 months										
No	1.00	-	1.00	-	-	-	1.00	-	1.00	-
Yes	0.13*	0.06, 0.25	0.11*	0.01, 0.77	-	-	0.15*	0.08, 0.28	0.20*	0.12, 0.32

***p<0.05**