Where Do You Dwell? Neighborhood as a Determinant of School Attendance 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. This study examined school attendance rates across housing types in Ulaanbaatar, Mongolia. Based on literature establishing associations between neighbourhood deprivation and adverse health and educational outcomes, and on emerging scholarship of ger districts in Ulaanbaatar, the study hypothesized residence in ger districts (gers and family houses) would be associated with lower rates of school attendance. A chi-square test of homogeneity was conducted on dataset made available by UNICEF to examine group differences in school attendance within a sample of 2,827 young people between the ages of 6-18, across three housing types (gers, houses, apartments). Results indicate residence in ger districts is associated with lower rates of school attendance compared to residence in apartment districts. Policy implications include improvements in physical environment and public services in ger districts.

Keywords: housing, neighbourhood, school attendance, *ger district*

1. 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). 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). Among these, education is one of the strongest predictors of health (Freudenberg &Ruglis, 2007). 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 (Deaton, 2002; Cutler & Lleras-Muney, 2006).

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).

Despite the well-documented effects of neighborhoods and housing on education-related outcomes in the United States and in the United Kingdom, no study to date has examined differences across neighborhoods and/or housing types in educational outcomes in Ulaanbaatar – the capital of Mongolia, and the most densely populated region of the country. This lack of research on educational outcomes across neighborhoods in Ulaanbaatar contrasts to more abundantly available health research on Ulaanbaatar neighborhoods (Jadambaa, Spickett, Badrakh, & Norman,2015).The present study sought 1) to explore housing type as an indicator of neighborhood socio-economic status (SES) in Ulaanbaatar, and 2) to examine school attendance among children and youth in Ulaanbaatar across the three most common housing types in the city, which also make up two distinct types of neighborhoods – *ger* neighborhoods and apartment neighborhoods, which will be referred to as *ger districts* and apartment districts in the remainder of this manuscript.

2.Literature Review

2.1. Relationship between Education and Health

There is a strong association between education and health, such that health status improves in tandem with education level (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 (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).

2.2. 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).

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). Neighborhood affluence has also an impact on children's externalizing problem behaviors, levels of depressive symptomatology, and substance use (Buu et al., 2015). 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).

In terms of health outcomes, studies have shown associations between neighborhood deprivation and infant and child health (Krieger et al., 2013), health-related behaviours (Jim et al., 2003), perceived general and mental health (Ross & Miroswky, 2001), cardiovascular disease (Barber et al., 2016), violence and murder (Leylas& Dundas, 2010), and all-cause mortality (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).

2.3. Ulaanbaatar: Housing Types and Neighborhoods

It should be noted that defining neighborhood dimensions is not a simple task and poses a significant challenge to the research community (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. Once neighborhoods are identified, an important distinction in the literature is made between structural and social organizational characteristics of neighborhoods. Structural characteristics include economic and demographic information such as extent of neighborhood poverty, female family-headship, public assistance receipt, male joblessness, 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.

There are two distinct types of residential areas in Ulaanbaatar, apartment districts and *ger districts,* which typically differ in terms of infrastructure, population density, and quality and quantity of social services (Lindskog, 2014; del Rosario, 2005). *Gers* are circular tent-like dwellings traditionally used by Mongolian herders who move with the seasons seeking new grazing locations for their herds. However, today *gers* can be seen in *ger districts* in the capital of Mongolia – Ulaanbaatar.

A substantial proportion of households living in *ger districts* are former pastoralist herders who moved to the periphery of the capital due to unsustainable development policies in Mongolia catalyzed by the transition from socialist to capitalist governance in 1990. Specifically, the transition led to a serious governmental neglect of rural areas in terms of social service provision (Mayer, 2016; Lindskog, 2014). An integral part of the transition process was the dismantling of the state farms and pastoral herder collectives. As a result, quality and quantity of health facilities and schools in rural areas declined and herders became more vulnerable to winter weather calamities (which can result in loss of some or all livestock for herders) (Lindskog, 2014; Steiner-Khamsi & Stolpe, 2016). Combined together, disinvestment in rural areas and lack of safety networks for pastoralist herders, led to high in-migration to Ulaanbaatar. Subsequently, the majority of households migrating to Ulaanbaatar tend to settle on the outskirts of Ulaanbaatar in *ger districts* (Mayer, 2016; Lindskog, 2014).

Ger districts in Ulaanbaatar combine both houses **and** *gers*, that is, not all households in *ger districts* 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, *ger district* residents lack access to infrastructure and to services compared to apartment district residents regardless of the type of dwelling. Specifically, the majority of *gers* and houses in *ger districts* have access to electricity but not access to a supply of hot water (Byambadorj et al., 2011). Furthermore, *ger district* residents, both living in houses and *gers*, purchase their drinking water from distribution wells/kiosks where the water is transported to by trucks or have water piped to them continuously. Moreover, ninety-seven per cent of households, living both in *gers* and houses, have outside latrines and no bathroom (UNDP, 2004). Despite having access to electricity, there is no heating system in *ger districts* - the majority of households uses wood and coal for cooking and heating, an activity that substantially contributes to urban ambient air pollution (UNICEF, 2016). Emerging scholarship on *ger districts* in contemporary Mongolia shows that residence in *ger districts* entails exposure to environmental risks (unsafe drinking water and polluted air and soil), hindered access to primary health care and social services due to poor infrastructure or overcrowding, and social isolation all leading to poor health outcomes (Jadambaa et al,2015; Terbish & Rawthorne, 2016; Batbaatar et al., 2005; Lindskog, 2014).

Although a housing type may just be a proxy for affluence in the context of Ulaanbaatar, it is important to recognize that more than half of Ulaanbaatar's population lives in *ger districts* and there are significant variations in income level within *ger districts* as well. As such, it is important to compare educational outcomes across housing types in Ulaanbaatar which would not only allow for a comparison across the three most common housing types in Ulaanbaatar: apartments, *gers*, and single family houses, but also a comparison of types of neighborhoods: apartment districts and *gerdistricts*.

2.4. Educational Outcomes in Ulaanbaatar

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. As such, the importance educational attainment cannot be understated. For example, high school completion acts as an intergenerational transfer mechanism of poverty in Mongolia, such that school dropout results in twice the probability of working poverty (Pastore, 2016).Furthermore, the rates of return to education are higher in urban than in rural areas thus highlighting the importance of studying school attendance levels within Ulaanbaatar - the largest urban center in Mongolia.

Educational enrollment is one of the indicators of school completion and differences exist among different groups of Mongolia's population on this indicator (NSOM, 2015). The proportion of children not enrolled/not attending school in rural areas are higher than in urban areas, and enrollment rates are higher for more wealthy families at each educational level nationwide. The sparse but existing research on educational opportunities and outcomes in Ulaanbaatar suggest that children who live in *ger districts* may experience inequitable educational opportunities compared to their apartment-dwelling counterparts. Children residing in *ger districts* tend to live further away from schools which either means not being able to go to school or having to overcome issues with transportation and security (Batbaatar et al., 2005). Furthermore, registration and documentation issues for recent migrants, discrimination of school personnel and peers against children from low SES backgrounds, and financial inability of students' families to cover the costs associated with going to school- commonly associated with living in *ger districts* - all contributed to dropping out of school (del Rosario, 2005; Batbaatar et al., 2005). Not surprisingly, children of residents who recently migrated into Ulaanbaatar, such as children of former herders who lived in *ger districts*, were more likely to not be in school at all or to drop out of school. Lastly, schools in peripheral areas often operated beyond their capacity to accommodate the ever-increasing population within *ger districts*.

Although increase in enrolment rates was a major accomplishment since the 1990s, quality of education remains an issue (Engel, Prizzon, & Amgaabazar, 2014). The underachievement of public school students is evident from the results of final government exams - 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). 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).

Ulaanbaatar is not a homogeneous urban group, as relative social, educational and economic opportunities vary by neighborhood/dwelling type in and around the capital city. Therefore, as education is organized at the neighborhood level, it is important to explore the role of neighborhoods as the determinant of school attendance 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. Based on literature examining neighborhood effects on education related variables and on emerging scholarship on *ger districts*, I argue that residence in *ger districts* in Ulaanbaatar is associated with unfavorable educational outcomes. Specifically, *ger districts* are likely to have higher non-attendance rates than apartment districts.

3. Method

3.1. 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 includes detailed information on a range of topics including health, education, social protection, well-being, and rights of children and women. The survey is conducted with an objective of producing comparable data across time, in relation to other countries, and goals outlined in national and international documents. As such, it is an important source of information for policymakers, planners, program managers, and international organizations in Mongolia.

A multi-stage, stratified cluster sampling approach was used to select the survey sample(NSOM, 2015).Ulaanbaatar was one of the main sampling strata, and the sample was selected in two stages. Ulaanbaatar is divided into nine districts which are further subdivided into *duuregs* and *khesegs*. At the first stage the primary sampling units (PSUs) were *khesegs* in Ulaanbaatar. The PSUs were selected systematically with probability proportional to size. After a household listing was carried out in the sample PSUs, a systematic sample of 25 households was selected within each sample PSU. In total14,805 households were successfully interviewed at the national level. The analysis in the current study will be limited to 4,811 households sampled from Ulaanbaatar region. Out of the nine districts in Ulaanbaatar three are suburban (Nalaikh, Baganuur, and Bagakhangai) and were excluded from the analysis in this study.

The analysis in this study is based on data from the Household Questionnaire in the MICS.The factors examined in this study were wealth index quintile of the household, educational attainment of the household head, school attendance of children and young people of ages between six and 18, and type of dwelling of the household.
Wealth index quintile of the householdwas a variable in the dataset with five categories: poorest, second, middle, fourth, and richest (NSOM, 2015). Educational attainment of household head was a variable with the following categories: none, primary, basic (lower secondary), upper secondary, vocational, college/university, cannot be determined, or missing. School attendance was a dichotomous variable, which was a record of parents' answer to the question: "During the 2013/2014 school year, did (name) attend school or pre-school at any time?"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.

3.2. Participants

A total of 2,827 children and youth of ages between six and 18 and were included in the analysis of the current study. The sample had an equal distribution of sexes and of children at each age category.

3.3. Data Analysis Procedure

There were two SPSS data files associated with the Household Questionnaire available through UNICEF and NSOM, these files included: (1) an individual-level dataset with information on school attendance for household members aged 6 to 18, and (2) a household-level dataset with information on household dwelling type, wealth level, and household head's educational attainment. In order to examine the differences in school attendance across housing types, the household-level dataset with the dwelling type information was merged with the individual-level dataset based on the cluster and the household numbers.

4. Results

4.1. Housing Type as a Measure of Neighborhood Socio-Economic Status

Prior to looking at differences in school attendance across housing types, descriptive analyses pertaining to housing types in Ulaanbaatar were conducted. It was found that out of the 4,811 households included in the analysis, 39% lived in apartments or in condominiums, 35% lived in single family houses, and 23% of households lived in *gers*. Share of households living in the other types of housing, which were convenient single family houses and public accommodation/dormitories, was under 4% and were not included in further analysis.

In order to get a clearer picture of the socio-economic condition of housing types, crosstab analyses were conducted between housing types and wealth levels, and housing types and educational attainment of household heads. Although information about housing was used to compute the wealth indices in the dataset (NSOM, 2015), which in turn may have resulted in some overlap between the measure of wealth index and housing type, there is likely to be some variation in terms of wealth within each housing type. As seen in Table 1, wealth distribution varied by housing type such that the majority of *ger* dwellers (65%) fell into second to the poorest wealth quintile, the majority of dwellers of single family houses (64%) fell into second to the richest wealth quintile, and the majority of apartment/condominium dwellers (90%) were in the richest wealth quintile.

Table 1. Wealth Index Quintiles Frequency Distribution by Dwelling Type

Wealth index	Type of dwelling		
	*Ger*dwelling	Single family house	Apartment/ Condominium
	Ger district		
Poorest	3%	0%	0%
Second	65%	1%	0%
Middle	31%	34%	0.1%
Fourth	1%	64%	10%
Richest	0%	1%	90%

Similar pattern was evident from the analyses of the household heads' educational attainment across the three housing types (Table 2). Half of household heads who lived in *gers* had attained lower secondary and upper secondary educational qualifications.

In comparison, 50% of household heads who lived in single family houses and 76% of household heads in apartments/condominiums had vocational and college/university qualifications.

Table 2. Educational Attainment of Household Head by Dwelling Type

Education level of household head	Type of dwelling		
	*Ger*dwelling	Single family house	Apartment/Condominium
	Ger district		
None	6%	2%	1%
Primary	11%	7%	2%
Basic (lower secondary)	22%	16%	3%
Upper secondary	28%	25%	18%
Vocational	15%	20%	8%
College/university	18%	30%	68%

4.2. Differences in School Attendance across Housing Types

In order to test differences in school attendance rates among household members aged 6-18 years across the three types of housing, a chi-square test of homogeneity was conducted. It was revealed that 4.4% of youth between the ages of 6 and 18 living in *gers* (*n*=33) did not attend school in the 2013-2014 academic year compared to 4.1% of those living in single family housing (*n*=40) and 1.3% of youth living in apartment/condominium (*n*=14). These differences in proportions were found to be statistically significant, $\chi^2(2) = 18.92$, $p<.001$. 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, $p>.05$.

Given the effect of age on school attendance (NSOM, 2015; Boyle, Brock, Mace, & Sibbons, 2002), a chi-square test of homogeneity was conducted for attendance rates exclusively for 14 to 18-year-olds across housing types. It was revealed that 11% 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 10% of those living in single family housing (*n*=46) and 3% of youth living in apartment/condominium (*n*=14), a statistically significant difference in proportions, $\chi^2(2) = 19.33$, $p<.001$. 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, $p>.05$.

5. Discussion

The aim of the current study was to explore the socio-economic conditions of the three common types of housing in Ulaanbaatar, and to examine differences in school attendance across these housing types in Ulaanbaatar. Comparing the socio-economic conditions and school attendance across the three housing types – *gers*, single family houses, and apartments – not only allows for direct comparison of housing types but also of two types of neighborhoods in Ulaanbaatar, namely, *ger districts* and apartment districts. 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 through their interaction with educational outcomes.

The findings outlined in this study contribute to the sparse literature on *gerdistricts* in Ulaanbaatar by comparing *gerdistrict* residents' educational outcomes to those living in apartment/condominium districts. High in-migration to Ulaanbaatar has put pressure on both health and educational institutions in Ulaanbaatar (Lindskog, 2014; Mayer, 2016), and as such may be affecting health and educational opportunities and outcomes of the residents, particularly those living in *ger districts*.

5.1. 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 *gerdistricts* 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 housing 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).

A similar pattern emerged from the analysis of educational attainment of the household heads across the three housing types. Heads of apartment households were the most educated, followed by those of single family households and then *ger* households. This is consistent with the research that shows that majority of *ger district* residents are former pastoralists (Mayer, 2014) and who are likely to have lower educational attainment than those who were born in Ulaanbaatar. Given the strong association between educational attainment of parents and the probability of school dropout of their children (Pastore, 2016) and wealth and school enrolment (NSOM, 2015), one would expect that *ger* households would have the highest non-attendance rates followed by single family houses and then apartment households.

Although single family house dwelling households were both wealthier and the heads of these households more educated than their *ger* dwelling counterparts, they did not differ in terms of proportion of children not attending school. For example, the proportions of children and youth of ages between 6 and 18 who did not attend school in the year of the interview living in *gers*(4.4%)and single family houses (4.1%) did not significantly differ from each other, and were higher than the proportion among the apartment (1.3%) dwellers. In other words, regardless of whether the household lived in a *ger* or a single family house, non-enrolment rates were higher compared to apartment households. Furthermore, the disparity in school non-attendance rates increased with age (*ger* = 11%, single family house = 10%, apartment = 3%).

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. *Ger* and single family house dwelling households share similar experiences in terms of the surrounding neighborhood physical environment and health and educational facilities as evidenced in the review of *gerdistricts* in Ulaanbaatar (Batbaatar et al., 2005; del Rosario, 2005; Lindskog, 2014; Jadambaa et al., 2015).

5.2. Limitations

Although the association between housing type and school attendance rate was significant, this is merely an association. The major limitation of the current study is that it cannot be concluded that type of housing affects educational outcomes above and beyond individual characteristics, such as family income, economic hardship, and home ownership, which were not included in the analysis (Ross & Mirowsky, 2008). 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. Additionally, school attendance rate was the only education-related variable that was examined in the study. Future research investigating a variety of education-related variables and replicating these findings is needed in order to ascertain neighborhood effects on educational outcomes.

5.3. Implications

Notwithstanding its' limitations, this study contributes to knowledge about the distribution of adverse educational outcomes across different housing types and hence neighborhoods in Ulaanbaatar. Specifically, children and youth of ages between 6 and 18 living in *ger* neighborhoods may be at heightened risk of poor educational outcomes. There are several policy implications with regards to improving educational outcomes in *gerdistricts*, which are improved economic condition of residents, infrastructure, physical environment, institutional resources, and social environment (drawn from Stafford & McCarthy, 2006; Leventhal & Brooks-Gunn, 2000). *Gerdistrict* 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).

Institutional resources, such as childcare, schools, and medical facilities, need to be not only available to *gerdistrict* 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. 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.

5.4. Conclusions and Future Directions

The present study makes a significant contribution to the existing literature on *gerdistricts* in Ulaanbaatar. Specifically, in making use of a nationally representative dataset that contains information both on housing type and education indicators, the study has found significant variations in educational 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 *gerdistricts* may be at heightened risk of poor educational as well as future health outcomes. Furthermore, within *gerdistricts* 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 *gerdistricts* are likely to be unhealthy not only now (Jadambaa et al., 2015), but also in future, by way of the influence of educational attainment (or lack thereof). Given the fact that more than 60% of Ulaanbaatar's population reside in *gerdistricts* (NSOM, 2013)this is of serious concern for the public health of this region.

Furthermore, it is important not to study *gerdistricts* solely through a deficit-lens - attention should be paid to the cultural richness and community capacities of *gerdistricts* which may act as protective factors (Terbish & Rawsthorne, 2016). Moreover, the nine administrative districts (*duuregs*) in Ulaanbaatar are further sub-divided into 152 *khoroos* which are in turn 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). Future multi-level analyses based on these subdivisions are needed to firmly establish neighborhood effects on educational outcomes in Ulaanbaatar.

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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