Housing Correlates of Under-Five Mortality in Urban Ethiopia

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Abstract

Little studies and analysis have been undertaken to investigate the housing determinants of under-five mortality in Ethiopia. This study, therefore, explores the impacts of urban housing variables on the levels and patterns of under-five mortality in the country based on the SPSS (Statistic Package for Social Science) file of the 2005 Ethiopian Demographic and Health Survey (EDHS). This survey covered a sample of about 4,420 households/housing units of urban Ethiopia. The under-five deaths are computed for women in the age group 15-49 by subtracting the number of children living from children ever born (CEB) and established the proportion dead by dividing deaths by CEB corresponding to the categorical variables of housing structure, facilities, and household durables. The analytical techniques of the study included univariate, bivariate, and multivariate data analysis of the proportional variations of childhood mortality patterns being manifested by "bar graphs" with respect to housing situations as well as household durables. Amongst the categorical variables of the housing structures, facilities, and household durables with the highest no prevalence of under-five mortality levels are found to be the units of unconventional walls, thatched/leaf/reed roofing, animal dung flooring, shared pit latrine/use of bucket/bush, using kerosene, firewood/straw/charcoal for cooking, unconventional lighting, unprotected water supply, households with no durables.

Keywords

Housing, under-five mortality, correlates, descriptive statistics

Urbanization: A summary of the UN (United Nations) classification of urban localities comparing with the Ethiopian population census classifications of urban delineation is presented in the following table (see Table 1).

As shown in Table 1, the UN minimum size of an urban environment is 20,000 and over inhabitants, while Africa's definition is generally a minimum concentration of non-agricultural population with 2,000 and over inhabitants, similar to the pattern of Ethiopia's definition (refer to Table 1). Even with such minimum size of an urban definition, the continental level of urbanization has been very low, ranging from as low as 15% for East and 30% for

Middle African countries, with Ethiopia having had recorded about 16% as of the last 2007 population and housing census out of the total national population (United Nations Economic Commission for Africa [UNECA] 1995; Central Statistical Agency [CSA] 2007).

Paradoxically, African's urban growth rate has been

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the highest in the world, ranging from 4.5% for Southern Africa to 5.5% for East African states, giving about 5% for Ethiopia. However, Africa's urbanization is generally characterized by the formation of one or two primate cities (Addis Abeba is a typical example), which manifests various urbanization problems, including housing situations and facilities with slum/squatter settlement patterns and commonly observed overcrowded single-room houses and other conditions which have been detrimental to the health of the urban population (Sokoma 1985; Ministry of Urban Development and Housing [MUDH] 1980; Hamdan 1964).

UNDER-FIVE MORTALITY

Children of the poorest families and those whose mothers are less educated, were found to be more likely to die, though these factors still remain valid issues to the developed regions as well. In these areas, the variables which showed influencing under-five mortality levels were sex of the child, age of the mother at delivery, birth order, mother's educational level, those born to teenage mothers and poor child spacing (Obcraft and McDonald 2010; The Guardian 1990). Other factors of under-five mortality include nutritional deficiency over a long period of time, consisting of three standard indicators, namely, stunting, wasting, and underweight. These variables are strongly correlated with vulnerability to diseases, resulting in delayed physical and mental development, developing chronic diseases in later life worldwide, with the majority being in Africa and South-East Asia (UN Inter-agency Group for Child Mortality Estimation 2012).

Since the low literacy rates and education among women correlate strongly with high rates of under-five mortality, the education of women, their promotion to good working environment and good pay with adequate maternity protection, etc., are necessary factors for successful promotion of children's

nutritional status and health care. Furthermore, expansion of immunization programmes against specific pathogens, adequate nutrition, including inclusive breastfeeding for the newly born babies during the first six months of life and measures to reduce indoor air pollution are among the most important preventive measures for reducing the neonatal and childhood mortality levels (Black et al. 2013; World Health Organization [WHO]/World Bank 2004; UN Children's Fund/WHO 2004; Dherani 2008; Smith et al. 2011).

Considering the case of Ethiopia, although it is reported that the country has so far reduced under-five mortality by more than 67% as of 1990, still remains an increasing number of childhood deaths, attributable to newborn deaths (those in the first 28 days of life). For example, a study in Butajira on about 600 deaths of under-five children was carried out among a population of 28,780 and results showed that diarrhoeal disease, acute respiratory infections, pneumonia, malaria, and HIV (Human Immunodeficiency Virus)/AIDS (Acquired Immune Deficiency Syndrome) were found to be among the major probable causes of deaths (UN/Nations International Children's Emergency Fund [UNICEF] 2012; Ram 2012).

In the same vein, Kumar and File (2010) analyzed the level of under-five mortality in Ethiopia based on about 14,000 women in the age group 15-49, covered by the 2005 Ethiopian Demographic Survey and found out that the main predictors of infant and childhood were mother's education and income, birth order and to some extent, mother's age and urban/rural residence (Kumar and File 2010).

On the other hand, it was noted that political instability, recurrent emergencies and disasters, widespread extreme poverty, and some of the lowest budgetary allocations to basic social services in the developing world, like Africa, have contributed to the dismal child survival rates in these regions and that without faster progress in all regions, it will take until

Table 1. Criteria for Urban Definitions

International/UN classifications		Ethiopia's national urban classifications	
Category	Size/Class	Category	Size/Class
Proper urban	20,000+	Sub-city for census	1,000-2,000
Metropolis	50,000+	Small towns	2,000-49,999
City	100,000+	Medium	50,000-99,999
Big city	5,000,000+	Large city	100,000+
Megalopolis	10 million+	Addis Abeba	4 million+

2028 for the world (e.g., Africa) to meet the Millenium Development Goals—MDG4 target (UNICEF 2012).

In inclusion, the foregoing section tried to indicate some important causes of the components of under-five mortality levels and patterns. However, there appears a research gap on the impact of housing variables on the infant and childhood mortality conditions. The author is, therefore, motivated to consider and analyze the impact of housing variables on under-five mortality, taking urban Ethiopia as a case in the forthcoming sections of this paper.

THE SETTING UP OF THE STUDY

General Demographic Background of Ethiopia

Ethiopia has so far undertaken three modern national population and housing censuses. The first census ever taken was in 1984, followed by 1994 and 2007, respectively. A summary of the salient demographic features of the country is presented in Table 2.

In terms of population size, the country stands second to Nigeria in the African continent. As indicated in the table, Ethiopia is demographically typical of the developing societies, characterized by low level of urbanization, high population growth, high fertility level, and low life expectancy at birth which reflects the prevalence of high mortality level which underlies high infant and childhood mortality conditions. Assuming a growth rate of 2.6%, the

population of the country could double in a matter of about every 27 years. This means that the population of Ethiopia would be about 147.6 million by the year 2031 and this calls for all demographic, environmental, social, and economic developmental efforts and relevant policy actions to accelerate in order to keep pace with the projected rapid population growth.

Levels of Early Childhood Mortality

Mortality levels. The components of the under-five mortality are Neonatal (NN), Post-Neonatal (PNN), Infant and childhood mortality levels, defined as shown in the notes¹. Table 3 summarizes the early childhood mortality levels, showing that the infant mortality rate was 59 per 1,000 live births and the under-five mortality rate was 88 per 1,000 live births. This implies that one in every 17 Ethiopian children dies before their first birthday and one in every 11 Ethiopian children dies before celebrating their fifth birthday, implying that there needs high health development efforts in the country.

Rationale/Justification, Objectives, and Problem Statement of the Study

Rationale. Little in-depth studies and analysis have been done on the housing determinants of infant and childhood mortality, despite the fact that the country has collected enough empirical housing data from the previous three national population and housing censuses and three Demographic and Health Surveys

Table 2. Summary of Basic Demographic Indicators of Ethiopia

Major demographic variables	Basic demographic indicators corresponding to census dates		
	1984	1994	2007
Population (million)	42.6	53.5	73.8
Level of urbanization (%)	11.4	13.7	16.1
Pop growth rate (%)	3.1	2.9	2.6
Total Fertility Rate (TFR)	6.5	6.0	5.5
Life expectancy			
Male	51.1	50.9	56.3
Female	53.4	53.5	58.5
Sex ratio at birth	104.0	103.0	103.0

Note: Sources: Compiled from the 1984, 1994, and 2007 Population and Housing Census Reports.

Table 3. Early Childhood Mortality Levels (Ethiopia Demographic and Health Surveys 2000-2011)

Years preceding survey (2011)	Early childhood mortality rates				
	Neonatal mortality (NN)	Post-neonatal mortality (PNN)	Infant mortality (_{1q0})	Childhood mortality (_{4q1})	Under-five (_{5q0})
0-4	37	22	59	31	88
5-9	48	40	88	49	133
10-14	54	47	101	72	166
DHS years	NN	PNN	Infant	Childhood	Under-five
2000	49	48	97	77	166
2005	39	38	77	50	123
2011	37	22	59	31	88

Note: Sources: Compiled from the 2000, 2005, and 2011 EDHS (Ethiopian Demographic and Health Survey) Programmes.

(DHS). The focus of this paper is, therefore, unique in the sense that examinations of the variations of childhood mortality are going to be explored in the urban structure of Ethiopia with respect to housing characteristics, namely, housing structure/situation, facilities, and household durables using the SPSS (Statistic Package for Social Science) Data files of 2005 EDHS (Ethiopian Demographic and Health Survey), which covered, among other data of interest, a sample of about 4,400 households/housing units.

Objectives. The main objective of the study included is to indicate to urban planners in general and other bodies to be engaged in housing design and

construction in particular to take note of the effect of housing on mortality conditions, with particular attention to under-five mortality conditions.

Problem statement. There had been persistent high mortality conditions in Sub-Saharan Africa in general and Ethiopia in particular and this trend could be conjectured to continue for some decades before coming down to acceptable levels. The main reasons could be noted to be largely due to the widespread poverty conditions and low level of health services in urban/rural Sub-Saharan Africa. In particular, it had been apparent that persistently high infant mortality induces high fertility level, for women tend to increase their fertility performance in order to compensate the

loss of high infant mortality, which is termed as “replacement effects”.

The reciprocal relationship between high infant mortality and high fertility levels has been such that fertility tends to be superior to the level of infant mortality and follows by relatively high survivors which results in again having a youthful population, leading to high dependency ratio (burden) on the productive segment of the population. Eventually, the increase in the reproductive segments of the population as well as producing high growth potentials, would subsequently result in significant detrimental effects on developmental endeavours, aggravating poverty with concomitant effect on health service provisions with concomitant effects on levels of childhood mortality.

The General Conceptual Framework and Analytical Techniques

Housing conditions are covariates of the level of living conditions which influence the status of mortality in general and infant and childhood mortality in particular. A simplified general conceptual approach is hereby presented in Figure 1, manifesting the complex reciprocal interaction among socio-economic, housing, and demographic variables. In-built in the central framework is the infant and childhood mortality box being affected by socio-economic and demographic factors through housing variables. In this connection, Moni Nag (1988) provided detail components of analytical framework of factors affecting neonatal, post-neonatal, and infant deaths such as the demographic (e.g., maternal age), socio-economic (e.g., mother's education), environmental sanitation and personal hygiene (e.g., housing condition), nutritional availability (e.g., mother's caloric food intake), and medical care, inclusive of prenatal care, neonatal and post-neonatal immunization (Nag 1988).

With respect to analytical methods, this paper considers three stages: (1) univariate; (2) bivariate;

and (3) multivariate data analysis. Simple descriptive and proportionality of variation among the categories of each housing characteristic (e.g., type of floor, toilet facility, etc.) with respect to relative infant and childhood mortality level be applied where the univariate and bivariate analysis would deal with the types, levels, and characteristics of urban services, whereas the latter would focus on the housing determinants of infant and childhood mortality levels and patterns. From the analysis, we would be able to identify the most critical categorical variables of the housing situations, housing facilities, and household service durables which would likely appear to influence under-five mortality.

COMPILATION AND CONSTRUCTION OF DATA AND ANALYSIS

In order to keep abreast with timely data requirements for short- and long-term development planning, the Central Statistical Agency (CSA) of Ethiopia has been conducting series of demographic sample surveys in order to fill the intercensal gaps in population composition and population dynamics. Among the demographic sample surveys, include conducting series of DHS with special reference to the incidence and prevalence of HIV/AIDS pandemic and other opportunistic diseases such as Sexually Transmitted Infections (STIs), Tuberculosis (TB), and other non-HIV infectious diseases. The source of data of the analytical study is the SPSS data file of the 2005 EDHS.

The output of this survey is found to be unique from other EDHS in that it covered about 14,000 women in the productive and reproductive age segment of 15-49, rural and all classifications of urban setting in the country with corresponding data on children ever born (CEB) and surviving for each woman in the age group 15-49.

From the retrospective data of CEB and surviving,

Figure 1. Conceptual Framework Manifesting the Antecedent and Proximate Determinant of Infant and Childhood Mortality.

the author was able to construct the corresponding number of children dead, forming proportion of dead by dividing number of children dead by corresponding CEBs, covering 4,420 households/housing units (housing situation/structure: types of wall, floor, roof, etc.), housing facilities (water, toilet, kitchen, etc.), and housing communication (durables such as radio, telephone, and TV). The analysis is, therefore, organized under three main analytical levels, namely, frequency distribution of housing conditions and examination of the impact of the housing categorical variables on under-five mortality.

Univariate and Bivariate Frequency Distribution of Housing Structure and Facilities of Addis Abeba and Other Urban Areas

Addis Abeba. Despite the fact that the city has been receiving the largest share of the national human and material resources, the city has been characterized by a number of deplorable unhealthy housing conditions.

A summary of the results is presented in Table 4. In order to upgrade and renew the existing situation of the city to acceptable standard, it calls for huge human and material resources. On top of that, the city's population has been growing rapidly due to rural and other urban migration which would compound the city's problems.

Other urban areas. The univariate and bivariate frequency distribution of the housing conditions (housing structure, facilities, and household durables) of the urban areas are presented in Appendix and summarized in Tables 18-20:

- (1) Most of the materials of floor are made of carpet/earth/dung (specially with small towns) which are full of dusts, detrimental to child health;
- (2) Material constructions of walls are mostly bamboos/woods/mud in all urban areas;
- (3) Materials for roofing are mostly corrugated iron sheets, though some thatched/leave/reed roofs in small towns;
- (4) Water supply facilities are mostly outside

Table 4. Summary of Housing Situation and Facilities of Addis Abeba

Housing facility	Percent out of total	Housing structure/situation	Percent out of total
Kitchen facility			
Traditional	67.8	Wood/mud/thatched walls	84.4
Modern	6.0	Floor of earth/mud	53-56
Rooms used as kitchen	46.9	Cooking: fire wood/dung	53.4
No kitchen	26.2	Using kerosene for lighting	10.3
		Renting households	60.6
Water supply			
Private tap	27-29	Overcrowding indicators	
No bathing	85.8	3+ persons per room	41.7
Using well/river/spring	19-22	Doubled up households	19.3
Toilet facility			
Flush toilet	12.0		
Dry pits	73-77		
No toilets	24-30		

compound, being shared among households but unprotected well/spring, specially in small towns;

(5) Toilets are mostly shared pit latrine, use of buckets and bush;

(6) Cooking facilities are kerosene, firewood straw, and charcoal;

(7) Power is available with significant coverage in big and medium cities, but about only one-third of households in small towns have electric power.

Durables. Availability of radio is significantly high in all urban classifications, but having significantly low proportions in telephone and TV in medium and very low in small towns.

In conclusion, from the univariate and bivariate frequency distribution tables of the housing structure/situation, facilities, and household communication durables of Addis Abeba and other urban areas have been characterized by the following manifestations:

(1) Prevalence of deplorable housing shortages, poor environmental sanitation, unhealthy overcrowding in terms of person/room ratios;

(2) Congestion with high rate of household

tenancy and unacceptable waste disposal practices;

(3) Unhealthy housing conditions with doubled up households, sharing the same facilities;

(4) Inadequate and qualitatively inefficient water supply system;

(5) Sub-standard unacceptable toilet facilities;

(6) Serious lack of modern kitchen facilities associated with poor cooking fuel facilities.

Impact of Housing Variables on Under-Five Mortality

Mortality is one of the components of the demographic dynamics. It plays important role in the determination of population growth and demographic transition concept, for it is the outcome of the interplay among various biological, environmental, economic, and socio-cultural factors.

This section, therefore, deals with the influence of housing conditions on the mortality levels of under-five children in urban Ethiopia. From the SPSS data file of 2005 EDHS, the proportions of children dead are computed from the difference between CEB and children living, controlled for urban areas,

housing conditions, and established proportion of dead against the categorical variables of housing situation, facilities, and household durables under sections, with details in tabular forms and corresponding graphs (see Tables 5-8 and Figures 2-5).

Impact of housing structure on under-five mortality level. The dependent variable of this study is the mortality level of “under five” and the independent variables are going to be the categorical variables of the housing structures, facilities, and household durables. This sub-section examines the correlates of urban classifications and the housing conditions (comprising mainly the material of construction of walls, floor, and roofing) with under-five childhood mortality of urban Ethiopia. The results are summarized in Tables 5-8, with their respective graphical representations (see Figures 2-5).

Impact of Housing Facilities on Under-Five Mortality

The housing facilities under this sub-section include water supply, toilets, cooking fuel, and power. The results are summarized and presented in Tables 9-13, with their respective graphical representations (see Figures 6-10).

Impact of Housing Durables on Under-Five Mortality

The variations of under-five mortality levels with respect to the household durables are examined in Tables 14-16, with their respective graphical representations (see Figures 11-13).

SUMMARY OF THE PROPORTIONALITY OF HOUSING CORRELATES OF UNDER-FIVE MORTALITY

Among the categorical variables of the housing structures, facilities, and household durables, which manifested highest proportions of the prevalence of proportion of under-five mortality levels, are summarized in the following table (see Table 17).

CONCLUSIONS

It is believed that this study provides basic inputs for urban planners and policy makers to be engaged in ameliorating the current urban housing conditions, which could contribute to the evaluation of the attainment for the 2015 MDG4 expected target and also for future improvements of urban quality of life.

The remaining task is further undertaken analysis by cross tabulating among the housing characteristics, being controlled for proportion of under-five mortality levels. For example, types of floor cross tabulating by types of wall, controlled for proportion dead, could help focus in upgrading existing housing conditions and also for future urban and housing planning, monitoring, and evaluation programmes.

APPENDIX

The issues about bivariate frequency distribution of the housing conditions of the urban areas are shown in Tables 18-20.

Table 5. Impact by Place of Residence

Urban area	Ever born	Living	Died (absolute)	Proportion died
Capital/Large city	2,552	1,928	624	.2445
Small city	2,929	2,198	731	.2496
Town	2,468	1,836	632	.2561
Total	7,949	5,962	1,987	.2500

Figure 2. Proportion Dead by Type of Urban Areas.**Table 6.** Construction Material of Floors

Types of floor	CEB	Total alive	Deaths (absolute)	Proportion dead
Earth/Sand	1,977	1,684	293	.1482
Animal dung	494	409	85	.1721
Wood planks/Reed	90	85	7	.0778
Polished wood	204	193	11	.0539
Vinyl	1,998	1,773	225	.1126
Ceramic tiles	124	118	6	.0484
Cement/Bricks	1,457	1,324	133	.0913
Carpet	252	225	27	.1071
Not usual residents	158	137	21	.1329
Total	6,754	5,948	808	.1196

Figure 3. Proportion Dead by Type of Floor.

Table 7. Construction Material of Wall

Wall material	CEB	Alive	Dead (absolute)	Proportion dead
Unconventional walls	433	293	140	.3233
Bamboo/Wood with mud	4,404	3,853	551	.1251
Stone with mud	630	552	78	.1238
Cement	177	159	18	.1017
Stone with lime/cement	435	395	40	.0920
Cement blocks	622	568	54	.0868
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,859	5,957	902	.1315

Figure 4. Proportion Dead by Type of Wall.

Table 8. Construction Material of Roofing

Roofing material	CEB	Alive	Dead (absolute)	Proportion dead
Unconventional roofing	184	149	35	.1902
Thatch/Leaf/Reed	447	337	110	.2461
Wood planks	79	69	10	.1266
Corrugated iron	5,915	5,237	678	.1146
Cement/Concrete	21	21	0	.0000
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,804	5,950	854	.1255

Figure 5. Proportion Dead by Type of Roof.**Table 9.** Water Supply

Source of drinking water	CEB	Alive	Dead (absolute)	Proportion dead
Piped in dwelling	145	130	15	.1034
Piped into compound	2,712	2,485	227	.0837
Piped outside compound	2,878	2,457	421	.1463
Unprotected well/spring	438	372	66	.1507
Protected well/spring	428	369	59	.1379
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,759	5,950	809	.1197

Figure 6. Proprtion Dead by Water Supply Facility.

Table 10. Toilet Facility

Type of toilet facility	CEB	Alive	Dead (absolute)	Proportion dead
Flush to sewer/septic tank	166	160	6	.0361
Flush to pit latrine	175	157	18	.1029
Ventilated improved pit latrine	314	275	39	.1242
Pit latrine with slab	2,840	2,549	291	.1025
Pit latrine without slab/open pit	1,971	1,719	252	.1279
Composting toilet	228	196	32	.1404
Bucket toilet	36	28	8	.2222
No facility/bush/field	871	729	142	.1630
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,759	5,950	809	.1197

Figure 7. Proprtion Dead by Toilet Facility.

Table 11. Toilet Sharing Facility

Toilet facility shared	CEB	Alive	Dead (absolute)	Proportion dead
No	2,682	2,408	274	.1022
Yes	3,052	2,679	373	.1222
Not <i>de jure</i> resident	158	137	21	.1329
Total	5,892	5,224	668	.1134

Figure 8. Proportion Dead by Toilet Facility Sharing.**Table 12.** Cooking Fuel

Type of cooking fuel	CEB	Alive	Dead (absolute)	Proportion dead
Electricity	82	77	5	.0610
Natural gas	84	81	3	.0357
Kerosene	2,083	1,891	192	.0922
Charcoal	1,191	1,065	126	.1058
Firewood, straw	3,102	2,651	451	.1454
animal dung	57	47	10	.1754
Not <i>de jure</i> member	158	137	21	.1329
Total	6,757	5,949	808	.1196

Figure 9. Proportion Dead by Type of Cooking Fuel.

Table 13. Availability of Electricity and Proportion Dead

Has electricity	CEB	Alive	Dead (absolute)	Proportion dead
No	1,058	878	180	.1701
Yes	5,543	4,935	608	.1097
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,759	5,950	809	.1197

Figure 10. Proportion Dead by Electricity.

Table 14. Under-Five Mortality Variations With Respect to Radio Availability in a Household

Has radio	CEB	Alive	Dead (absolute)	Proportion dead
No	1,382	1,144	238	.1722
Yes	5,219	4,669	550	.1054
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,759	5,950	809	.1197

Figure 11. Proportion Dead by Radio Availability.**Table 15.** Under-Five Mortality Variations With Respect to Telephone Availability in a Household

Has telephone	CEB	Alive	Dead (absolute)	Proportion dead
No	4,321	3,708	613	.1419
Yes	2,274	2,100	174	.0765
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,753	5,945	808	.1197

Figure 12. Proportion Dead by Telephone Availability.

Table 16. Under-Five Mortality Variations With Respect to TV Availability in a Household

Has TV	CEB	Alive	Dead (absolute)	Proportion dead
No	3,697	3,143	554	.1499
Yes	2,904	2,670	234	.0806
Not <i>de jure</i> resident	158	137	21	.1329
Total	6,759	5,950	809	.1197

Figure 13. Proportion Dead by Television Availability.**Table 17.** Summary Results of the Study

Housing characteristics	Highest proportion dead
1. Housing structure	
Floor: animal dung	.1721
Wall: unconventional material	.3233
Roofing: thatched leave/reed	.2461
2. Housing facilities	
Water: unprotected well/spring	.1507
Toilet: shared pit latrine, use of bucket/bush	.2222
Lightning: no electric power	.1701
Cooking: kerosene, fire wood/straw, charcoal	.1754
3. Household durables	
No household radio	.1722
No household telephone	.1419
No household TV	.1499

Table 18. Bivariate Frequency Distribution of Housing Structure by Urban Classifications

Housing structure		Classification of urban areas			
		Capital, large city	Medium city	Small town	Column total (%)
Types of wall	Modern	22.8	46.2	15.6	30.2
	Bamboo/Wood/Mud	69.8	45.3	74.6	61.5
	Others	7.4	8.5	9.8	8.3
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (948)	4,423
	Row total (%)	41.0	37.6	21.4	100.0
Types of floor	Vinyl/Cement bricks	67.9	66.2	26.3	58.4
	Carpet/Earth/Dung	27.3	30.3	71.0	37.7
	Others	4.8	3.5	2.7	3.9
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (948)	4,423
	Row total (%)	41.0	37.6	21.4	100.0
Types of roof	Corrugated iron sheets	94.3	92.5	75.7	88.8
	Thatch/Leaf/Reed	0.4	2.5	15.9	5.1
	Others	5.3	4.9	8.4	6.1
	Total	100.0 (1,812)	100.0 (1,660)	100.0 (948)	4,420
	Row total (%)	41.0	37.6	21.4	100.0

Table 19. Summary of Frequency Distribution of Housing Facilities

Housing facilities		Classification of urban areas			
		Capital, large city	Medium city	Small town	Column total (%)
Types of water supply	Pipe in dwelling/compound	71.0	49.0	25.3	51.1
	Pipe outside compound	24.0	43.6	42.8	36.9
	Unprotected well/spring	5.0	7.4	31.9	2.0
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (948)	4,423
	Row total (%)	41.0	37.6	21.4	100.0
Type of toilet facility	Pit latrine with open pit	69.3	75.0	69.3	71.5
	Flush to sewer/septic tank	19.7	8.5	6.5	12.8
	Others (bucket, bush, etc.)	11.0	3.5	24.2	15.7
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (948)	4,423
	Row total (%)	41.0	37.6	21.4	100.0
Toilet facilities shared	No	34.1	42.9	53.3	43.0
	Yes	60.7	53.3	43.5	57.5
	Not <i>de jure</i>	5.1	3.8	3.2	4.5
	Total	100.0 (1,755)	100.0 (1,531)	100.0 (758)	100.0 (4,044)
	Row total (%)	43.4	37.9	18.7	100.0

Table 19 continued

Housing facilities		Classification of urban areas			
		Capital, large city	Medium city	Small town	Column total (%)
Cooking fuel	Kerosene	69.0	29.9	4.2	40.5
	Firewood/Straw/Charcoal	21.2	60.7	92.1	51.3
	Electricity, natural gas, etc.	9.8	9.4	3.7	8.2
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (944)	4,419
	Row total (%)	41.0	37.6	21.4	100.0
Has electricity	No	2.6	1.9	31.8	8.7
	Yes	92.4	94.6	65.7	87.2
	Other	5.0	3.5	2.5	4.1
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (948)	100.0 (4,423)
	Row total (%)	41.0	37.6	21.4	100.0

Table 20. Availability of Households Durables

Household durables		Classification of urban areas			
		Capital, large city	Medium city	Small town	Column total (%)
Has radio	No	6.5	12.1	29.7	13.6
	Yes	88.5	84.4	67.7	82.5
	Not <i>de jure</i>	5.0	3.5	2.5	3.9
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (948)	4,423
	Row total (%)	41.0	37.6	21.4	100.0
Has television	No	28.0	43.3	80.2	44.9
	Yes	67.0	53.2	17.3	51.2
	Not <i>de jure</i>	5.0	3.5	2.5	3.9
	Total	100.0 (1,812)	100.0 (1,663)	100.0 (948)	4,423
	Row total (%)	41.0	37.6	21.4	100.0
Has telephone	No	38.1	58.9	83.0	55.5
	Yes	57.0	37.7	14.5	40.6
	Not <i>de jure</i>	5.0	3.5	2.5	3.9
	Total	100.0 (1,812)	100.0 (1,660)	100.0 (948)	4,420
	Row total (%)	41.0	37.6	21.4	100.0

Note

1. Neonatal (NN) Mortality: It is the probability of dying within the first month of live birth; Post-neonatal (PNN) Mortality: It is the probability of dying which consists those passing away after completing the first month of live birth, but before celebrating the first year of live birth; Infant Mortality (IMR-1q0): Infant Mortality = NN + PNN: probability of dying before celebrating the first year of live

birth; Child Mortality (4q1): probability of dying between the first and the fifth birth year; Under-Five Mortality (5q0): probability of dying between live birth and before celebrating their fifth birth day.

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Bio

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