Neighborhood, Housing, Education, and Health in Ulaanbaatar, Mongolia

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Abstract

There is a strong positive association between educational attainment and health outcomes, and neighborhood and housing play central roles in relation to both (Leventhal & Brooks-Gunn, 2002; Stafford & McCarthy, 2006). The present study examined health and education-related variables across neighborhoods, as defined by housing types and administrative districts, in Ulaanbaatar, Mongolia. Based on literature establishing associations between neighborhood deprivation and adverse health and educational outcomes, and on emerging scholarship of sprawling *ger* districts in Ulaanbaatar, the study hypothesized neighborhood residence in *ger* districts (characterized by *gers* and single family houses) would be associated with adverse health and educational outcomes due to unhealthy physical environment and poor public services. The Multiple Indicator Cluster Survey 2013, collected by UNICEF and National Statistical Office of Mongolia, was used to test the hypotheses. A series of chi-square tests of homogeneity were conducted to examine group differences in health outcomes (child mortality and antenatal care) in a sample of 4,708 women of ages 15-49 and educational outcomes (school attendance) in a sample of 3,604 young people between the ages of 6-18, across three types of housing (*gers*, houses, apartments) and nine administrative districts in Ulaanbaatar. Results indicate residence in *ger* districts is associated with higher rates of child mortality and lower rates of school attendance compared to residence in apartment districts. It was concluded residence in *ger* districts may be associated with heightened risk of poor health and educational outcomes. Policy implications include improvements in physical environment and public services in *ger* districts.

Résumé

Le niveau de scolarité atteint et les conditions de santé représentent des facteurs fortement entre reliées. De plus, les caractéristiques relatifs au quartier d'habitation et au logement jouent un rôle central en ce qui concerne cette relation (L'éventa et Brooks-Gunn, 2002; Stafford & McCarthy, 2006). Dans la présente étude, les conditions de santé et le niveau d'éducation atteint seront examiné auprès d'individus à Oulan-Bator en Mongolie, habitant dans des logement et des districts administratifs distincts. Une revue de la littérature portant sur le sujet suggère que les quartiers à Oulan-Bator connus sous le terme district *ger*, soit caractérisés par des conditions défavorable et des petites maisons en yourtes, contribuent au développement de problèmes de santé et de difficultés scolaires. Par conséquant, il est prévu que les problèmes de santé et la sous-performance scolaire des résidents des districts *gers* soit associés à l'environnement physique malsain et la piètre qualité des services publics. L'enquête par grappes à indicateurs multiples des données recueillies par l'UNICEF et l'Office national de statistique en Mongolie a été utilisée pour étudier cette hypothèse, suivit d'une série d'épreuves de l'homogénéité du chi-carré pour examiner les différences entre groupes en terme de conditions de santé (mortalité infantile et soins prénatals) et de résultats scolaires (fréquentation ou non d'institution scolaire) dans un échantillon de 4 708 femmes âgées de 15 à 49. Les groupes ont été divisés par rapport aux trois types de logements (*gers*, maisons, et appartements) et neuf districts administratifs à Oulan-Bator. Les résultats indiquent que la résidence en districts agricoles est associée à des taux plus élevés de mortalité infantile et à des taux de fréquentation scolaire plus faibles que la résidence en quartiers d'appartements. De plus, la résidence en districts de *ger* est associée à un

risque accru de problème de santé et de sous-performance scolaire. Les répercussions sur les politiques comprennent l'amélioration de l'environnement physique et des services publics dans les districts agricoles.

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Introduction

Health is a fundamental human right, and the economic and social rights - including food, clothing, housing, medical care, and necessary social services - are recognized as prerequisites for health and well-being (Universal Declaration of Human Rights, 1948). In fact, primary factors that shape population health are not medical treatments or lifestyle choices, but living conditions that people experience (Mikkonen & Raphael, 2010). In other words, health inequities are, in most part, unfair and avoidable differences in health outcomes within and between countries (World Health Organization (WHO), 2010), and they could be seen as the final product of "structural violence" in society - the social and economic inequities that determine who will be at risk and who will not be (Farmer, 1999). In line with this, most causes of disease and death in 21st century are from preventable, social factors (WHO, 2010).

The living conditions that determine health are also known as social determinants of health, and include factors such as housing situations, work settings, health and social service agencies, and educational institutions (Mikkonen & Raphael, 2010). According to the World Health Organization's (WHO) definition:

> The social determinants of health are the circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics. (WHO, n.d.)

Among these, education is one of the strongest predictors of health (Freudenberg & Ruglis, 2007). Good education paves the way for good health in numerous and well-documented ways,

with its relationship to occupation and income being two of the most central pathways in this relationship.

It is equally well-evidenced that neighborhoods and housing exert influence on both health (Truong & Ma, 2006; Sampson, Morenoff, & Gannon-Rowley, 2002), and education related outcomes (Leventhal, & Brooks-Gunn, 2000; Johnson, 2012). Neighborhood economic deprivation is associated with morbidity rates, mortality rates, and mental health (Truong & Ma, 2006; Martikainen, Kauppinen, & Valkonen, 2003), as well as developmental and educational outcomes such as school readiness and achievement, emotional and behavioral problems, and sexuality and childbearing (Leventhal & Brooks-Gunn, 2002).

The aim of the current study is to explore the health and educational outcomes of residents in Ulaanbaatar across administrative districts and across housing/dwelling types, which is a significant neighborhood characteristic in Ulaanbaatar. This study is a significant contribution to the literature for a number of reasons. First, although there have been studies by academic scholars and international organizations in Mongolia which examine urban-rural differences in educational outcomes such as dropout and school attendance rates, no study to date has looked at differences in educational outcomes *within* the capital of Mongolia, which is home to almost half of the nation's population. Second, an analysis of disparities in health and educational outcomes between residents of different neighborhoods (using different conceptualizations of neighborhoods) within the city would lay the groundwork for research of neighborhood effects on health and educational outcomes of young people in Ulaanbaatar.

This literature review will begin by providing an overview of the relationship between

education and health, and the role of neighborhoods and housing as central to both. Then, an overview of the socio-economic conditions in Mongolia will be used to depict an essential historical background for understanding the current situation in education and health sectors of the country. Next, research on the relationship between education and health in Mongolia will demonstrate the ways in which education leads to good health**.** Next, health research on Ulaanbaatar neighborhoods will be provided. It should be noted that compared to the scholarly research on health, the research on education is relatively sparse in Mongolia. Hence, research reports by international and governmental organizations are included in the review of the education research. Finally, the review concludes with an introduction to the current research study, drawing conclusions that dwelling type in Ulaanbaatar is a significant neighborhood characteristic itself, and as such there is a need for an ecologic study that examines both educational and health outcomes across dwelling types as well as administrative districts in Ulaanbaatar.

Literature Review

Relationship of Education to Health

There is a strong association between education and health, such that health status improves in tandem with education level (Grossman, 1976; Cutler & Lleras-Muney, 2006). Furthermore, this finding holds true whether health status is measured by mortality rates, morbidity rates, disability rates, health risk behaviors, or self-evaluation of physical and mental functioning, whether education is measured by level completed or years of schooling, and whether units of analysis are individuals or populations (Grossman, 1976; Cutler & Lleras-

Muney, 2006; Samir & Lentzner, 2010). Less formal education is associated with earlier death (Montez, Hummer, Hayward, Woo, & Rogers, 2011) and higher levels of risky health behaviors such as smoking, poor diet and exercise, heavy drinking, risky driving, dwelling in unsafe conditions, and being less likely to use preventive care (Cutler & Lleras-Muney, 2010).

The literature indicates various possible mechanisms by which education leads to good health, including income, occupation, information and cognitive skills, increased levels of healthy behaviors, and social networks (e.g., Cutler & Lleras-Muney, 2006; Freudenberg & Ruglis, 2007) all of which are inter-related. Although education and income are highly correlated, evidence suggests that they are separately protective (Deaton, 2002) as well as complementary in the production of health (Cutler, & Lleras-Muney, 2006). Educational attainment is associated with earnings and other favorable conditions of jobs such as autonomy, flexibility, and engaging nature (Johnson, Staff, Schulenberg, & Patrick, 2016). Financial resources resulting from employment are in turn linked to healthier behaviors. For instance, resources such as income and health insurance accounted for around 20% in the relationship between educational status and health behaviors (Cutler & Lleras-Muney, 2010). Concurrently, it is argued that economic difficulties damage health by repeatedly activating the body's stress response over long periods of time - this may contribute to the difference in health outcomes between low and middle-income individuals (Mirowsky & Ross, 2003).

Education imparts people with knowledge as well as cognitive skills, which facilitate a healthy way of life (Johnson, Staff, Schulenberg, & Patrick, 2016). Finally, education is also associated with higher levels of social support and odds of getting and staying married, which in

turn enhance one's physical and mental health and protect from stress (Johnson, Staff, Schulenberg, & Patrick, 2016).

In summary, education leads to good health by way of occupation and financial resources, acquisition of knowledge and skills, engagement in healthy behaviors, and having adequate social support, as such the importance of education on health cannot be underestimated. That being said, research also suggests that getting a good education is dependent on good health to start with (Cutler & Lleras-Muney, 2006). Low birth weight is a health marker which is predictive of number of years of schooling and poor health in adulthood (Black, Devereux and Salvanes, 2005; Roseboom et al., 2001). Similarly, malnourishment and sickness in older children are predictive of low school attendance, and lower likelihood of graduation (Case, Fertig and Paxson, 2005). All in all, research seems to suggest that the relationship between education and health is mutually dependent and reinforcing which highlights the need to study them together.

Neighborhoods and Housing as Central to Both Education and Health

Neighborhoods are nested communities within larger geographic locales and they allow for an examination of ecological forces shaping the lives of individuals within them (Sampson, Morenoff, & Gannon-Rowley, 2002). Housing can be conceptualized as an independent social characteristic like income within the social determinants of health framework and is linked to neighborhoods by being a place of residence for individuals within neighborhoods and by being the physical environment for individuals (Stafford & McCarthy, 2005).

Before reviewing the literature on the effects of neighborhoods on education and health,

it should be noted that defining neighborhood dimensions is not a simple task and poses a significant challenge to the research community (Leventhal & Brooks-Gunn, 2000; Sampson, Morenoff, & Gannon-Rowley, 2002; Stafford & McCarthy, 2005). Administrative boundaries such as census wards in the UK and census tracts in the US are often used as a neighborhood unit of analysis (Stafford & McCarthy, 2005; Leventhal & Brooks-Gunn, 2000). Once neighborhoods are identified, an important distinction in the literature is made between structural and social organizational characteristics of neighborhoods (Leventhal & Brooks-Gunn, 2000; Stafford & McCarthy, 2005). Structural characteristics include economic and demographic information such as extent of neighborhood poverty, female family-headship, public assistance receipt, male joblessness, racial/ethnic diversity, residential instability, etc. On the other hand, social organizational aspects include measures of neighborhood mechanisms such as social ties and interaction (e.g., patterns of neighboring and frequency of interaction), norm and collective efficacy (e.g., informal social control and social cohesion), services and institutional resources (e.g., libraries, schools, child care, medical facilities, family support centers), and routine activities or physical environment (e.g., type of land use in the neighborhood, pollution, and green spaces) (Sampson et al., 2002; Stafford & McCarthy, 2005). Although researchers tend to examine structural and social-organizational characteristics separately, it is likely that these characteristics co-vary such that more affluent neighborhoods are also likely to be more socially cohesive, enjoy higher quality services and resources, and live in healthier physical surroundings (Stafford & McCarthy, 2005).

Another challenge posed to researchers in this domain is that variations in education and

health alone are not sufficient to conclude that neighborhoods have an influence on residents' education or health outcomes, because differences captured by researchers may be due to the fact that individuals with similar profiles tend to live in the same area, generating a conflation that is known as a compositional effect (Stafford & McCarthy, 2005; Ross & Mirowsky, 2008; Leventhal & Brooks-Gunn, 2000; Diez Roux, 2001). Multi-level studies which combine neighborhood level data with individual data have allowed researchers to identify contextual effects whereby neighborhoods impact health and education above and beyond individual factors. Therefore, only research that takes into account individual and family-level variables as well as neighborhood-level data in the analysis of the effects of neighborhoods on education and health outcomes is reported below. Only when an analysis takes into account individual traits, family characteristics, *and* structural components of neighborhoods, can it be concluded that neighborhoods have an influence on health above and beyond individual and family level variations (Diez Roux, 2001).

Neighborhoods matter for children and youth because research consistently finds a positive association between neighborhood characteristics and school readiness and achievement, behavioral and emotional problems, and sexuality and childbearing (after accounting for individual and family characteristics) (Leventhal & Brooks-Gunn, 2000). Young people living in affluent neighborhoods score higher on verbal ability, reading recognition, and math achievement, and are more likely to complete high school and attend college (Froiland, Powell, Diamond, & Son, 2013; Johnson, 2013). Neighborhood affluence has also an impact on children's externalizing problem behaviors, levels of depressive symptomatology, and substance

use (Buu et al., 2015; Winslow & Shaw, 2007). Finally, socioeconomic conditions of neighborhoods are associated with an increased risk of adolescent and nonmarital childbearing, and are negatively associated with premarital sex, number of sexual partners, and effective contraceptive use (Carlson, McNulty, Bellair, & Watts, 2014; Penman-Aguilar, Carter, Snead, & Kourtis, 2013).

In terms of health outcomes, studies have shown associations between neighborhood deprivation and infant and child health (Robert, 1997; Krieger et al., 2013), health-related behaviours (Yen & Kaplan, 1998; Jim et al., 2003), perceived general and mental health (Ross & Miroswky, 2001), cardiovascular disease (Barber et al., 2016), violence and murder (Leylas & Dundas, 2010; Shaw, Tunstall, & Dorling, 2005), and all-cause mortality (Martikainen et al., 2003; Halonen et al., 2013). In most studies, increases in deprivation are associated with incremental increases in the risk of morbidity and mortality. Similar results are found between health outcomes and neighborhood indicators of social capital (e.g., neighborhood trust level), neighborhood amenities (e.g., perceptions of quantity and quality of leisure and social facilities for children and teenagers, schools and colleges, and health services), and neighborhood indicators of physical space (e.g., built environment, particulate concentration and sulphur dioxide levels, and cold climate) (Stafford & McCarthy, 2005). Keeping these neighborhood influences on health and educational outcomes in mind, I will give background information on Mongolia, and place the neighborhood structural and social organizational characteristics in a context of the city of Ulaanbaatar.

Mongolia: The Socio-Economic Context

Mongolia is one of the least densely populated countries in the world with just over 3.1 million people (National Statistical Office of Mongolia (NSOM), 2016). The Mongols are quite homogeneous ethnically: four-fifths of the population in Mongolia are Khalkhs, and the vast majority of the population speaks Mongolian (NSOM, 2016). Mongolia has a young and growing population. In 2014, around 27% of the population was under the age of 15, with 29% reported between the ages of 15 and 29, and 23% between the ages of 30 to 44.

Mongolia is administratively divided into 21 provinces (*aimags*). Ulaanbaatar is situated within Tov Province (*aimag)* but is governed as an independent first-level region separate from Tov Province, and is divided into nine districts (called *duuregs*): Baganuur, Bagakhangai, Bayangol, Bayanzurkh, Chingeltei, Khan-Uul, Nalaikh, Songinokhairkhan, and Sukhbaatar. Districts (called *duuregs*) are further divided into 152 sub-districts (called *khoroos*), and *khoroos* are further divided into *khesegs* (NSOM, 2016). Each district (*duureg*) serves as a constituency that elects one or more representatives into the national parliament. All districts (*duuregs*) except for Baganuur, Bagakhangai, and Nalaikh have population sizes of 137,000 - 320,000 (Statistics Department of Ulaanbaatar, 2017). It should be noted that although administratively Baganuur, Bagakhangai, and Nalaikh are part of Ulaanbaatar, they were separate cities until 1992 (Nalaikh District, 2015; Bagakhangai District, 2017). Bagakhangai was established as a Soviet military base as was Baganuur which is also a site of the largest open pit coal mine in Mongolia. These three districts (*duuregs*) have population sizes of 4,000, 28,000, and 35,000 respectively, and are much smaller than the remaining districts.

Ulaanbaatar is the cultural, economic, political, and religious centre of Mongolia. It is also the most densely populated administrative region in Mongolia, with 42% of the total population occupying 4.7% of the total land area of the country. This was not always the case, and many Mongolian studies scholars refer to the exponential growth in Ulaanbaatar's population as the "Big Migration" of the past several decades (Lindskog, 2014; Mayer, 2016).

Internal migration within Mongolia, and rural-to-urban migration more specifically, has risen exponentially since the 1990s (Mayer, 2016). For example, the annual inflow of migrants to Ulaanbaatar rose by 40% in 2010 following a local meteorological phenomenon known as *dzud* - which resulted in death of large numbers of livestock for the nomadic pastoralists of Mongolia. *Dzud* occurs when a dry summer weakens the livestock and is followed by a harsh winter, which in turn leads to the loss of the weakened livestock, and thus of livelihoods. Although the Mongolian government frames the migration issue as the result of climate change leading to harsh *dzud* as a way to secure international aid, an alternative narrative would be that of unsustainable development policies in Mongolia catalyzed by the transition from socialist to capitalist regime of governance, also known as the Age of the Market in Mongolia (Dierkes, 2012).

Prior to 1921 Mongolia was a Buddhist theocracy where the main economic activity was herding and groups of herding households were part of and supported by Buddhist monasteries and landed nobility (Humphrey & Sneath, 1999). In 1921, influence of the Bolshevik Revolution in Russia led to the foundation of the pro-Soviet "People's Government" in Mongolia (Dierkes, 2012). With the establishment of the socialist regime in 1921, the pastoral institutions were

dismantled and families were re-organized into state-controlled cooperative enterprises (Janes, 2004) - institutions that supported herding households. They functioned similarly to the institutions prior to 1921, such that access to essential resources was regulated and herding households were protected from risks of harsh and unpredictable weather (Janes, 2004). The major achievement during the socialist regime was an opening of access to education, health, and other social services to the whole population (Dierkes, 2012).

Reforms of the Soviet Union by Mikhail Gorbachev were pivotal for protest movements in Mongolia in the winter of 1989-90 (Dierkes, 2012). As Mongolia transitioned to free economy democracy in 1990 after 70 years of Soviet-style socialism, it was admitted into the Asian Development Bank (ADB), the International Monetary Fund (IMF), and the World Bank (WB), was advised by these donor-organizations, and received loans and grants upon adoption of structural reform packages (Dierkes, 2012). These reforms, also known as *shock therapy*, entailed privatisation of public assets and state-run enterprises, price liberalization, introduction of free markets, a marked reduction in the size of government, and dismantling of the state farms and pastoral herder collectives (Dierkes, 2012; Janes, 2004).

These economic reforms led to a deterioration of the average standard of living, and an increase in poverty, economic insecurity, and inequality in income distribution and assets (Griffins, 2001). The early 1990s in Mongolia were chaotic - unemployment rates skyrocketed, leading to poverty, homelessness, heightened crime rates and alcohol abuse (Janes, 2004). Between 1989 and 1999 government health care expenditures declined from 6% of the total GDP to 3.3%, education expenditures declined from 11.5% of GDP to 5.5%, and school enrollment of

children between 8-15 years old declined from 100% to 87% (UNDP, 2000).

It could be argues that pastoralists were particularly affected by these reforms. Existence of pastoral collectives prior to the reforms meant that herders had a support network and did not solely bear the burden of natural calamities. Dissolution of these collectives increased the burden of natural calamities such as *dzud* for herders now having to absorb the consequences individually. According to Lindskog (2014), the limited options for herders who have lost their livestock currently include taking up large loans, becoming miners in the informal sector, or leaving herding altogether for migration to the city. Furthermore, the Mongolian government and its international donors discontinued investment in rural development after the 1990s. Additionally, the agricultural sector was deregulated and disinvested in (Mayer, 2016) leading to social and economic marginalization of the rural population – many of whom ended up on the periphery of Ulaanbaatar, in locations known as *ger* districts[1]. In 2010, around 60% of Ulaanbaatar's population lived in *ger* districts, which are located on the periphery of the capital (NSOM, 2013). *Ger* districts combine both houses and *gers* - not all households in *ger* districts

[1] District in this case is not synonymous to an administrative district, rather refers to areas in Ulaanbaatar characterized by *ge*r dwellings and lack of basic infrastructure such as heating and sewage (Byambadorj, Amati, & Ruming, 2011). *Gers*, commonly referred to as *yurts* in English, are circular tent-like dwellings used by Mongolian herders who move with the seasons seeking new grazing locations for their herds. *Gers* consist of wooden frames and wool felt outer layer. They are lightweight and are easily assembled and dismantled.

live in *gers*. In fact, in 2010 half of the households in *ger* districts in Ulaanbaatar lived in *gers* and the other half lived in single family houses (NSOM, 2013). Importantly, regardless of the type dwelling, g*er* district residents lack access to infrastructure and to services compared to apartment district residents. Specifically, the majority of *ger* districts have access to electricity but not to a supply of hot water (Byambadorj et al., 2011). *Ger* district residents purchase their drinking water from distribution wells where the water is transported to by trucks. Ninety-seven per cent of households in *ger* districts have outside latrines and no bathroom (UNDP, 2004). There is no heating system in ger districts - the majority of households use wood and coal for cooking and heating, an activity that substantially contributes to urban ambient air pollution (UNICEF, 2016).

The majority of households migrating to Ulaanbaatar tend to settle on the outskirts of Ulaanbaatar in *ger* districts (Caldieron, 2013; Mayer, 2016; Lindskog, 2014). Caldieron (2013) found that 50% out of 114 households sampled from four *ger* districts in Ulaanbaatar were composed of people who lived as pastoralists prior to moving to the *ger* district. While the recent boom in the mining sector has been a source of major economic growth in Mongolia, the government has paid minimum attention to health, education, and social support systems, and has been criticized for poor distribution of wealth and growing inequities in these domains (Lindskog, 2014). Poor distribution of income in turn is reflected in social stratification based on place of residence as evidenced by the report by the National Statistical Office of Mongolia (2004) which shows that apartment district residence was associated with higher household income and standard of living, whereas *ger* districts were home to households on lower end of

income spectrum and standard of living. Thus, it can be said that *ger* districts are characterized by low socioeconomic status, lack of necessary amenities, and poor quality physical environment compared to apartment districts. Furthermore, residence in *gers* and single family houses can serve as proxy to residence in *ger* districts.

The Relationship between Education and Health in Mongolia

The relationship between educational attainment and health outcomes in Mongolia is an area of study that is becoming increasingly popular among international scholars (e.g., Demaio et al., 2013a, b, c), as it aptly demonstrates the global recognition of education as a social determinant of health itself. The recent large scale epidemiological studies (N=3,450; 2,280; 44,510) in Mongolia show associations between educational attainment and health-related outcomes such as heart disease, problematic drinking, health knowledge, self-reported chronic illness and physical limitation, and use of health care services (Demaio et al., 2013 a,b,c; Dorjdagva, Batbaatar, Dorjsuren, & Kauhanen, 2015 a,b; Enkh-Oyun et al., 2013).

These studies have all used level of school completed as a measure of education. Using the Non-Communicable Diseases (NCD) Knowledge, Attitude, and Practices survey, Demaio et al. (2013a,b,c) found that low educational attainment was positively correlated with problematic drinking, and lower knowledge levels about diabetes and hypertension in a sample of 3,450 individuals across Mongolia. Enkh-Oyun et al. (2013) found that the prevalence of ischemic heart disease, one of the most prominent causes of cardiovascular diseases in Mongolia, was correlated with level of schooling such that higher levels of schooling were associated with lower prevalence of the disease. Using a nationwide cross-sectional data from 44,510 individuals from

the Household Socio-Economic Survey 2007/2008 carried out by the National Statistical Office, Dorjdagva, Batbaatar, Dorjsuren, & Kauhanen (2015) found that higher educational attainment was associated with lower level of self-reported chronic illness or physical limitation/disability in both rural and urban areas. Using the same survey, Dorjdagva et al. (2015) have also found income-related inequities were associated with level of hospital outpatient and inpatient service use, to which education was a contributing factor.

Educational gradient. Research shows that higher levels of educational attainment are associated with higher wages across Mongolia (Pastore, 2010, 2016). Specifically, Pastore (2010) shows that wages of young specialized secondary and tertiary degree holders in Mongolia were 64% and 85% higher than those with basic education or lower. Furthermore, Pastore (2010) found that returns from education were much higher in Ulaanbaatar and *aimag* centers, than *soum* centers and rural areas. This study was an analysis of wage distribution of 6,100 youth of ages between 15 and 29 carried out using the School to Work Transition Survey conducted in Mongolia in 2006. While vocational education presented a very low wage premium, migrant status did not have an impact on earnings. In addition, educational attainment of young people was related to those of their parents.

Although the monetary returns to education levels above the basic education were high, it was also found that children from less wealthy families were more likely to drop out of school (Pastore, 2016), and less likely to be socially mobile. Pastore (2016) examined the role of education as a mechanism through which household poverty leads to youth poverty. The analysis was based on the same survey as Pastore (2010) with youth of ages between 15 and 29 as the

participants. It was found that a young person born to a family living on US$1 is four times more likely to drop out of school than youth born to a family living on more $3 a day. Importantly, *ger* districts are home to the most disadvantaged population group in Ulaanbaatar (NSOM, 2004). It was revealed that the parents' educational attainment explained 40% of variability in student drop-out of compulsory education. It was speculated that the remaining variability was due to unfair treatment students from low SES households experience at school both from teachers and students (del Rosario, 2005). This is especially relevant to the context of Ulaanbaatar, where there are significant wealth disparities in the population. It was also found that dropping out leads to higher probability of being unemployed as well as working for a salary below the poverty line.

In summary, (1) rates of return to education are higher in Ulaanbaatar than in rural areas, (2) there is a significant association between parents' and children's educational attainment, and (3) low income level, and low parental educational level are predictive of dropping out of compulsory schooling, which subsequently leads to low wage employment. Given the link between educational level and health outcomes, neighborhood effects on educational outcomes need to be examined in the context of Mongolia, and specifically in Ulaanbaatar given the size of, diversity of and disparities within its' population. I suggest the comparisons of "urban" and "rural" areas as was carried out in Pastore (2010; 2016) are misleading as employment opportunities and way of life are very different in *aimag* centers, *soum* centers, rural areas, and Ulaanbaatar. It is important not to consider Ulaanbaatar as a homogeneous urban group, as ethnic and cultural groups, and relative social, educational and economic opportunities vary by

neighborhood/dwelling type in and around the capital city as will be shown in the review of literature on *ger* districts in Ulaanbaatar, and because increasingly, rural populations are residing in these urban spaces. Therefore, as education is organized at the neighborhood level, it is important to explore the role of neighborhoods as the determinant of educational drop-out in Ulaanbaatar, which is now home to 40% of the country's total population, in order to improve policies and programs, and educational, economic, social, and health outcomes for what will be nearly half of the nation's population.

Rural-urban educational inequities. Reports by international organizations in Mongolia make up a significant part of information on education in Mongolia and have shown the association between wealth and educational enrollment. The Multiple Indicator Cluster Survey, also known as MICS, is a survey tool created by UNICEF and used internationally to obtain comparable data across time and countries (NSOM, 2015). The latest round of MICS was conducted in 2014 in Mongolia involving over 14,000 households (NSOM, 2015). According to the MICS final report by NSOM (2015), children from more wealthy families in Mongolia were more likely to attend higher education, and enrollment rates were higher for more wealthy families at each educational level. Enrollment rates at primary level were around 96% to 99%, at lower secondary level the rates decreased and were 85% for the poorest families and 98% richest families, at upper secondary level the rates decreased further and were 69% for the poorest and 97% for the richest (NSOM, 2015). Put simply, 97% of children from the richest families have the opportunity to graduate and perhaps continue their education in comparison to only 69% of children from the poorest households. In summary, (1) the higher the school level the lower the

enrollment rates: as children grow older, the opportunity cost of education increases (Boyle et al., 2002); and (2) at primary, lower secondary, and upper secondary levels enrollment rates were higher for children whose parents were more wealthy and for those whose parents had higher educational attainment. On both wealth and parental educational attainment, children residing in apartments are more likely to be better off than their *ger* district dwelling counterparts.

Despite the low enrollment rates for less wealthy families in Mongolia, current academic literature highlights inequities in education access and quality between rural and urban residents only, and studies on disparities *within* Ulaanbaatar are scarce. In their study about quality and equity in the Mongolian education sector, Steiner-Khamsi & Amgaabazar (2009) noted that the four groups most disadvantaged in terms of access to education were boys, out-of-school children, vulnerable and minority children, and children of herders. Furthermore, the authors described school drop-out as mainly a rural phenomenon. Undoubtedly, nomadic pastoralists were placed at a disadvantage since the 1990s ill-conceived donor-supported structural adjustment reforms in Mongolia which led to serious neglect of the rural population - lack of educational services and opportunities (Stolpe, 2016), as well as health and other social services (Lindskog, 2014). An evidence of structural discrimination experienced by the nomadic pastoralists' in the education sector is the policy that required herders to pay for their children's schooling in the form of meat (Stolpe, 2016). The neglect of rural development and lack of social services in rural areas are now putting a strain on the health and educational systems in Ulaanbaatar as its' population grows from in-migration from rural areas (Lhamsuren et al., 2012). Therefore, the situation of educational of outcomes of youth in Ulaanbaatar across

different neighborhoods warrants closer attention.

Rural to urban comparison is also evident in the reports by international organizations. For instance, the MICS report by UNICEF compared educational outcomes across regions (Western, Khangai, Central, Eastern, Ulaanbaatar) and locations (urban vs rural) in Mongolia (NSOM, 2015), thereby treating Ulaanbaatar as one entity whereas within the city the residents are endowed with vastly different living conditions.

Although Ulaanbaatar is treated as an urban area and has relatively high enrollment rates in secondary schooling, it does not mean every child enjoys the same quality education. Engel, Prizzon, & Amgaabazar (2014) emphasized that increase in enrolment rates was a major accomplishment since the 1990s, but pointed to the issue of quality of education. Public school students receive a lower standard of education compared to private school peers due to overcrowded classes, often with 40-50 students in a classroom, and lack of improvement in the quality of instruction over the past few decades (Open Society Forum Mongolia, 2010). Children and youth in informal *ger* districts in Ulaanbaatar are likely to attend one of public schools in their neighborhood because public schools are tuition-free, whereas private school fees range from $500 to $22000 and these schools are not affordable for youth from low SES backgrounds. The result of this is underachievement of public school students - all of the top ten schools based on the achievement on the 2013 final government exam for high school graduates in Ulaanbaatar were privately-owned schools except for one (Batbayar, 2014). To sum up, existing research on the relationship between young people's educational outcomes and wealth as well as parental educational attainment, and private vs public school quality seem to suggest that youth residing

in *ger* districts are at a disadvantageous situation in terms of schooling outcomes.

Ger Districts in Ulaanbaatar

The distress of Ulaanbaatar *ger* district residents is reflected in the sparse but available health research done in Ulaanbaatar focusing on the differences between *ger* and *non-ger* districts on measures such as environmental risk, including water supply, sanitation, and air pollution, health care access, and social exclusion. Jadambaa and colleagues (2015) reviewed a total of 59 studies published between 1999 and 2013 on associations between environmental risk factors and adverse health outcomes in Mongolia with a focus on children. Thirty-six studies were conducted in major cities of Ulaanbaatar, Darkhan, and Erdenet with 7 studies in *ger* districts, and 11 studies in rural areas. Environmental risk in Ulaanbaatar presents itself in the form of poor access to water and sanitation, and contamination of air, soil, and water (Jadambaa, Spickett, Badrakh, & Norman, 2015), and the topic has received the most attention in research of Ulaanbaatar neighborhoods.

Environmental risk factors included air pollution, exposure to metals, lack of water and sanitation facilities, occupational exposures, and environmental tobacco smoke (Jadambaa et al., 2015).. The ambient concentrations of air pollutants in Ulaanbaatar were 32 times higher than World Health Organization guideline. Importantly, indoor air pollution was higher in *gers* and houses (which make up *ger* districts) than in apartments and children living in *gers* and houses reported higher levels of respiratory symptoms than children living in apartments. Indoor volume of classrooms in overcrowded schools in *ger* districts did not meet hygiene requirements. Furthermore, many metal pollutants were found in soil, water, and air in high levels than

recommended. Astonishingly, lead levels detected in drinking water containers in *ger* districts were as much as 500 to 800 times higher than the permissible maximum level by the WHO, and *ger* district residents were likely to be exposed to other hazardous chemicals via their drinking water. Around 18% of water samples from water kiosks in *ger* districts were contaminated with E coli. In summary, children in *ger* districts, residing in both *gers* and houses, are more exposed to environmental risks than their apartment district dwelling counterparts. The quality of water the children in *ger* districts drink, the cleanliness of the air they breathe, and the soil they walk and play on are all likely to be substandard at best and severely dangerous at worst.

Another significant issue for *ger* district residents, which also often is a significant factor for internal migrants in their decision to move to Ulaanbaatar, is access to health care services (Lhamsuren et al., 2012). Lindskog's (2014) critical examination of the public health system of Mongolia suggests that the health care system in Mongolia is failing to cater to needs of urban in-migrants and nomadic pastoralists in remote areas. Drawing from comparative ethnographic research conducted in 1996, 2003, 2011 and 2013 involving women (both migrant to Ulaanbaatar and herder in rural area), midwives, doctors, and health officials, Lindskog (2014) analyzed equity and fairness issues in access to health care services in Mongolia. His analysis revealed that "the city's countryside people" and herders in countryside lacked access to affordable primary health care. Before the neoliberal macro-economic reforms which started in the 1990s, rural populations received the necessary social services and risks of natural calamities such as *dzud* were born by collectives (Lhamsuren et al., 2012). As these arrangements no longer exist, herders in countryside move to Ulaanbaatar and build their *gers* on the fringes of the city in

the *ger districts* which are infamous for their overcrowded primary care facilities which threaten health and well-being. In addition, lack of documentation in the migrant population further inhibits access to health care services in *ger* district areas. Low level of access subsequently leads to delay in help-seeking whereby chronic conditions go untreated. Due to this chain of events, nomadic pastoralists live on the margins of Mongolian society in terms of access to health care services. In the countryside, these services are difficult to reach and not comprehensive, yet in Ulaanbaatar they are overcrowded and use is hindered due to registration and documentation issues that are commonly experienced by new internal migrants.

Finally, *ger* district residents, especially those who have recently arrived, are likely to experience social exclusion by way of being isolated from basic social services due to poor infrastructure, and a lack of support networks resulting from recent migration (Terbish & Rawsthorne, 2015). Importantly, these barriers to social participation were faced by most *ger* district residents regardless of variation in income level highlighting the importance of the physical infrastructure of neighborhoods in social relations, and engagement in social life which are linked to presence of social support networks (Stafford & McCarthy, 2006).

In closing, it is evident that on structural level residence in *ger* districts entails exposure to environmental risks (unsafe drinking water and polluted air), hindered access to primary health care and social services due to poor infrastructure or overcrowding, and social isolation all leading to poor health outcomes. Individual-level variables such as migrant status and income level are also likely to contribute to health outcomes. Taken together, analysis of health outcomes by dwelling type is likely to be a worthwhile line of inquiry that will contribute to

understanding of neighborhood effects in Ulaanbaatar. Put differently, dwelling type in the context of Ulaanbaatar is an important proxy for neighborhood.

School dropout in Ulaanbaatar *ger* districts. In 2005 two reports on the school dropout phenomenon in Mongolia were published by international organizations: one by the Open Society Institute Education Support Program (OSIESP) under Open Society Foundation, and the other by Childhood Poverty Research and Policy Centre, a collaborative research initiative involving academic institutions and Save the Children in China, India, Kyrgyzstan, Mongolia, and the UK. Both were relatively large scale studies with sample sizes of 532 and 4879 individuals respectively. Both studies used a combination of quantitative and qualitative methods: questionnaires, interviews, and focus group discussions involving various stakeholders. While del Rosario (2005) sampled only students who have dropped out and students who were at risk of dropping out based on predetermined criteria, their parents, school teachers, policymakers, social workers, and policemen, Batbaatar, Bold, Marshall, Oyuntsetseg, Tamir, & Tumennast (2005) focused their analyses on the relationship between migration and education and interviewed in-school and out-of-school 12-14-year-olds (both migrants and non-migrants), young people above the age of 14, parents, teachers, social workers, *soum*, *aimag* and city governors, and education and other key policy makers at different levels.

First, the researchers revealed that there is lack of common definitions and procedures to record the number of students who have dropped out in Mongolia (del Rosario, 2005). Comparison of dropout rates by different agencies showed that the difference between the highest (United Nations Human Rights Commission) and the lowest (National Statistical Office

of Mongolia) figures was over 56,000. As such, school dropout statistics provided by the government are not reliable.

Second, education was found to be one of the key reasons for migration after employment[2]. Although education was the second most popular driving factor behind migration to Ulaanbaatar, 55% of migrant children said they lived further away from school than they had before migrating. Not surprisingly, Batbaatar et al. (2005) found that migrant families tended to live on outskirts of the city, putting them further away from schools which could either mean not being able to go to school or having to overcome issues with transportation and security. Ulaanbaatar was the site of the highest rates of out-of-school migrant children, and migrant children were three times more likely to be out of school, and four times more likely to drop out of school than non-migrant residents.

Third, focus group discussions and interviews with parents and children revealed that dropping out was associated with registration issues, discrimination against children coming to school from *ger* districts, the essentially institutionalized and accepted practice of collecting money from students for various unregulated reasons, the financial inability to cover the costs associated with going to school, and inability to catch up with schoolwork (del Rosario, 2005; Batbaatar et al., 2005). Migrant children who lagged behind or those who were perceived as poor were often discriminated against by teachers. Furthermore, teachers noted that their salaries were decided in accordance with the performance of their students, which discouraged teachers from wanting low performing students in their classes. Although migrant children in Ulaanbaatar

[2] Other reasons for migration included health issues and proximity to hospitals (Batbaatar et al., 2005).

could benefit from private tutoring and other commonplace services offered by teachers, these services were more accessible to more wealthy residents. The proportion of migrant children involved in income-generating activities was higher than that of non-migrant children, suggesting they came from less wealthy families in the city.

Finally, it is worth noting that the structural inequities in education tend to get explained by individual or family factors as was done in one of the reports by UN which included "lack of interest in learning" as one of the reasons for dropout (Stolpe, 2016). This is problematic given the research that suggests that migrant status, family income level, and place of residence within Ulaanbaatar create overlapping and interdependent systems of disadvantage, which are likely to lead migrant, poorer students to drop out of compulsory schooling. As such, aligned with the emerging scholarship on the relationship between education and health in Mongolia, and the overlapping systems of disadvantage cutting across income, housing, and migrant status with respect to health and educational outcomes, the need for studies exploring determinants of health and educational outcomes in Ulaanbaatar is essential for healthy development of children and youth living in the city.

The Present Study

Years of formal schooling completed is one of the strongest correlates of good health (Cutler & Lleras-Muney, 2010; Grossman, 1976; Heckman, Humphries, & Veramendi, 2014), a relationship that has been documented in a number of developed as well as developing nations (Mustard, et al. 1997; Manor, et al. 1999; Shkolnikov, et al. 1998; Hurt, et al. 2004; Khang et al. 2004; Liang, et al. 2000). Not surprisingly, disparities in health and in educational achievement

are closely linked (Freudenberg, & Ruglis, 2007). It is equally well-evidenced that neighborhoods and housing have influence on both health (Truong & Ma, 2006; Sampson, Morenoff, & Gannon-Rowley, 2002), and education-related outcomes (Leventhal, & Brooks-Gunn, 2000; Johnson, 2012). As such it is important to examine health, education, and neighborhood variables in relation to each other. The current research examines differences in health and education-related outcomes between residents of different administrative districts and housing types in Ulaanbaatar. Neighborhoods can be defined and identified based on a variety of structural characteristics such as average income, extent of neighborhood poverty, residential instability, male joblessness, among others (Leventhal & Brooks-Gunn, 2000). In this study, neighborhoods in Ulaanbaatar are defined in terms of the nine administrative districts and the different dwelling types of households.

Current literature on secondary education in Mongolia mainly focuses on urban to rural inequities in access and quality of education. Namely, low levels of access and quality of education in rural areas compared to urban areas. Although urban-rural inequities in educational outcomes remain an issue, the situation in Ulaanbaatar, which often gets labelled as an urban location and gets compared to rural areas, warrants attention. Given that Ulaanbaatar is a diverse city accounting for 42% of the population in Mongolia (of which 60% live in *ger* districts*)*, and the fact that returns to education and hence the consequences of dropping out are much higher in Ulaanbaatar than in rural areas (Pastore, 2016), it is important to look at the inequities in Ulaanbaatar as its own geographic unit of comparison.

As shown in the health literature on Mongolia discussed in the sections above,

differences in health outcomes within Ulaanbaatar based on dwelling type and residential area are relatively well-established (Jadambaa et al., 2015; Lindskog, 2014; Lhamsuren et al., 2012; Terbish & Rawstorne, 2016). Young people growing up in *ger* neighborhoods, which lack infrastructure for healthy living in the city such as roads, connection to central heating, water supply, and sanitation facilities (Byambadorj et al., 2011), are likely to be less healthy now and in future. The unhealthy environment in *ger* districts coupled with discriminatory practices in schools in these areas (del Rosario, 2005; Batbaatar et al., 2005) are likely to result in higher dropout rates leading to lower educational attainment which in turn results in involvement in low paying occupations and poor working conditions, setting up education as a determinant of poor health.

Research Question

Although previous literature examined differences in dropout rates between migrants and non-migrants in Ulaanbaatar, no study to date has investigated differences between districts or dwelling types which would make the spatial and social inequity within Ulaanbaatar more explicit. As such, I explore the following research question: *Does district/dwelling type influence education and health-related outcomes for children and youth in Ulaanbaatar?*

Based on the current literature, I hypothesize that the structural barriers to quality education for children living in *ger* districts*/ger* dwellings will be captured in lower rates of school attendance and unfavorable health outcomes. School attendance in the year of the interview was investigated as an educational outcome, as non-attendance is predictive of graduation and obtaining a high school certificate (del Rosario, 2005). Child mortality and

antenatal care were examined as the health variables in the current study because child mortality is a core indicator for child health and well-being (United Nations Children's Fund, 2015) and antenatal care ensures women's health during pregnancy, and can reduce the risk of maternal and infant deaths during delivery (AbouZahr & Wardlaw, 2001). Geographical comparison within Ulaanbaatar would lay the groundwork for neighborhood effects research on health and education outcomes of young people in Ulaanbaatar.

Education-related hypotheses. H1: For household members aged 6-18 years, those who live in *ger* districts (i.e., *gers* and single family houses) will have lower school attendance rates compared to those who live in apartment districts (i.e., apartments/condominiums).

H2: For household members aged 6-18 years, those living in administrative districts with higher proportion of *ger* districts (i.e., *ger*s and single family houses) will have lower school attendance rates compared to those living in administrative districts with higher proportion of apartment districts.

H3: For household members aged 6-18 years, type of dwelling will be a significant predictor of school attendance controlling for age, gender, and mother's educational attainment such that school attendance will be higher among apartment dwellers than among *ger* and single family house dwellers.

Health-related hypotheses. H4: For women aged 15-49, the proportion of women who report child deaths will be higher within *ger* districts (i.e., *gers* and single family houses) compared to apartment districts (i.e., apartments/condominiums).

H5: For women aged 15-49, those living in administrative districts with higher proportion

of *ger* districts (i.e., *ger*s and single family houses) will report more child deaths compared to those living in administrative districts with higher proportion of apartment districts.

H6: For women aged 15-49, the proportion of women who report they received no antenatal care will be higher within *ger* districts (i.e., *gers* and single family houses) compared to those living in apartment districts (i.e., apartments/condominiums).

H7: For women aged 15-49, the proportion of women who report they received no antenatal care will be higher in administrative districts with higher proportion of households living in *ger* districts compared administrative districts with higher proportion of households living in apartment districts.

Method

Data

The analysis in this study is based on data extracted from the Multiple Indicator Cluster Survey (MICS) 2013 conducted by the National Statistical Office of Mongolia (NSOM) in collaboration with the United Nations Children's Fund (UNICEF) and the United Nations Population Fund (UNFPA) (NSOM, 2015). The MICS has been carried out in Mongolia every 4 years since 1996, and data are collected on a range of topics, including health, education, social protection, well-being, and rights of children and women, with the objective of producing comparable data across time, in relation to other countries, and goals outlined in the *A World Fit For Children 2002*, Millennium Development Goals and the Mongolian National Programme of Action for the Development and Protection of Children 2002-2010. As such, it is an important source of information for policymakers, planners, program managers, and international

organizations in Mongolia.

The 2012 official statistics of the household registration were used as a sampling frame (NSOM, 2015). A multi-stage, stratified cluster sampling approach was used to select the survey sample. The urban and rural areas within each of the five regions in the country (Western, Khangai, Central, Eastern, Ulaanbaatar) were identified as the main sampling strata, and the sample was selected in two stages. At the first stage the primary sampling units (PSUs) were *khesegs* in Ulaanbaatar and *baghs* in the remaining *aimags*. The PSUs within each stratum were selected systematically with probability proportional to size. After a household listing was carried out in the sample PSUs during the period of May - July 2013, a systematic sample of 25 households was selected within each sample PSU. A total of 15,500 households were selected, and 14,805 successfully interviewed at the national level. The analysis in the current study will be limited to 5,500 households sampled from Ulaanbaatar region.

The household surveys consisted of four sets of questionnaires: 1) a household questionnaire which was used to collect basic demographic information on all household members, and the dwelling; 2) a questionnaire for individual women administered in each household to all women aged 15-49 years; 3) a questionnaire for individual men administered in every second household to all men aged 15-54 years; and 4) an under-5 questionnaire, administered to mothers (or caretakers) for all children under 5 living in the household. Overall, the response rates were 98.5%, 93.9%, 89.9%, and 97.2% for households, individual women, individual men, and individual children under 5 respectively.

Data collection took place from September through December of 2013. Trained personnel

went from household to household conducting in-person interviews using the questionnaire materials. Data was recorded using tablet PC's which enabled field workers to send the data to the central office immediately and ensured that information collected was of high quality (NSOM, 2015).

Participants

A total of 5,500 households or 17,632 individuals were surveyed in Ulaanbaatar, of which 3,604 were children and youth of ages between 6 and 18, and 4,708 were women of ages between 15 and 49 were included in the analysis of the current study.

Questionnaires

The analysis in this study is based on data from two MICS questionnaires, the Household Questionnaire and the Questionnaire for Women Aged 15 to 49. The specific questions selected from each questionnaire are listed below.

Household questionnaire. From the household questionnaire (see Appendix A), responses to the following questions were examined. Responses were dichotomous to the first question, and categorical to the second and third questions. Maternal educational attainment categories were transformed into a dichotomous variable with none, primary, and basic grouped as one level, and upper secondary and above as another variable.

1. *During the 2013/2014 school year, did (name) attend school or pre-school at any time?*
2. *Type of dwelling* was observed by the interviewers and recorded as one of the following: *ger*, apartment/condominium, convenient single family house, single family house, public accommodation/dormitory, and other.

3. *Maternal educational attainment* was recorded as one of the following: none, primary, basic (lower secondary), upper secondary, vocational, college/university, cannot be determined, or missing.

Questionnaire for women aged 15-49. From the women's questionnaire (see Appendix B), the following items were analyzed. Responses to both questions were dichotomous.

1. *Did you see anyone for antenatal care during your pregnancy with (name)?*

2. *Have you ever given birth to a child who was born alive, but later died?*

Procedure

The data were entered into a Statistical Package for the Social Sciences (SPSS) by NSOM and the data files were freely available at www.unicef.org and www.1212.mn. There were two SPSS data files associated with the Household Questionnaire, and one SPSS data file associated with the Questionnaire for Women. The three SPSS datasets available through UNICEF and NSOM were: (1) an individual-level dataset with information on school attendance for household members aged 6 to 18, and maternal educational attainment, (2) a household-level dataset with information on household dwelling type and administrative district, and (3) an individual-level dataset for women aged 15 to 49 with reproductive health information. In order to examine the differences in health and educational outcomes across dwelling types and administrative districts, the household-level dataset with the dwelling type information was merged with each of the other two individual-level datasets based on the cluster and the household numbers. A series of chi-square tests of homogeneity and a binomial logistic regression was conducted to examine group differences in education and health-related outcomes

across dwelling types and administrative districts.

Results

Sample Sizes in Each Dwelling Type and Each Administrative District

Prior to testing the hypotheses relating to differences in educational and health outcomes across dwelling types and administrative districts, descriptive analyses pertaining to the dwelling type and administrative districts in Ulaanbaatar were conducted. It was found that out of the 5,500 households sampled from Ulaanbaatar in 2013, 21.6% of households lived in *gers*, 35.8% lived in apartments or in condominiums, and 32.3% lived in single family houses. Only 1.6% of households lived in convenient single family houses, and 1.6% of households lived in public accommodation/dormitories. As the sample sizes for households living in convenient single family houses and public accommodation and dormitory were not sufficient, these households were excluded from the hypothesis testing analyses. Wealth levels of the households among different dwelling types were also explored. The household-level dataset contained wealth indexes for each household which were estimated using information such as source of drinking water (e.g., piped water, borehole, or dug well), type of sanitary facility (e.g., flush toilet, pit latrine, or mobile latrine), housing type and materials (e.g., earth, sand, soil, dung, wood planks, or concrete), availability of electricity, and household assets (e.g., television, refrigerator, and washing machine). Households were then divided into five quintiles based on their wealth index and ordered from the poorest to the richest. Although wealth quintiles take into account the dwelling type information, which results in some overlap between the measures of wealth index and dwelling type, there is likely to be some variation in terms of wealth within each dwelling

type. As seen in Table 1, wealth distribution varied by dwelling type such that the majority of *ger* dwellers (66%) fell into second to the poorest wealth quintile, the majority of dwellers of single family houses (63%) fell into second to the richest wealth quintile, and the majority of apartment/condominium dwellers (89%) were in the highest wealth quintile.

Table 1

Wealth Quintiles Frequency Distribution by Dwelling Type

Wealth index	Type of dwelling		
	Ger dwelling	Apartment/ Condominium	Single family house
Poorest	4%	0%	0%
Second	66%	0%	1%
Middle	30%	0.1%	35%
Fourth	1%	11%	63%
Richest	0%	89%	1%

Next, the sample sizes of the administrative districts, and the proportion of households living in various types of dwelling were explored. Table 2 provides information on the number of households and individuals sampled from each administrative district in Ulaanbaatar, and Table 3 provides information on the proportion of households in each type of dwelling. As can be seen from Table 3, the administrative districts vary in terms of the proportions of households living in *gers*, apartments, and single family houses. The three districts with the highest proportion of households living in *gers* were Bagakhangai, Baganuur, and Songinokhairkhan. The three districts with the highest proportion living in apartments were Bayangol, Baganuur, and Khan-Uul.

Table 2

Number of Households and Respondents in Each Administrative District

District/Duureg	Number of sub-districts/khoroos	Number of households	Number of respondents
Baganuur*	4*	125*	391*
Bagakhangai*	1*	25*	71*
Bayangol	23	850	2560
Bayanzurkh	28	1325	4150
Nalaikh*	5*	150*	518*
Songinokhairkhan	31	1150	3987
Sukhbaatar	19	625	1854
Khan-Uul	15	575	1872
Chingeltei	19	675	2229
Total	145	5500	17632

Note: *These districts were separate cities prior to 1992. They are relatively smaller in size, and are more distanced from the center of Ulaanbaatar.

Table 3

Proportion of Households in Each Dwelling Type by Administrative District

	Households living in:				
District/Duureg	Ger	Apartment, condominium	Single family house	Convenient single family house	Public accommodation, dormitory
Baganuur*	30%	48%	14%	0%	3%
Bagakhangai*	48%	36%	4%	0%	0%
Bayangol	11%	69%	11%	0.4%	1%
Bayanzurkh	25%	31%	31%	4%	2.3%
Nalaikh*	27%	32%	39%	0.0%	1.3%
Songinokhairkhan	28%	22%	41%	1.3%	0.8%
Sukhbaatar	20%	39%	31%	0.8%	0.8%
Khan-Uul	16%	41%	31%	0.9%	3.3%
Chingeltei	20%	18%	53%	1.2%	0.4%

Do School Attendance Rates Differ across Dwelling Types?

In order to test the first hypothesis, which was that for household members aged 6-18 years, *ger* dwellers will have lower school attendance rates compared to *non-ger* dwellers (i.e. single family house and apartment/condominium) a chi-square test of homogeneity was conducted to examine school attendance rates in household members aged 6-18 across dwelling types. It was revealed that 5.1% of youth between the ages of 6 and 18 living in *gers* (n=47) did not attend school in the 2013-2014 academic year compared to 1.2% of youth living in apartment/condominium (n=15) and 3.8% of those living in single family housing (n=49). These differences in proportions were found to be statistically significant, $\chi 2(4) = 29.93$, $p<.001$. Post-hoc analysis involved pairwise comparisons using the z-test of two proportions with a Bonferroni correction. The proportion of children and youth living in *gers* and single family houses who did not attend school in the survey year was significantly higher than those who lived in apartments and condominiums, $p<.05$. There was no statistically significant difference in school attendance between children and youth living in *gers* and those living in single family houses, $p>.05$.

As an age range of 6 to 18 is quite large, and based on previous literature establishing a positive association between age and school leaving (Boyle et al., 2002), it was expected that attendance rates would be lower for older children. An independent samples t-test was run to examine if there was a significant difference in age between respondents who attended or did not attend school in the year of the interview. The mean age of those who were attending school was 11.78 (SD=3.73) years whereas those who were not attending school had a mean age of 16.50 (SD=2.47) years. There was a statistically significant difference between the two groups, t

(3581)=13.33, p<.001.

Given this demonstrated effect of age on school attendance, a chi-square test of homogeneity was conducted for attendance rates exclusively for 14 to 18-year-olds across dwelling types. It was revealed that 14% of youth between the ages of 14 and 18 living in *gers* (n=45) did not attend school in the 2013-2014 academic year compared to 3% of youth living in apartment/condominium (n=14) and 9% of those living in single family housing (n=46), a statistically significant difference in proportions, $\chi 2(4) = 31.53$, p<.001. Post-hoc analysis involved pairwise comparisons using the z-test of two proportions with a Bonferroni correction. The proportion of children and youth living in *gers* and single family houses who did not attend school in the survey year was significantly higher than those who lived in apartments and condominiums, p<.05. There was no statistically significant difference in school attendance between proportions of children and youth living in *gers* and those living in single family houses, p>.05.

Do School Attendance Rates Differ across the Nine Administrative Districts in Ulaanbaatar?

In order to test the second hypothesis that for household members aged 6-18 years, those living in administrative districts with higher proportion of *ger* dwellings and single family houses will have lower school attendance rates compared to those living in administrative districts with higher proportion of households living in apartments, a chi-square test of homogeneity was conducted to examine differences in attendance rates between the nine districts, which vary in terms of their *ger* district population (see Table 3). The differences in

binomial proportions for the nine districts were not statistically significant, $\chi 2(8) = 10.36$, $p=.241$.

Is Dwelling Type a Significant Predictor of School Attendance when Accounting for Age, Sex, and Maternal Education?

A binomial logistic regression was performed in order to ascertain the effects of household dwelling type when accounting for age, sex, and maternal education on the likelihood of school attendance in children and youth aged 6 to 18 - the third education-related hypothesis. Prior to running binomial logistic regression, preliminary analyses were run to examine the relationship between the independent variable (school attendance rates) and dependent variables, (age, sex, maternal educational attainment, and dwelling type). Chi-square test of homogeneity on sex revealed that boys (4.3%) were significantly less likely to be attending school than girls (1.9%), $\chi 2(1) = 16.81$, $p < .0005$. The same test, run when accounting for mother's educational attainment, revealed that there was no difference in school attendance whether or not the mother had an upper secondary education or above, $p>.05$. Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell (1962) procedure. A Bonferroni correction was applied using all eight terms in the model resulting in statistical significance being accepted when $p < .005$ (Tabachnick & Fidell, 2007). Based on this assessment, the continuous variable, age, was not linearly related to the logit of the dependent variable. There were 22 studentized residuals with a value of more than two which were included in the analysis. The logistic regression model was statistically significant, $\chi 2(7) = 115.940$, $p < .0005$. The model explained 23.0% (Nagelkerke R^2) of the variance in school attendance and

correctly classified 98.3% of cases. Sensitivity was 100%, specificity was 0%, positive predictive value was 98.3% and negative predictive value was 0%.

Of the four predictor variables, three were statistically significant: age, sex, and dwelling type (as shown in Table 4). For every one point increase in age, the odds of someone not attending school are increased by 1.652. In other words, as children grow older, the odds of not attending school increase. Values less than 1.000 indicate decreased odds for an increase in one unit of the independent variable. Being a girl had odds of not attending school that are .48 of the odds of being a boy. In other words, boys were significantly less likely to be attending school. A respondent whose family was dwelling in apartment had odds of not attending school that were .164 of the odds of someone living in a *ger*. A respondent whose family was dwelling in single family house had odds of not attending school that were .526 of the odds of someone who was living in a *ger.* In other words, compared to youth whose families lived in *gers* the odds of not attending school in the year the interview decreased by half for youth whose families lived in single family houses, and by more than 80% for youth whose families lived in apartments.

The association between maternal educational attainment and school attendance was explored using a chi-square test of homogeneity, and it was revealed that 70.3% of mothers living in *gers* (n=581) had an upper secondary education or above compared to 97.2% of mothers living in apartment/condominium (n=1,073) and 84.6% of those living in single family housing (n=969), a statistically significant difference in proportions, $\chi 2(4) = 278.80$, $p<.001$. Post-hoc analysis involved pairwise comparisons using the z-test of two proportions with a Bonferroni correction. The proportion of household heads in *gers* who had upper secondary education and

above was lower than those in single family houses, which in turn was lower than of those in apartments and condominiums, $p<.05$.

Table 4

Logistic Regression Predicting Likelihood of School Attendance based on Age, Sex, Maternal Education, and Dwelling Type

	B	*S.E.*	Wald	*df*	*p*	Exp(B)
Age	.50	.07	50.99	1	.000	1.648
Sex	-.74	.30	6.11	1	.013	.476
Maternal education	-.36	.36	1.04	1	.308	.696
Dwelling type			15.41	4	.004	
Apartment	-1.81	.47	14.68	1	.000	.164
Convenient family house	-17.88	4724.75	0.00	1	.997	.000
Single family house	-.64	.31	4.27	1	.039	.526
Public accommodation	-17.61	4989.84	0.00	1	.997	.000

Note: Sex is for females compared to males. Dwelling type comparisons were in relation to *gers*.

Are There Differences in Child Mortality Rates across Dwelling Types?

In order to test the fourth hypothesis, a chi-square test of homogeneity was conducted to examine differences in child mortality across dwelling types, and it was revealed that 6.7% of women between the ages of 15 and 49 living in *gers* (n=73) reported that they had a child who later died compared to 2.5% of women living in apartment/condominium (n=45) and 5.2% of

those living in single family housing (n=86), a statistically significant difference in proportions, $\chi 2(5) = 35.88$, $p<.001$. Post-hoc analysis involved pairwise comparisons using the z-test of two proportions with a Bonferroni correction. The proportion of women between the ages of 15 and 49 living in *gers* and single family houses who reported child death was significantly larger than that of women living in apartments and condominiums, $p<.05$. There was no statistically significant difference in proportions between *ger* and single family house dwellers, $p>.05$.

Are There Differences in Child Mortality Rates across the Nine Administrative Districts?

The fifth hypothesis was tested using a chi-square test of homogeneity which examined differences in child mortality across the nine districts and it was found that there was no significant differences in proportion of child mortality rates across the nine districts, $p>.05$. Post-hoc analysis involved pairwise comparisons using the z-test of two proportions with a Bonferroni correction. It was found that only two administrative districts significantly differed in proportions of child mortality. Specifically, 3.2% of women living in Bayangol district (n=23) reported that they had a child who later died compared to 9.4% of women living in Nalaikh district (n=12) thereby partially supporting the hypothesis. As was seen in Table 3, Bayangol district was the district with the highest proportion of residents living in apartments, whereas Nalaikh was the district with the highest proportion of residents living in *gers*.

Does the Antenatal Care Received by Women Differ across Dwelling Types?

The sixth hypothesis was tested using a chi-square test of homogeneity which examined group differences across dwelling types in antenatal care received by women who gave live birth within two years preceding the date of interview, and it was revealed that the majority (>94%) of

women residing in all types of dwellings reported that they received antenatal care during their pregnancy, resulting in insufficient cell count in cross-tabulation which led to the failure to meet the test assumptions. Hence, due to general high rate of the antenatal care received by women, the rates were not explored by administrative districts.

Discussion

The aim of the current study was to examine differences in health and educational outcomes across housing types and administrative districts in Ulaanbaatar. First, investigating the effects of neighborhoods is important given their vital role for both education and health (Stafford & McCarthy, 2006; Leventhal & Brooks-Gunn, 2000), and the positive relationship between educational attainment and health. As such, neighborhoods may have an influence on health both directly *and* indirectly via influencing educational outcomes. Second, given the complexities of identifying and defining neighborhoods (Diez Roux, 2001), in the current study neighborhoods were operationalized in two ways: (1) an administrative district as a neighborhood, and (2) housing type as a proxy for neighborhood socioeconomic status.

The findings outlined in this study contributes to the sparse literature on *ger* districts in Ulaanbaatar by directly comparing *ger* district residents' health and educational outcomes to those living in apartment/condominium districts. As such, the present study also extends the discourse on marginalization of the rural populations in Mongolia in terms of favorable health and educational outcomes by way of investigating the spaces that are occupied by increasingly "rural" populations in the "urban" location of Ulaanbaatar (Lindskog, 2014; Mayer, 2016).

Analyses by Housing Type

There are three main types of housing in Ulaanbaatar: *gers,* apartments/condominiums, and single family houses. *Gers* and houses combine to make up the *ger* districts in Ulaanbaatar which can be characterized by a lack of access to basic infrastructure (Byambadorj et al., 2011). The examination of wealth levels of households living in different dwelling types has shown that apartment/condominium dwelling households are the most advantaged, followed by single family house dwelling households, with households dwelling in *gers* faring the worst in terms of wealth indices (Table 1). Therefore, housing type is evidently a close proxy of one's socio-economic status in the context of Ulaanbaatar, which is consistent with literature on income levels, and social capital and the structure of inequality in Ulaanbaatar (Choi, 2012; Johnson, 2008). Although households living in single family houses may seem better off in terms of wealth than households living in *gers*, it remains that they share similar experiences in terms of the surrounding neighborhood physical environment and health and educational facilities as evidenced in the review of *ger* districts in Ulaanbaatar (Batbaatar et al., 2005; del Rosario, 2005; Lindskog, 2014; Jadambaa et al., 2015). The analyses of differences in education and health-related outcomes conducted in the current study support this conclusion.

For example, the proportions of children and youth who did not attend school in the year of the interview living in *gers* (5.2%) and single family houses (3.8%) did not significantly differ from each other, and were higher than the proportion among the apartment (1.2%) dwellers. A similar pattern was observed for the child mortality rate, such that apartment dwelling (2.5%) women reported significantly lower rates compared to *ger* (6.7%) and single family house

(5.2%) dwellers, which did not significantly differ from one another. In other words, regardless of whether the household lives in a *ger* or a single family house, living in the *ger* district is associated with lower school attendance and higher child mortality outcomes compared to living in apartment district.

Analyses by Administrative Districts

School attendance rates were not significantly different based on the administrative district (*duureg*) level, and the hypothesis pertaining to child mortality was partially supported such that the district with the highest proportion of apartment districts (Bayangol) having significantly higher child mortality rates (9.4% vs 3.2%) than the district with one of the highest proportions of *ger* districts (Nalaikh). Otherwise, the lack of significant findings with regards to administrative districts may be due to the fact that administrative districts may be too broad a delineation of neighborhoods for the context of Ulaanbaatar. Administrative districts combine both *ger* ***and*** apartment districts, albeit to differing degrees. Neighborhoods can be thought of as nested ecological community units (Sampson et al., 2002) and as such bureaucratically defined units such as the administrative district (*duureg*) may not capture the complexities of different communities and neighborhoods within it.

School Attendance Analyses

In line with prior research done in Mongolia (Steiner-Khamsi & Gerelmaa, 2009; NSOM, 2015), this study found that boys are more likely to be out of school than girls, and that the likelihood of not attending school increased by a factor of 1.652 with one year increase in age. However, contrary to the findings of Pastore (2010; 2016) maternal education was not

significantly associated with children's likelihood of attending school. The current analysis revealed that age, sex, and housing type were significant predictors of school attendance controlling for the other variables, whereas maternal education level was not. Compared to *ger* dwellers the odds of attending school were greater for single family house dwellers and even more so for apartment dwellers. Maternal educational levels significantly differed by housing type such that 97% of apartment dwelling mothers had upper secondary education and above compared to 85% of mothers living in single family houses and 70% of mothers living in *gers.* This suggests that the institutional resources that are organized around neighborhoods in Ulaanbaatar may play a much more important role than individual factors such as parents' educational attainment in the educational outcomes of children and youth in these neighborhoods.

Child Mortality and Antenatal Care

Child mortality. Infant mortality was the only outcome measure for which there were differences between administrative districts, specifically Bayangol and Nalaikh. As mentioned previously, Nalaikh is was a separate city prior to 1992 and is physically more distant from the rest of Ulaanbaatar. Nalaikh is also much smaller in population than Bayangol. In fact, in the MICS survey the sampling method was probabilities proportional to size, and 150 households were sampled from Nalaikh, and 850 from Bayangol. Child mortality rate was three times higher in Nalaikh (9.4%) compared to Bayangol (3.2%). It is noteworthy that 69% of Bayangol residents live in apartments compared to only 32% of Nalaikh residents (Table 3). Although the difference in child mortality could potentially be attributed to the proportion of apartment and

ger districts in Bayangol and Nalaikh, it could be argued that the difference was due to unequal sample sizes and margins of errors. As for housing type analyses, compared to apartment dwellers, occurrence of child death was twice as high for women who lived in single family houses (5.2%), and three times as high for women who lived in *gers* (6.7%).

Antenatal care. The majority of women (>94%) reported that they saw someone for antenatal care during their pregnancy in the two year prior to the interview year. As such, this outcome measure may not have been sensitive to differences between housing types or administrative districts. Other possible outcome measures include the number of visits, the type of health professional visited, and the timing of the first visit.

Limitations

First, although the associations between dwelling type, school attendance rate and infant mortality rate were significant, it must be considered that these are merely associations. The current study is ecologic in nature such that variations in health and educational outcomes were examined across areas where dwelling types were used as proxies to areas (Diez Roux, 2001). The major limitation of the current study is that it cannot be concluded that type of dwelling affects educational and health outcomes above and beyond individual characteristics, as individual characteristics, such as family income, economic hardship, and home ownership, were not included in the analysis (Ross & Mirowsky, 2008; Leventhal & Brooks-Gunn, 2002). Future research in this field should take into account a comprehensive set of individual and family-level socio-economic variables in the analysis in order to fully establish neighborhood effects in Ulaanbaatar.

Second, it should be noted that maternal education level was analyzed as a dichotomous variable whereas upper secondary education and above were grouped as one level, with levels below upper secondary grouped as another level. Including more than two levels of maternal educational attainment variable may be more insightful in the effort to ascertain its' effect on children and young people's educational outcomes. In fact, Pastore (2016) included eight levels of maternal educational attainment in his analysis of the association between children's probability of dropping out and maternal educational attainment in Mongolia.

Third, school attendance rates, child mortality, and antenatal care visits were the only education and health-related variables that were examined in the study. Whereas school attendance rates and child mortality rates differed by housing type, antenatal care was generally at high levels and did not differ across housing types. Future research investigating a variety of health and education-related variables and replicating these findings is needed in order to ascertain neighborhood effects on health and educational outcomes.

Lastly, as mentioned previously comparison across the nine administrative districts (*duuregs*) in Ulaanbaatar may have been too broad. In Ulaanbaatar, *duuregs* are further sub-divided into 152 *khoroos* which are further sub-divided into *khesegs* (NSOM, 2013). Defining neighborhoods based on these smaller sub-divisions may better capture neighborhood characteristics such as physical environment, amenities, and social capital (Stafford & McCarthy, 2006).

Implications

Notwithstanding its' limitations, this study has contributed to knowledge about distribution of adverse health and educational outcomes across different housing types and hence neighborhoods in Ulaanbaatar. Specifically, individuals living in *ger* neighborhoods were at heightened risk of poor health and educational outcomes. There are several policy implications with regards to improving health and educational outcomes in *ger* districts, which are improved economic condition of residents, infrastructure, physical environment, institutional resources, and social environment (drawn from Stafford & McCarthy, 2006; Leventhal & Brooks-Gunn, 2000). *Ger* district residents need to be better connected with other parts of the city in order to fully participate in social and economic life in the city (Choi, 2012). Additionally, waste management, hygiene, sanitation, contamination of water and soil, and air pollution are the most pressing issues in terms of physical environment that need urgent solutions. Institutional resources, such as child care, schools, and medical facilities, need to be not only available to *ger* district communities but also easily accessible, affordable, and of high quality. Building stronger community ties and networks within *ger* neighborhoods would also be beneficial for residents' health and educational outcomes.

Conclusions and Future Directions

Despite the limitations outlined above, this research makes a significant contribution to the existing literature on *ger* districts in Ulaanbaatar. Specifically, in making use of a nationally representative dataset that contains information both on housing type and a variety of health and education indicators, the study has found significant variations in educational and health

outcomes between *ger* and apartment districts in Ulaanbaatar. Given the role of neighborhoods as central to both health and education, the results from the current study suggest that children and youth in *ger* districts may be at heightened risk of poor educational as well as health outcomes. Furthermore, within *ger* districts those living in *gers* may be at even greater risk of adverse health and educational outcomes than those living in single family houses. In addition, the significant association between educational attainment and health (Cutler & Lleras_Muney, 2006) would mean that young people in *ger* districts are likely to be unhealthy not only now, but also in future, by way of influence of educational attainment (or lack thereof). Given the fact that more than 60% of Ulaanbaatar's population reside in *ger* districts (NSOM, 2013) this is of serious concern for the population health of this region.

Furthermore, future research should investigate the possible pathways and mechanisms by which housing type leads to adverse health and educational outcomes in Ulaanbaatar. In other words, research should move from simple associations to testing possible explanatory pathways which may include social-relational characteristics such as social capital, social cohesion, and social control. Furthermore, it is important not to study *ger* districts solely through a deficit-lens - attention should be paid to the cultural richness and community capacities of *ger* districts which may act as protective factors (Terbish & Rawsthorne, 2016).

In conclusion, future research should include a comprehensive set of individual and family-level socioeconomic variables in the analysis, include a variety of outcome measures, and move from simple associations to study of possible explanatory mechanisms that lead to different outcomes based on neighborhood characteristics. In so doing, future research will lead

to a better understanding of the determinants of health and well-being affecting Mongolian children and young people in the country's most populated region.

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Appendix A

Household Questionnaire

Approved by Resolution #... of the Chairman of the National Statistical Office of Mongolia. **Form SISS-1**

SOCIAL INDICATOR SAMPLE SURVEY

HOUSEHOLD QUESTIONNAIRE
Mongolia

1. HOUSEHOLD INFORMATION PANEL	**HH**
HH1. Cluster number: ___ ___ ___	**HH2.** Household number: ___ ___
HH2A. Name of household head Name _____	**HH2B.** Street name and number of khashaa/ door _____
HH3. Interviewer's name and number Name _____ ___ ___	**HH4.** Supervisor's name and number Name _____ ___ ___
HH6. Area: Capital city – 1 Aimag center - 2 Soum center – 3 Rural - 4	**HH7A.** Aimag/ city name and code Name _____ ___ ___
HH7B. Soum/ District name and code Name _____ ..... ___ ___	**HH7C.** Bag/ Khoroo name and code Name _____ ___ ___
HH7D. Kheseg name and code Name _____ ..... ___ ___	**HH8.** Is the household selected for Questionnaire for Men? Yes .....1 No 2

WE ARE FROM THE NATIONAL STATISTICAL OFFICE OF MONGOLIA AND CONDUCTING A SURVEY ABOUT THE SITUATION OF CHILDREN, WOMEN, FAMILIES AND HOUSEHOLDS. I WOULD LIKE TO TALK TO YOU ABOUT THESE SUBJECTS NEARLY 40 MINUTES. ACCORDING TO THE ARTICLE 5, PARAGRAPH 4 OF THE MONGOLIAN STATE "LAW ON CONFIDENTIALITY OF AN INDIVIDUAL" AND ARTICLE 22, PARAGRAPH 3 OF THE "LAW ON STATISTICS" ALL THE INFORMATION WE OBTAIN WILL REMAIN STRICTLY CONFIDENTIAL.
MAY I START NOW?

- *Yes, permission is given ⇨ Go to HH18 to record the time and then begin the interview.*
- *No, permission is not given ⇨ Circle 04 in HH9. Discuss this result with your supervisor.*

Date and result of the interview:

Number of times visited	**HH5. Year/Month/Day of interview**	**HH9. Result of the interview***
1. First	*2013* / ___ ___/ ___ ___	___ ___
2. Second	*2013* / ___ ___/ ___ ___	___ ___
3. Third	*2013* / ___ ___/ ___ ___	___ ___

Result of household interview:
Completed 01
No household member or no competent respondent at home at time of visit 02
Entire household absent for extended period of time 03
Refused 04
Dwelling vacant/ Address not a dwelling 05
Dwelling destroyed 06
Dwelling not found 07
Other (*specify*) _____ 96

After the household questionnaire has been completed, fill in the following information:	
HH10. Respondent to household questionnaire: Name _____ ___ ___	
HH11. Total number of household members: ___ ___	*After all questionnaires for the household have been completed, fill in the following information:*
HH12. Number of women age 15-49 years: ___ ___	**HH13.** Number of women's questionnaires completed: ___ ___
If the household is selected for Questionnaire for Men: **HH13A.** Number of men age 15-54 years: ___ ___	*If the household is selected for Questionnaire for Men:* **HH13B.** Number of men's questionnaires completed: ___ ___
HH14. Number of children under age 5: ___ ___	**HH15.** Number of under-5 questionnaires completed: ___ ___

HH.1

HH18. *Record the time.*

Hour..... __ __

Minutes..... __ __

2. LIST OF HOUSEHOLD MEMBERS **HL**

FIRST, PLEASE TELL ME THE NAME OF EACH PERSON WHO USUALLY LIVES HERE, STARTING WITH THE HEAD OF THE HOUSEHOLD.

List the head of the household in line 01. List all household members (HL2), their relationship to the household head (HL3), and their sex (HL4)

Then ask: ARE THERE ANY OTHERS WHO LIVE HERE, EVEN IF THEY ARE NOT AT HOME NOW?

If yes, complete listing for questions HL2-HL4. Then, ask questions starting with HL5 for each person at a time.

Use an additional questionnaire if all rows in the List of Household Members have been used.

							For women age **15-49**	*For men age* **15-54**	*For children age* **0-4**	I WOULD LIKE TO ASK YOU SEVERAL QUESTIONS ABOUT NATURAL PARENTS OF CHILDREN AGED 0-17. PLEASE DO NOT TAKE IT SERIOUSLY SINCE THESE QUESTIONS WILL BE USED ONLY FOR THE SURVEY. *For children age* ***0-17*** *years*						*For children age* **0-14**
HL1	**HL2**	**HL3**	**HL4**	**HL5**		**HL6**	**HL7**	**HL7A**	**HL7B**	**HL11**	**HL12**	**HL12A**	**HL13**	**HL14**	**HL14A**	**HL15**
Line no.	*Name*	WHAT IS THE RELATION-SHIP OF (*name*) TO THE HEAD OF HOUSE-HOLD?	IS (*name*) MALE OR FEMALE? 1 Male 2 FEMALE	WHAT IS (*name*)'S DATE OF BIRTH? 9998 DK 98 DK		HOW OLD IS (*name*)? *Record in completed years. If age is 95 or above, record '95'*	*Circle line no. if woman age* **15-49**	*Circle line no. if man age* ***15-54*** *and the house-hold is selected for Questionnaire for Men*	*Circle line no. if age* **0-4**	IS (*name*)'S NATURAL MOTHER ALIVE? 1 Yes 2 No ⇘ HL13 8 DK ⇘ HL13	DOES (*name*)'S NATURAL MOTHER LIVE IN THIS HOUSE-HOLD? *If "Yes" Record line no. of mother and go to HL13 Record 00 for "No"*	WHERE DOES (*name*)'S NATURAL MOTHER LIVE? 1 In another household in this country 2 Institution In this country 3 Abroad 8 DK	IS (*name*)'S NATURAL FATHER ALIVE? 1 Yes 2 No ⇘ HL15 8 DK ⇘ HL15	DOES (*name*)'S NATURAL FATHER LIVE IN THIS HOUSE-HOLD? *If "Yes" Record line no. of father and go to HL15 Record 00 for "No"*	WHERE DOES (*name*)'S NATURAL FATHER LIVE? 1 In another household in this country 2 Institution in this country 3 Abroad 8 DK	*Record line no. of mother from HL12 if indicated. If HL12 is blank, or "00" ask:* WHO IS THE PRIMARY CARETAKER OF (*name*)?
Line	Name	Relation*	M	F	Year	Month	Age	15-49	15-54	0-4	Y N DK	Mother		Y N DK	Father		Mother
01		**0 1**	1	2	__ __ __ __	__ __	__ __	01	01	01	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
02		__ __	1	2	__ __ __ __	__ __	__ __	02	02	02	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
03		__ __	1	2	__ __ __ __	__ __	__ __	03	03	03	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
04		__ __	1	2	__ __ __ __	__ __	__ __	04	04	04	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
05		__ __	1	2	__ __ __ __	__ __	__ __	05	05	05	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
06		__ __	1	2	__ __ __ __	__ __	__ __	06	06	06	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
07		__ __	1	2	__ __ __ __	__ __	__ __	07	07	07	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
08		__ __	1	2	__ __ __ __	__ __	__ __	08	08	08	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
09		__ __	1	2	__ __ __ __	__ __	__ __	09	09	09	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __
10		__ __	1	2	__ __ __ __	__ __	__ __	10	10	10	1 2 8	__ __	1 2 3 8	1 2 8	__ __	1 2 3 8	__ __

							For women age 15-49	For men age 15-54	For children age 0-4	I WOULD LIKE TO ASK YOU SEVERAL QUESTIONS ABOUT NATURAL PARENTS OF CHILDREN AGED 0-17. PLEASE DO NOT TAKE IT SERIOUSLY SINCE THESE QUESTIONS WILL BE USED ONLY FOR THE SURVEY. *For children age **0-17** years*						For children age 0-14
HL1	**HL2**	**HL3**	**HL4**	**HL5**		**HL6**	**HL7**	**HL7A**	**HL7B**	**HL11**	**HL12**	**HL12A**	**HL13**	**HL14**	**HL14A**	**HL15**
Line no.	*Name*	WHAT IS THE RELATION-SHIP OF (*name*) TO THE HEAD OF HOUSE-HOLD?	IS (*name*) MALE OR FEMALE? 1 Male 2 FEMALE	WHAT IS (*name*)'S DATE OF BIRTH? 9998 DK	98 DK	HOW OLD IS (*name*)? *Record in completed years. If age is 95 or above, record '95'*	*Circle line no. if woman age 15-49*	*Circle line no. if man age 15-54 and the household is selected for Questionnaire for Men*	*Circle line no. if age 0-4*	IS (*name*)'S NATURAL MOTHER ALIVE? 1 Yes 2 No → HL13 8 DK → HL13	DOES (*name*)'S NATURAL MOTHER LIVE IN THIS HOUSE-HOLD? *If "Yes" Record line no. of mother and go to HL13 Record 00 for "No"*	WHERE DOES (*name*)'S NATURAL MOTHER LIVE? 1 In another household in this country 2 Institution in this country 3 Abroad 8 DK	IS (*name*)'S NATURAL FATHER ALIVE? 1 Yes 2 No → HL15 8 DK → HL15	DOES (*name*)'S NATURAL FATHER LIVE IN THIS HOUSE-HOLD? *If "Yes" Record line no. of father and go to HL15 Record 00 for "No"*	WHERE DOES (*name*)'S NATURAL FATHER LIVE? 1 In another household in this country 2 Institution in this country 3 Abroad 8 DK	*Record line no. of mother from HL12 if indicated. If HL12 is blank, or "00" ask:* WHO IS THE PRIMARY CARETAKER OF (*name*)?
Line	Name	Relation*	M	F	Year	Month	Age	15-49	15-54	0-4	Y N DK	Mother		Y N DK	Father		Mother
11		___ ___	1	2	____	___	___	11	11	11	1 2 8	___ ___	1 2 3 8	1 2 8	___ ___	1 2 3 8	___ ___
12		___ ___	1	2	____	___	___	12	12	12	1 2 8	___ ___	1 2 3 8	1 2 8	___ ___	1 2 3 8	___ ___
13		___ ___	1	2	____	___	___	13	13	13	1 2 8	___ ___	1 2 3 8	1 2 8	___ ___	1 2 3 8	___ ___
14		___ ___	1	2	____	___	___	14	14	14	1 2 8	___ ___	1 2 3 8	1 2 8	___ ___	1 2 3 8	___ ___
15		___ ___	1	2	____	___	___	15	15	15	1 2 8	___ ___	1 2 3 8	1 2 8	___ ___	1 2 3 8	___ ___

Tick here if additional questionnaire used ■

Probe for additional household members.
Probe especially for any infants or small children not listed, and others who may not be members of the family (such as servants, friends) but who usually live in the household.
Insert names of additional members in the household list and complete form accordingly.

Now for each woman age 15-49 years, write her name and line number and other identifying information in the information panel of a separate Individual Women's Questionnaire.
For each man age 15-54 years, write his name and line number and other identifying information in the information panel of a separate Individual Man's Questionnaire.
For each child under age 5, write his/her name and line number AND the line number of his/her mother or caretaker in the information panel of a separate Under-5 Questionnaire.
You should now have a separate questionnaire for each eligible woman, each eligible man, and each child under five in the household.

* *Codes for **HL3**: Relationship to head of household:*

01 Head
02 Spouse/Partner
03 Son / Daughter
04 Son-In-Law / Daughter-In-Law
05 Grandchild
06 Parent
07 Parent-In-Law
08 Brother / Sister
09 Brother-In-Law / Sister-In-Law
10 Uncle / Aunt
11 Niece / Nephew
13 Adopted / Foster/ Stepchild
14 Servant (Live-in)
15 Grand parent
16 Other relative
96 Other (Not related)
98 DK

3. EDUCATION — ED

			*For household members age **5 and above***				*For household members **age 5-24 years***							
ED1	**ED2**		**ED3**	**ED4A**	**ED4B**	**ED4C**	**ED5**	**ED6**		**ED7**	**ED8**	
Line number	*Name and age* *Copy from HL2 and HL6*		HAS (*name*) EVER ATTENDED SCHOOL OR PRE-SCHOOL? 1 Yes 2 No ⇘ Next Line	WHAT IS THE HIGHEST LEVEL OF SCHOOL (*name*) HAS ATTENDED? Preschool ..... 0⇨ED5 Secondary .....2 Vocational training.....4 Higher .....3 Don't know.....8 *If completed non-formal equivalent education program (NFEEP), circle '2'.*	WHAT IS THE HIGHEST GRADE (*name*) COMPLETED AT THIS LEVEL? Grade: 98 DK *If less than 1 grade at this level, record '00'.* *If has attended primary school of NFEEP, record '21', if basic or high school, record '22' and '23' resprctively.*	HAS (*name*) COMPLETED SCHOOL HE OR SHE HAS ATTENDED? 1 Yes 2 No	DURING THE 2013/2014 SCHOOL YEAR, DID (*name*) ATTEND SCHOOL OR PRESCHOOL AT ANY TIME? 1 Yes 2 No ⇘ ED7	DURING 2013/2014 SCHOOL YEAR, WHICH LEVEL AND GRADE IS (*name*) ATTENDING? Level: Preschool.....0⇨ED7 Secondary .....2 Vocational training.....4 Higher .....3 Don't know.....8	Grade: 98 DK	DURING THE PREVIOUS SCHOOL YEAR, THAT IS 2012/2013, DID (*name*) ATTEND SCHOOL OR PRESCHOOL AT ANY TIME? 1 Yes 2 No ⇘ Next Line 8 DK ⇘ Next Line	DURING THE PREVIOUS SCHOOL YEAR, THAT IS 2012/2013, WHICH LEVEL AND GRADE DID (*name*) ATTEND? Level: Preschool.... 0⇘ Next Person Secondary..... 2 Vocational training.... 4 Higher ..... 3 Don't know..... 8	Grade: 98 DK
Line	Name	Age	Yes No	Level	Grade	Yes No	Yes No	Level	Grade	Yes No DK	Level	Grade
01		__ __	1 2	0 2 4 3 8	__ __	1 2	1 2	0 2 4 3 8	__ __	1 2 8	0 2 4 3 8	__ __
02		__ __	1 2	0 2 4 3 8	__ __	1 2	1 2	0 2 4 3 8	__ __	1 2 8	0 2 4 3 8	__ __
03		__ __	1 2	0 2 4 3 8	__ __	1 2	1 2	0 2 4 3 8	__ __	1 2 8	0 2 4 3 8	__ __
04		__ __	1 2	0 2 4 3 8	__ __	1 2	1 2	0 2 4 3 8	__ __	1 2 8	0 2 4 3 8	__ __
05		__ __	1 2	0 2 4 3 8	__ __	1 2	1 2	0 2 4 3 8	__ __	1 2 8	0 2 4 3 8	__ __
06		__ __	1 2	0 2 4 3 8	__ __	1 2	1 2	0 2 4 3 8	__ __	1 2 8	0 2 4 3 8	__ __
07		__ __	1 2	0 2 4 3 8	__ __	1 2	1 2	0 2 4 3 8	__ __	1 2 8	0 2 4 3 8	__ __

	For household members age **5 and above**					For household members **age 5-24 years**					
ED1	**ED2**	**ED3**	**ED4A**	**ED4B**	**ED4C**	**ED5**	**ED6**	**ED7**	**ED8**		
Line number	*Name and age* *Copy from HL2 and HL6*	HAS (*name*) EVER ATTENDED SCHOOL OR PRE-SCHOOL? 1 Yes 2 No ⇘ Next Line	WHAT IS THE HIGHEST LEVEL OF SCHOOL (*name*) HAS ATTENDED? Preschool ..... 0⇨ED5 Secondary .....2 Vocational training....4 Higher.....3 Don't know.....8 *If completed non-formal equivalent education program (NFEEP), circle '2'.*	WHAT IS THE HIGHEST GRADE (*name*) COMPLETED AT THIS LEVEL? Grade: 98 DK *If less than 1 grade at this level, record '00'.* *If has attended primary school of NFEEP, record '21'; if basic or high school, record '22' and '23' respectively.*	HAS (*name*) COMPLETED SCHOOL HE OR SHE HAS ATTENDED? 1 Yes 2 No	DURING THE 2013/2014 SCHOOL YEAR, DID (*name*) ATTEND SCHOOL OR PRESCHOOL AT ANY TIME? 1 Yes 2 No ⇘ ED7	DURING 2013/2014 SCHOOL YEAR, WHICH LEVEL AND GRADE IS (*name*) ATTENDING? Level: Preschool.....0⇨ED7 Secondary .....2 Vocational training....4 Higher.....3 Grade: 98 DK Don't know.....8	DURING THE PREVIOUS SCHOOL YEAR, THAT IS 2012/2013, DID (*name*) ATTEND SCHOOL OR PRESCHOOL AT ANY TIME? 1 Yes 2 No ⇘ Next Line 8 DK ⇘ Next Line	DURING THE PREVIOUS SCHOOL YEAR, THAT IS 2012/2013, WHICH LEVEL AND GRADE DID (*name*) ATTEND? Level: Preschool.... 0⇘ Next Person Secondary..... 2 Vocational training.... 4 Higher ..... 3 Grade: 98 DK Don't know..... 8
08		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		
09		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		
10		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		
11		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		
12		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		
13		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		
14		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		
15		1 2	0 2 4 3 8		1 2	1 2	0 2 4 3 8	1 2 8	0 2 4 3 8		

HH.5

7. HOUSEHOLD CHARACTERISTICS			HC
HC1C	WHAT IS THE ETHNICITY OF THE HEAD OF YOUR HOUSEHOLD?	Khalkh ..... 11 Kazakh ..... 12 Durvud ..... 13 Buriad ..... 14 Bayad ..... 15 Dariganga ..... 16 Other (specify)_____ 96 Don't know 98	
HC1A	WHAT IS THE RELIGION OF THE HEAD OF THIS HOUSEHOLD?	No religion ..... 1 Religion Buddism ..... 2 Christianity ..... 3 Islam ..... 4 Shamanism ..... 5 Other (*specify*)_____ 6 Don't know 8	
HC1D	Type of dwelling *Record observation.* *If necessary, clarify.*	Ger ..... 1 Apartment, condominium ..... 2 Convenient single family house ..... 3 Single family house ..... 4 Public accommodation, dormitory ..... 5 Other (specify)_____ 6	1⇨ HC2A
HC1E	WHAT IS THE SIZE OF THE LIVING AREA OF YOUR DWELLING? *The size of kitchen, corridor/ hallway, and bathrooms are included.*	Sq.meter..... ___ ___ ___ Don't know 998	
HC1F	HOW MANY ROOMS DOES YOUR DWELLING HAVE? *Kitchen, corridor/ hallway, and bathrooms are not included in the number of rooms.*	Number of rooms ..... __ __	
HC2	HOW MANY ROOMS IN THIS HOUSEHOLD ARE USED FOR SLEEPING? *Those rooms, which are not called as bedrooms, but used for sleeping in a regular basis are included.*	Number of rooms ..... __ __	⇨ HC3
HC2A	HOW MANY WALLS DOES YOUR GER HAVE?	Number of ger walls ..... __ __	
HC2B	WHAT IS THE MAIN MATERIAL OF YOUR GER FLOOR?	Natural floor Earth/ Sand ..... 11 Dung/ manure ..... 12 Rudimentary floor Wood planks ..... 21 Finished floor Cement ..... 34 Other (specify) 96	11⇨ HC4A 12⇨ HC4A 21⇨ HC4A 34⇨ HC4A 96⇨ HC4A

HC3	*Main material of the dwelling floor.* *Record observation.* *If necessary, clarify.*	Rudimentary floor Wood planks ..... 21 Finished floor Parquet or polished wood ..... 31 Concrete, vinyl/ asphalt strips ..... 32 Ceramic tiles ..... 33 Cement ..... 34 Other (specify)_____ 96	
HC4	*Main material of the roof.* *Record observation.* *If necessary, clarify.*	Rudimentary roofing Wood planks ..... 23 Finished roofing Metal/ Tin ..... 31 Concrete/ Cement fibre ..... 33 Ceramic tiles ..... 34 Cement ..... 35 Sandwich panel ..... 37 Roof lead ..... 38 Other (specify)_____ 96	 23⇨ HC5 31⇨ HC5 33⇨ HC5 34⇨ HC5 35⇨ HC5 37⇨ HC5 38⇨ HC5 96⇨ HC5
HC4A	IS YOUR GER ROOF SINGLE LAYERED OR DOUBLE LAYERED?	Single ..... 41 Double 42	41⇨ HC5A 42⇨ HC5A
HC5	*Main material of the exterior walls.* *Record observation.* *If necessary, clarify.*	Rudimentary walls Mud with straw ..... 21 Stone with mud ..... 22 Uncovered adobe ..... 23 Plywood ..... 24 Cardboard ..... 25 Finished walls Cement ..... 31 Stone with lime/ cement ..... 32 Bricks ..... 33 Cement blocks ..... 34 Wood planks, shingles, logs ..... 36 Concrete/ cement board ..... 37 Sandwich panel ..... 38 Other (specify)_____ 96	 21⇨ HC5B 22⇨ HC5B 23⇨ HC5B 24⇨ HC5B 25⇨ HC5B 31⇨ HC5B 32⇨ HC5B 33⇨ HC5B 34⇨ HC5B 36⇨ HC5B 37⇨ HC5B 38⇨ HC5B 96⇨ HC5B
HC5A	IS YOUR GER WALL SINGLE LAYERED OR DOUBLE LAYERED?	Single ..... 41 Double 42	
HC5B	WHAT TYPE OF HEATING DOES YOUR DWELLING HAVE?	Central heating system ..... 1 Electric heater ..... 2 Boiler ..... 3 Fire stove ..... 4 Other (specify)_____ 6	1⇨ HC6 2⇨ HC6
HC5C	WHAT TYPE OF FUEL DOES YOUR HOUSEHOLD MAINLY USE FOR HEATING?	Coal (stone coal, lignite) ..... 06 Charcoal ..... 07 Wood ..... 08 Dung ..... 10 Sawdust ..... 11 Other (specify)_____ 96	
HC6	WHAT TYPE OF FUEL DOES YOUR HOUSEHOLD MAINLY USE FOR COOKING?	Electricity ..... 01 Liquefied Petroleum Gas (LPG) ..... 02 Coal (stone coal, lignite) ..... 06 Charcoal ..... 07 Wood ..... 08 Dung 10	01⇨HC8 02⇨HC8

		Sawdust ..... 11 No food cooked in household ..... 95 Other (specify)_____ 96	95⇨HC8
HC7	IS THE COOKING USUALLY DONE IN THE HOUSE, IN A SEPARATE BUILDING, OR OUTDOORS? *If 'In the house', probe*: IS IT DONE IN A SEPARATE ROOM USED AS A KITCHEN?	In the house In a separate room used as kitchen ..... 1 Elsewhere in the house ..... 2 In a separate building ..... 3 Outdoors ..... 4 Other (specify)_____ 6	
HC8	DOES YOUR HOUSEHOLD HAVE:	Yes No	
	[A] ELECTRICITY?	Electricity 1 2	
	[F] A RENEWABLE-ENERGY GENERATOR	A renewable-energy generator 1 2	
	[G] A COMPUTER?	Computer 1 2	
	[H] AN INTERNET CONNECTION?	Internet connection 1 2	
	[C] A TELEVISION?	Television 1 2	
	[B] A RADIO?	Radio 1 2	
	[D] A NON-MOBILE TELEPHONE?	Non-mobile telephone 1 2	
	[E] A REFRIGERATOR?	Refrigerator 1 2	
	[J] A WASHING MACHINE?	Washing machine 1 2	
	[K] A VACUUM CLEANER?	Vacuum cleaner 1 2	
	[L] A LIBRARY?	Library 1 2	
	[M] A MICROWAVE OVEN?	Microwave oven 1 2	
	[N] AN IRON?	Iron 1 2	
	[O] A MOTORCYCLE?	Motorcycle 1 2	
	[P] AN ANIMAL DRAWN CART?	Animal drawn cart 1 2	
	[Q] A CAR OR TRUCK?	Car or truck 1 2	
	[R] A TRACTOR?	Tractor 1 2	
HC9	DOES ANY MEMBER OF YOUR HOUSEHOLD OWN:	Yes No	
	[A] A WATCH?	Watch 1 2	
	[B] A MOBILE TELEPHONE?	Mobile telephone 1 2	
	[H] A CAMCORDER OR CAMERA?	Camcorder, camera 1 2	
	[C] A BICYCLE?	Bicycle 1 2	

HC10	DO YOU OR SOMEONE LIVING IN THIS HOUSEHOLD OWN THIS DWELLING? *If "No", then ask:* DO YOU RENT THIS DWELLING FROM SOMEONE NOT LIVING IN THIS HOUSEHOLD?	Own.....1 Owned by others Rent.....2 Free of rent.....3	
HC11	DOES ANY MEMBER OF THIS HOUSEHOLD OWN ANY LAND THAT CAN BE USED FOR AGRICULTURE?	Yes.....1 No 2	2⇨HC13
HC12	HOW MANY HECTARES OF AGRICULTURAL LAND DO MEMBERS OF THIS HOUSEHOLD OWN?	Hectares..... 1 ___ ___ ___ ___ Sq.meters..... 2 ___ ___ ___ ___ Don't know 99998	
HC13	DOES THIS HOUSEHOLD OWN ANY LIVESTOCK, HERDS, OTHER FARM ANIMALS, OR POULTRY?	Yes.....1 No 2	2⇨HC15
HC14	HOW MANY OF THE FOLLOWING ANIMALS DOES THIS HOUSEHOLD HAVE? [A] CATTLE, MILK COWS, OR BULLS? [B] HORSES, DONKEYS, OR MULES? [C] GOATS? [D] SHEEP? [H] CAMELS? [E] CHICKEN? [F] PIGS? *If none, record '0000'. If unknown, record '9998'.*	Cattle, milk cows, or bulls.. ___ ___ ___ ___ Horses, donkeys, or mules ___ ___ ___ ___ Goats ..... ___ ___ ___ ___ Sheep..... ___ ___ ___ ___ Camels..... ___ ___ ___ ___ Chicken ..... ___ ___ ___ ___ Pigs ..... ___ ___ ___ ___	
HC15	DOES ANY MEMBER OF THIS HOUSEHOLD HAVE A BANK ACCOUNT?	Yes.....1 No 2	

Appendix B

Questionnaire for Women Aged 15-49

Approved by the order 01/...of the Chairman of the National Statistical Office on 2013

Form SISS-2

SOCIAL INDICATOR SAMPLE SURVEY

QUESTIONNAIRE FOR INDIVIDUAL WOMAN AGED 15-49

1. WOMAN'S INFORMATION PANEL	**WM**
This questionnaire is to be administered to all woman age 15 through 49 see List of Household Members, column HL7). A separate questionnaire should be used for each eligible woman.	
WM1. Cluster number: __ __ __	**WM2.** Household number: __ __
WM3. Woman's name: Name_____	**WM4.** Woman's line number: __ __
WM5. Interviewer's name and number: Name_____ __ __	

Repeat greeting if not already read to this respondent:	*If greeting at the beginning of the household questionnaire has already been read to this person, then read the following:*
WE ARE FROM NATIONAL STATISTICAL OFFICE OF MONGOLIA AND CONDUCTING A SURVEY ABOUT THE SITUATION OF CHILDREN, WOMEN, FAMILIES AND HOUSEHOLDS. I WOULD LIKE TO TALK TO YOU ABOUT YOUR HEALTH AND WELL-BEING NEARLY 50 MINUTES. ACCORDING TO THE ARTICLE 5, PARAGRAPH 4 OF THE MONGOLIAN STATE LAW ON CONFIDENTIALITY OF AN INDIVIDUAL AND ARTICLE 22, PARAGRAPH 3 OF THE MONGOLIAN STATE LAW ON STATISTICS ALL THE INFORMATION WE OBTAN WILL REMAIN STRICTLY CONFIDENTIAL.	NOW I WOULD LIKE TO TALK TO YOU ABOUT YOUR HEALTH AND OTHER TOPICS. THIS INTERVIEW WILL TAKE ABOUT 50 MINUTES. AGAIN, ALL THE INFORMATION WE OBTAIN WILL REMAIN STRICTLY CONFIDENTIAL AND ANONYMOUS.

MAY I START NOW?

- ■ *Yes, permission is given ⇨ Go to WM10 to record the time and then begin the interview.*
- ■ *No, permission is not given ⇨ Circle '03' in WM7. Discuss this result with your supervisor.*

Date and result of woman's interview			
How many times you have visited	**MWM6.** Date (Year/ Month/ Day)	**WM7.** Result of the interview*	**Codes for the result of the interview***
1. First	2013/__ __/ __ __	__ __	Completed ..... 01 Not at home ..... 02 Refused ..... 03 Partly completed ..... 04 Incapacitated..... 05
2. Second	2013/__ __/ __ __	__ __	
3. Third	2013/__ __/ __ __	__ __	Other (*specify*) _____96

WM10	*Record the time.*	Hour and minutes..... __ __ : __ __	

2. WOMAN'S BACKGROUND			**WB**
WB1	IN WHAT MONTH AND YEAR WERE YOU BORN?	Date of birth Year ..... __ __ __ __ DK month ..... 9998 Month ..... __ __ DK year 98	
WB2	HOW OLD ARE YOU? *Probe:* HOW OLD WERE YOU AT YOUR LAST BIRTHDAY? *Compare and correct WB1 and/or WB2 if inconsistent*	Age (in completed years) ..... __ __	
WB3	HAVE YOU EVER ATTENDED SCHOOL?	Yes ..... 1 No 2	2⇨WB7
WB4	WHAT IS THE HIGHEST LEVEL OF SCHOOL YOU ATTENDED? *If completed non-formal equivalent education program (NFEEP), circle '2'.*	Secondary school ..... 2 Technical and vocational centre..... 4 University, institute/college..... 3	
WB5	WHAT IS THE HIGHEST GRADE YOU COMPLETED AT THAT LEVEL? *If less than 1 grade, enter "00"* *If has attended primary school of NFEEP, record '21', if basic or high school, record '22' and '23' resprctively.*	Grade..... __ __	
WB5A	HAVE YOU COMPLETED SCHOOL YOU HAVE ATTENDED?	Yes ..... 1 No 2	
WB6	*Check **WB4** and **WB5** to see if a woman is completed primary school.* ■ *No, completed 5 or higher grade in a secondary school or higher education (WB5>4) ⇨ Go to WB8* ■ *Yes, completed 1-4 grades in a secondary school (WB5<5) ⇨ Continue with WB7*		
WB7	NOW I WOULD LIKE YOU TO READ THIS SENTENCE TO ME. *Show sentence on the card to the respondent.* *If respondent cannot read whole sentence, probe:* CAN YOU READ PART OF THE SENTENCE TO ME?	Cannot read at all..... 1 Able to read only parts of sentence..... 2 Able to read whole sentence..... 3 No sentence in required language _____ 4 *(specify language)* Blind / visually impaired _____ 5	1⇨WB8 5⇨ WB8
WB7A	NOW I WOULD LIKE YOU TO WRITE SENTENCE WHICH I AM GOING TO READ TO YOU. *Show sentence written on the card to the respondent.* *If respondent cannot write whole sentence, probe:* CAN YOU WRITE PART OF THE SENTENCE?	Cannot write at all ..... 1 Able to write only some words of sentence. ..... 2 Able to write short sentence wholly 3	
WB8	ASIDE FROM YOUR OWN HOUSEWORK, HAVE YOU DONE ANY WORK IN THE LAST SEVEN DAYS?	Yes ..... 1 No 2	1⇨WB12

SISS.WM.2

WB9	AS YOU KNOW, SOME WOMEN TAKE UP JOBS FOR WHICH THEY ARE PAID IN CASH OR KIND. OTHERS SELL THINGS, HAVE A SMALL BUSINESS OR WORK ON THE FAMILY FARM OR IN THE FAMILY BUSINESS. IN THE LAST SEVEN DAYS, HAVE YOU DONE ANY OF THESE THINGS OR ANY OTHER WORK?	Yes ..... 1 No 2	1⇨WB12
WB10	ALTHOUGH YOU DID NOT WORK IN THE LAST SEVEN DAYS, DO YOU HAVE ANY JOB OR BUSINESS FROM WHICH YOU WERE ABSENT FOR LEAVE, ILLNESS, VACATION, MATERNITY LEAVE, OR ANY OTHER SUCH REASON?	Yes ..... 1 No 2	1⇨WB12
WB11	HAVE YOU DONE ANY WORK IN THE LAST 12 MONTHS?	Yes ..... 1 No 2	2⇨Next module
WB12	WHAT IS YOUR OCCUPATION, THAT IS, WHAT KIND OF WORK DO YOU MAINLY DO?	*(Specify)* _____ _____ _____ __ __	
WB13	DO YOU DO THIS WORK FOR A MEMBER OF YOUR FAMILY, FOR SOMEONE ELSE, OR ARE YOU SELF-EMPLOYED?	For family member ..... 1 For someone else ..... 2 Self-employed 3	
WB14	DO YOU USUALLY WORK THROUGHOUT THE YEAR, OR DO YOU WORK SEASONALLY, OR ONLY ONCE IN A WHILE?	Throughout the year ..... 1 Seasonally/part of the year ..... 2 Once in a while 3	

6. FERTILITY/BIRTH HISTORY			CM
CM1	NOW I WOULD LIKE TO ASK ABOUT ALL THE BIRTHS YOU HAVE HAD DURING YOUR LIFE. HAVE YOU EVER GIVEN BIRTH?	Yes ..... 1 No 2	2⇨CM8
CM4	DO YOU HAVE ANY SONS OR DAUGHTERS TO WHOM YOU HAVE GIVEN BIRTH WHO ARE NOW LIVING WITH YOU? I'M ASKING ABOUT YOUR CHILDREN TO WHOM YOU HAVE GIVEN BIRTH. CURRENTLY, THE CHILDREN MAY NOT LIVE WITH YOU, DIED OR NOT CHILDREN OF YOUR CURRENT HUSBAND/ PARTNER.	Yes ..... 1 No 2	2⇨CM6
CM5	HOW MANY SONS LIVE WITH YOU? HOW MANY DAUGHTERS LIVE WITH YOU? *If none, record '00'.*	Sons at home ..... __ __ Daughters at home ..... __ __	
CM6	DO YOU HAVE ANY SONS OR DAUGHTERS TO WHOM YOU HAVE GIVEN BIRTH WHO ARE ALIVE BUT DO NOT LIVE WITH YOU?	Yes ..... 1 No 2	2⇨CM8
CM7	HOW MANY SONS ARE ALIVE BUT DO NOT LIVE WITH YOU? HOW MANY DAUGHTERS ARE ALIVE BUT DO NOT LIVE WITH YOU? *If none, record '00'.*	Sons elsewhere ..... __ __ Daughters elsewhere ..... __ __	
CM8	HAVE YOU EVER GIVEN BIRTH TO A BOY OR GIRL WHO WAS BORN ALIVE BUT LATER DIED? *If "No" probe by asking:* I MEAN, TO A CHILD WHO EVER BREATHED OR CRIED OR SHOWED OTHER SIGNS OF LIFE – EVEN IF HE OR SHE LIVED ONLY A FEW MINUTES OR HOURS?	Yes ..... 1 No 2	2⇨CM10
CM9	HOW MANY BOYS HAVE DIED? HOW MANY GIRLS HAVE DIED? *If none, record '00'.*	Boys dead ..... __ __ Girls dead ..... __ __	
CM10	*Sum answers to CM5, CM7, and CM9.*	Sum ..... __ __	

CM11	JUST TO MAKE SURE THAT I HAVE THIS RIGHT, YOU HAVE HAD IN TOTAL (*total number in CM10*) LIVE BIRTHS/ NO BIRTHS DURING YOUR LIFE. IS THIS CORRECT? ■ *Yes. Check below:* ■ *No live births ⇨ Go to ABORTION Module* ■ *One or more live births ⇨ Continue with the BIRTH HISTORY module.* ■ *No. ⇨ Check responses to CM1-CM10 and make corrections as necessary before proceeding to the BIRTH HISTORY Module*