Main Report of "Household Income and Expenditure Survey/Living Standards Measurement Survey", 2002-2003

National Statistical Office
World Bank
United Nations Development Programme

This report is also available in Mongolian. The opinions expressed here are only those of the authors and do not necessarily reflect those of the institutions involved.

For comments, please contact the National Statistical Office at:

Government Building III
Baga Toiruu 44, Sukhbaatar District,
Ulaanbaatar, Mongolia

E-mail: nso@magicnet.mn
Fax: 976-1-324518

Published by the National Statistical Office
Ulaanbaatar, Mongolia, 2004

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FOREWORD

Since the onset of the transition to a market economy of Mongolia our country the need to study changes in people's living standards in relation to household members' demographic situation, their education, health, employment and household engagement in private enterprises has become extremely important. With that purpose and with the support of the World Bank and the United Nations Development Programme, the National Statistical Office of Mongolia conducted the Household Income and Expenditure Survey with Living Standards Measurement Survey-like features between 2002 and 2003. Prior to this survey, the first Living Standards Measurement Survey was carried out in 1995 with technical and financial support from the World Bank and the second Living Standards Measurement Survey followed in 1998 with the support from United Nations Development Programme.

The integrated Household Income and Expenditure Survey with Living Standards Measurement Survey used new sample design and methodology in accordance with international methodologies, and it combined two different types of surveys, namely, the Household Income and Expenditure Survey and the Living Standards Measurement Survey. While doing the survey, we used the principle of using a combination of data. For example, the Household Income and Expenditure Survey collected data based on monthly questionnaires on housing services, housing, electricity, fuel and similar costs, as well as daily food purchase lists. The Living Standards Measurement Survey collected data on other non-food expenditures through quarterly questionnaires. A total of 11,232 households were surveyed under the Household Income and Expenditure Survey, and a sub-sample of 3,308 was surveyed under the Living Standards Measurement Survey. The integrated processing of data from two different surveys collected at various times at the same survey units provided an opportunity to ensure better linkage between income and expenditures. Moreover, through this experience we have made a contribution to the international practice on these two surveys. The new sample design of the survey was made in such a way as to have national average, by 4 main settlements such as the capital city, aimag centers, soum centers, as well as by urban and rural areas. This enabled to report and analyse the information in accordance with the regions determined by the Government of Mongolia.

This survey report has main results on key poverty indicators, used internationally, as they relate to various social sectors. Its annexes contain information regarding the consumption structure, poverty lines along with the methodology used, as well as some statistical indicators.

The results of this survey provide the picture of the current situation of poverty in Mongolia in relation to social and economic indicators and will contribute toward implementation and progress on National Millennium Development Goals articulated in the National Millennium Development Report and monitoring of the Economic Growth Support and Poverty Reduction Strategy, as well as toward developing and designing future policies and actions. We are also pleased to note that the survey enriched the

national database on poverty and contributed in improving the professional capacity of experts and professionals of the National Statistical Office of Mongolia.

We hope that the results of the survey will provide policy makers and decision makers with realistic information about poverty and will become a resource for experts and researchers who are interested in studying poverty as well as social and economic issues of Mongolia.

P. BYAMBATSEREN	PRATIBHA MEHTA	SAHA MEYANATHAN
THE CHAIRMAN, NATIONAL STATISTICAL OFFICE OF MONGOLIA	RESIDENT REPRESENTATIVE UNDP, MONGOLIA	RESIDENT REPRESENTATIVE WORLD BANK OFFICE MONGOLIA

AKNOWLEDGMENTS

The integrated Household Income and Expenditure Survey and Living Standards Measurement Survey is one of the biggest national surveys carried out in accordance with an international methodology. It is the result of the 3 years cooperation of the staff at all level of World Bank and United Nations Development Programme, the two organizations that gave technical and financial support in undertaking this survey. The staff and experts of National Statistical Office and its local offices participated in conducting the survey. Also, I am pleased to acknowledge the contribution of citizens from more than 11 thousand households of our country who participated in the survey.

I would like to express my gratitude and special thanks to Ms. B.Tserenkhand, Director of the Department of Population and Social Statistics of the National Statistical Office, Ms.D.Oyunchimeg, the Deputy Director of the Population and Social Statistics Department, Ms.Yu. Tuul, the Senior Statistician of the Population and Social Statistics Department, Ms.Ts. Amartuvshin, Ms.L. Ganzaya and Ms. B.Enerelt, Statisticians of the Population and Social Statistics Department for the successful organization and conduct of the survey, and Mr. J. Munoz and Ms. V. Evans the World Bank Experts for their cooperation in developing the survey sample design, information processing program and questionnaire. Also, my deep acknowledgement goes to Mr.L.Carroro and Mr.M.Cumpa, World Bank Experts for their cooperation with the members of the working group in conducting the survey in accordance with an international methodology and technology in writing this report.

Finally, I would like to thank all Members of Management Board of the survey and Members of Methodology Working Group and Chairman's Board of NSO for their advice and comments in survey questionnaire and their comments on draft report. I would also like to thank the Aimag, Soum and Bag authorities, and officers of Ulaanbaatar and local offices of National Statictical Office of Mongolia and all the other individuals for conducting the survey and then support all through the process.

P. BYAMBATSEREN

THE CHAIRMAN, NATIONAL STATISTICAL OFFICE OF MONGOLIA

LIST OF ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
Conf.Interval	Confidence interval
DPSDD	Data Processing and Software Development Department
GDP	Gross Domestic Product
HH	Household
Hhsize	Household size
HIES	Household Income and Expenditure Survey
HIES-LSMS	Household Income and Expenditure Survey with Living Standards Measurement Survey
IMF	International Monetary Fund
IUD	Intrauterine (contraceptive) device
LSMS	Living Standards Measurement Survey
MEBSD	Macroeconomic and Business Statistics Department
MECS	Ministry of Education, Culture and Science
MF	Ministry of Finance
MH	Ministry of Health
MSWL	Ministry of Social Welfare and Labour
NGO	Non-government organization
NSO	National Statistical Office
Obs	Observation
PHC	Population and Housing Census
PL	Poverty line
PSSD	Population and Social Statistics Department
PSU	Primary sampling unit
Q	Quintile
STD	Sexually transmitted disease
Std.Err	Standard error
UN	United Nations
UNDP	United Nations Development Programme

.

EXECUTIVE SUMMARY

This report presents the poverty analysis conducted using the 2002-2003 HIES-LSMS. Two main objectives of this analysis are: 1) the calculation of new poverty estimates for Mongolia, disaggregated at the regional level (urban/rural areas and geographical zones); 2) the production of a poverty profile that describes the main characteristics of the poor in contrast with the non-poor.

The economic background

In the years preceding to the HIES-LSMS survey, economic growth was very modest, a mere 2% in terms of GDP per capita at constant prices between 1999 and 2002. However, the overall growth hides a very diverse sectoral performance. Agriculture experienced a negative growth as a consequence of extraordinary adverse weather conditions that were responsible for a dramatic loss of livestock. On the other hand, both industry and services performed very well, growing respectively by 24 and 44% in real terms. 1999 to 2002 the share of agriculture to GDP almost halved going from 36.5% to 20.1%. Such transformation in the GDP composition was both the result of a drastic absolute decline in agriculture and an opposite positive absolute increase of industry and services.

Poverty measures

Poverty is a widespread phenomenon in Mongolia given that, although using a lower bound poverty line, 36.1% of the population is found to be poor. Other poverty indicators confirm that also depth of poverty and inequality among the poor are of substantial magnitude: the poverty gap being 11.0% and the severity of poverty 4.7%. Moreover, there is evidence suggesting that poverty increased in the last five years, but the advance is limited if considering the extreme losses suffered in the agriculture sector.

Inequality

Inequality as measured by the Gini coefficient is 0.33 and there is robust evidence showing that inequality is higher in urban than in rural areas of the country. The richest 20% of the population consumes almost 5.5 times the amount consumed by the poorest 20% of the population.

The main characteristics of the poor

Poverty in urban domains is significantly lower than in rural areas, 30% and 43% respectively. Ulaanbaatar displays the lowest level of poverty in the country. Five out of nine poor live in rural regions, and the countryside comprises a third of the poor. Poverty decreases as one moves eastward, for instance in the West half of its residents are poor, whereas in the East this figure stands at around one third.

Mongolia presents clear seasonality patterns along the year. The incidence of poverty in the second and fourth quarters is five percentage points higher than in the rest of the year. This seems to be associated mainly with seasonal livestock activities and weather conditions.

Some characteristics of the household head are correlated with the level of poverty of the household. The higher the level of education of the household head, the lower the poverty experienced: barely less than half of the population living with a head with less than complete secondary is poor, compared to one ninth if the head has at least a bachelor degree. Being employed in agriculture increases the chances of being poor, while these are the least if working in services. Public and state companies seem associated with better living standards. Migrants show lower levels of poverty at the national level than non-migrants, although differences are smaller when looking in urban or rural areas.

Assets allow households to hedge against economic insecurity. The main asset owned by the population in Mongolia is livestock. The livestock held by the poor is on average less than half of that of the non-poor. Households rearing livestock display lower levels of poverty only in rural areas. But regardless of the region, the more livestock the household holds, the less poverty it experiences. The incidence of poverty among households with financial assets is significantly lower than among households without savings or stocks.

Housing appears to be correlated with poverty only in urban areas, population living in apartments are the least poor, while the opposite occurs in gers. In rural areas, dwellers in houses display a higher incidence of poverty than those living in gers. Access to infrastructure services displays a similar pattern, whereas in urban areas having access to improved water sources, improved sanitation facilities or electricity is associated with less poverty, no clear trend emerges in rural areas. The non-poor and especially urban dwellers enjoy more access to any of these three services.

Poverty and the education sector

The educational attainment of the adult population is very high. A third of the population has either tertiary or vocational studies. The poor display lower attainments than the non-poor, more than half of the poor reach only the 8th grade of secondary compared to one third of the non-poor. Public spending in primary is progressive, largely neutral in secondary and regressive in tertiary education. Enrollment rates for the poor and non-poor are similar in primary, but in secondary the non-poor display higher rates. Among current students in public institutions, the non-poor spend on average sixty percent more than the poor in both primary and secondary.

Poverty and the health sector

Morbidity rates are very low, only 6% of the population reported any health complaint in the month previous to the survey. The non-poor report more health complaints than the poor, and the differences grow larger the older the person gets. When they have a health problem, the non-poor are also more likely to seek treatment. Urban dwellers and the non-poor are more likely to visit private facilities, but both poor and non-poor have similar chances of being attended by a doctor. The non-poor spend more than three times as much as the poor, and this pattern is even more evident across quintiles, the richest 20% of the population spend seven times the amount of the poorest 20%. Knowledge of sexually transmitted diseases is similar among poor and non-poor, although the latter are better informed on how to protect themselves. Regarding reproductive health issues, poor women are slightly more likely than non-poor women to currently use contraceptive

methods, or if pregnant, to seek and obtain antenatal care. Lastly, poor women are less likely to have abortions, but if they do, a major reason is the lack of financial means.

Poverty and the labor market

The labor force participation rate stands at 65%. Urban areas have significantly lower participation rates than rural regions, less than three fifths compared to three quarters respectively. The poor display lower rates of participation in the labor market than the non-poor. The main sectors of employment are very different in urban and rural areas. Livestock activities dominate in rural regions, more than seven out of ten workers engage in them, whereas in the capital and aimag centers, services account for almost three quarters of the jobs. The likelihood of being a herder or a farmer is higher for the poor, whereas the non-poor are more likely to be managers, professionals and technicians. Finally, unemployment is similar in urban and rural areas but the poor have a rate of unemployment more than double that of the non-poor.

Poverty and safety nets

The extent of safety networks is impressive: four out of five households either give or receive some sort of transfer. Seventy percent of households are recipients, while every other family is a donor. Both public and private transfers received by the households have a similar coverage but the former makes up for almost three quarters of the total amount transferred. Nationwide, similar levels of poverty are observed among those living in households getting transfers and those in households that do not get them. But the net amount received by the household does matter, the higher the transfer received, the less poverty experienced.

INTRODUCTION

In July 2003 the Government of Mongolia completed the Economic Growth and Poverty Reduction Strategy Paper in which the Government gave high priority to the fight against poverty. As part of that commitment this paper is a study that intends to monitor poverty and understand its main causes in order to provide policy-makers with useful information to improve pro-poor policies.

The main contributions of this paper are:

1) new poverty estimates based on the latest available household survey, the 2002-2003 HIES-LSMS;
2) the implementation of appropriate, and internationally accepted, methodologies in the calculation of poverty and its analysis (these methodologies may constitute a reference for the analysis of future surveys);
3) a 'poverty profile' that describes the main characteristics of poverty.

The 2002-2003 HIES-LSMS was implemented using an improved methodology in the selection of the sample using the information of the recent Census, instead of administrative data. The sample selection methodology followed recognized international standards and its results are deemed to be properly representative of the country situation. However, its main results are not directly comparable with those of previous LSMS, namely 1995 and 1998, nonetheless the paper also tries to indirectly assess poverty trends in the last five years.

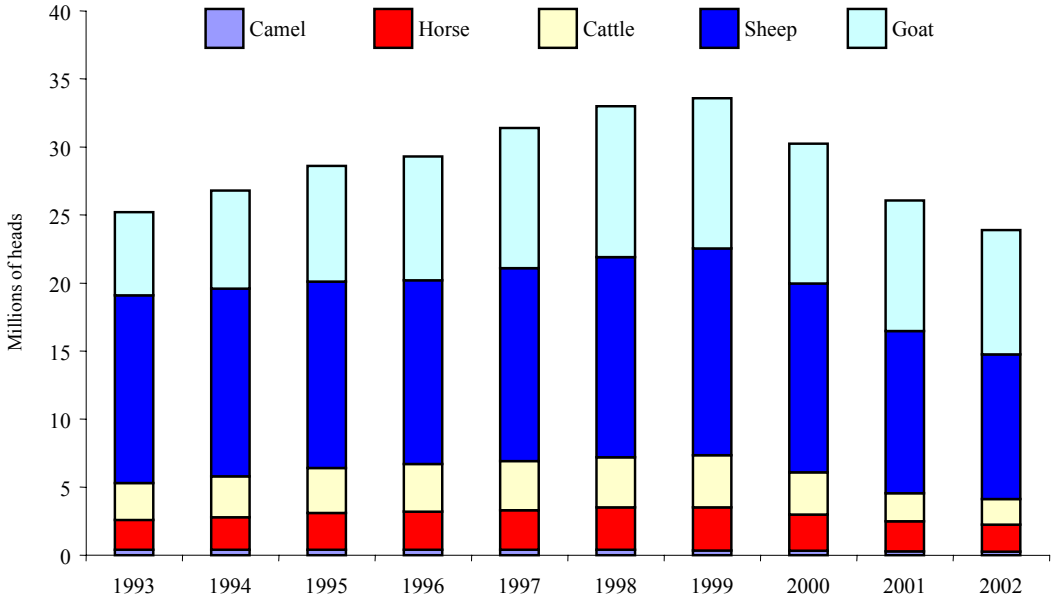
The first section of the paper provides information on the Mongolian economic background, and presents the basic poverty measures that are linked to the economic performance to offer an indication of what happened to poverty and inequality in recent years. A second section goes in much more detail in generating and describing the poverty profile, in particular looking at the geographical distribution of poverty, poverty and its correlation with household demographic characteristics, characteristics of the household head, employment, and assets. A final section looks at poverty and social sectors and investigates various aspects of education, health and safety nets. The paper contains also a number of useful, but more technical appendixes with information about the HIES-LSMS survey (sample design and data quality) (Appendix A), on the methodology used to construct the basic welfare indicator, and set the poverty line (Appendix B), some sensitivity analysis (Appendix C), and additional statistical information (Appendix D and E).

1. MACROECONOMIC PERFORMANCE AND POVERTY TRENDS

1.1. Economic background

In the last five years Mongolia's economy has undergone very dramatic changes. From 1999 to 2002 the share of agriculture to GDP almost halved going from 36.5% to 20.1%. Such transformation in the GDP composition was both the result of a drastic absolute decline in agriculture and an opposite positive absolute increase of industry and services. In Mongolia agriculture consists mainly of livestock and only marginally of crops, and throughout the 1990s livestock population has been growing steadily reaching a peak in 1999. Since 1999 a negative sequence of extremely cold and harsh winters, known as *dzuds*, and dry summers that lasted until 2002 reduced the livestock population by almost 30% (see Figure 1.1).

Figure 1.1: Livestock population in Mongolia, 1993-2002



Source: Mongolian Statistical Yearbook, 2002 and IMF country report No 99/4, 1999.

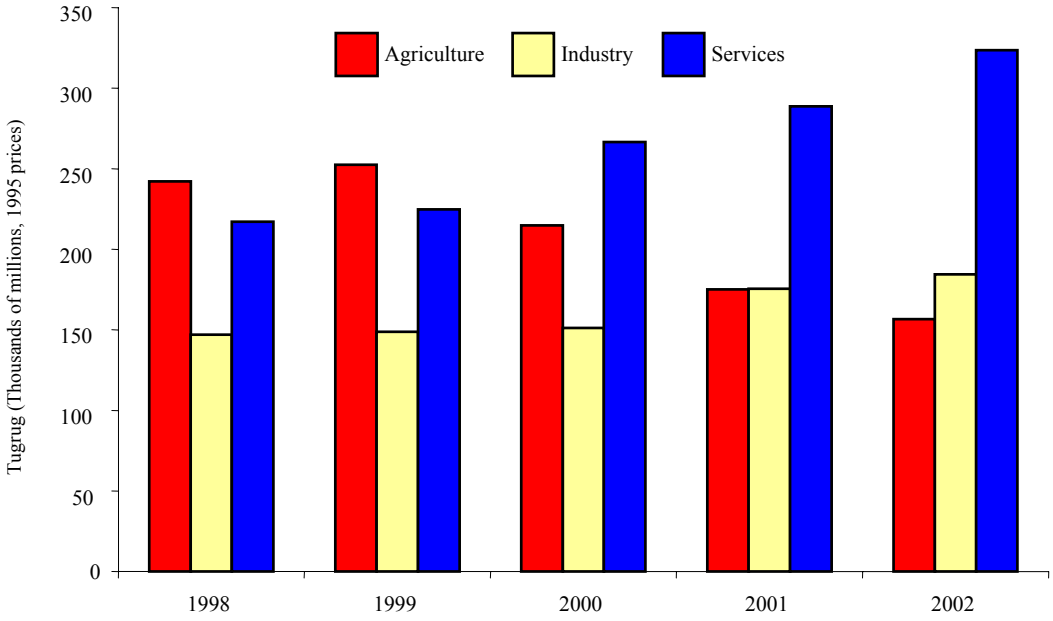
Animal losses of this magnitude were unprecedented, definitely the highest in the last 50 years and much higher than the levels reached at the end of the 1960s, when substantial losses were also recorded[1]. The scale of the disaster was probably augmented by the uncontrolled growth of herds and their bad management[2], but the climatic shock was

[1] Mongolia: Selected Issues and Statistical Appendix, 2002 IMF Country Report No. 02/253.
[2] See Mongolia Human Development Report, 2003, pages 39-40 for more information on the impact of *negdels'* dissolution. Negdels were livestock cooperatives with specific tasks of disaster management

definitely extraordinary. The overall number of livestock in 2002 was lower than the one of ten years earlier and its composition also changed remarkably with a proportional increase of goats and decline of camels, cattle and sheep[3].

However, the reduction of the agriculture share of GDP was also due to an opposite trend in industry and services, which between 1999 and 2002 grew in real terms respectively by 24% and 44%[4] (Figure 1.2). Therefore the collapse of agriculture was counterbalanced by the growth of industry and services, and the overall per capita GDP growth between 1999 and 2002 was a modest 2%.

Figure 1.2: GDP by sectors, 1998-2002



Source: Mongolian Statistical Yearbook, 2002 and IMF country report No 99/4, 1999.

These dramatic changes were accompanied by remarkable migration flows and employment shifts between economic sectors. Movements from aimag centers to the countryside, common in the middle of the 1990s, were reversed by opposite trends that saw an increased urbanization. Such migratory movements seem to be well associated with economic opportunities, and in general with the economic performance of sectors,

(grazing land reserves, veterinary support, provision and maintenance of animal shelters and fodder reserves).

[3] The higher number of goats reflects the new opportunities offered by cashmere trade, but it can also indicate a lower value of the livestock population and its higher vulnerability. In fact, according to a traditional Mongolian way of valuing herd (the *bod* scale), goats are the least worth livestock, followed by sheep, cattle, horses and camels.

[4] Within industry and services the sectors responsible for growth were manufacturing, trade, transport and communication, and financial intermediation. And some of their growth seems to be well correlated with aid flows by sectors (see "Implementing the Economic Growth Support and Poverty Reduction Strategy", Ministry of Finance and Economy, page 10).

that have clear urban/rural characteristics. In fact according to administrative data, the population employed in agriculture reduced both in absolute terms as well as in terms of share of total employment, going from 50% in 1998 to 45% in 2002, while in the same period employment in services increased from 34% to 41%[5].

According to the elaboration of Census data, net recipients of migratory movements were mainly three cities: Ulanbaatar, Erdenet (Bayan-Undur) and Darkhan. In 2000 about 14% of Ulaanbaatar's population 5 years and older moved to the capital since 1995[6]. And even higher percentages are recorded for Erdenet and Darkhan. It is in these centers that services and industries grew sensibly. And there are good reasons to believe that these trends might have only increased in the following years.

1.2. Poverty trends

In this macroeconomic scenario what happened to poverty? Table 1.1 reports poverty estimates obtained with the analysis of the 2002/03 HIES/LSMS. Estimates show that 36% of the population is in poverty and in rural areas poverty is sensibly higher than in urban areas (43% against 30%). Similarly the other two poverty indexes, the poverty gap and the severity of poverty[7], are higher in rural than urban areas. However, it is important to note that these poverty estimates cannot be directly compared with existing previous estimates, mainly for 1995 and 1998. In fact, the methodology used to estimate poverty is very different and dependent on the dissimilar characteristics of the surveys. In particular, the 2002/03 sample made use of an updated sampling frame based on the latest census, while both the 1995 and 1998 LSMS did not possess recent Census data and adopted a very different procedure in the selection of the sample[8].

Therefore, problems of comparability cannot be resolved, and the welfare indicator used for poverty analysis as well as the relevant poverty line are very different. Nonetheless, there is a significant relative difference that should be noted between the current poverty estimates and the previous ones. While previous surveys found that poverty was higher in urban than rural areas, current findings are reversed and rural areas are found to be poorer than urban ones.

[5] Employment shares in the three sectors estimated with the sample are very similar to those of administrative sources: 44.6% in agriculture, 10.7% in industry and 44.8% in services. In addition estimates from the Labour Force Survey also support the accuracy of these values: 46.7% in agriculture, 11.9% in industry and 41.4% in services.

[6] See "Internal Migration and Urbanization in Mongolia: Analysis based on the 2000 Census", NSO 2003.

[7] The poverty gap is an indicator of the depth of poverty, while the severity of poverty takes into account also the inequality among the poor, see section 2.2 for more explanations on these indicators.

[8] Other important differences between the 2002/03 HIES/LSMS and the previous LSMS surveys concern the overall sample design: field procedures, interview structure and questionnaire. Nonetheless, some analysis was undertaken to see the extent of comparability of a modified consumption aggregate, which contained as much as possible similar components, between the 1998 LSMS and the 2002/03 HIES/LSMS, and between the 1999 HIES and the 2002/03 HIES/LSMS. In both cases it emerged that the datasets are not comparable, and that the problem does not lie in the theoretical content of the consumption aggregate, but on how (recall period, sampling procedures) and when (during the year) households' information about consumption expenditure was collected.

Table 1.1: National and urban/rural poverty estimates, 2002

	Headcount	Poverty Gap	Severity
National	36.1 (1.4)	11.0 (0.6)	4.7 (0.3)
Urban	30.3 (1.7)	9.2 (0.7)	4.0 (0.4)
Rural	43.4 (2.4)	13.2 (1.0)	5.6 (0.5)

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

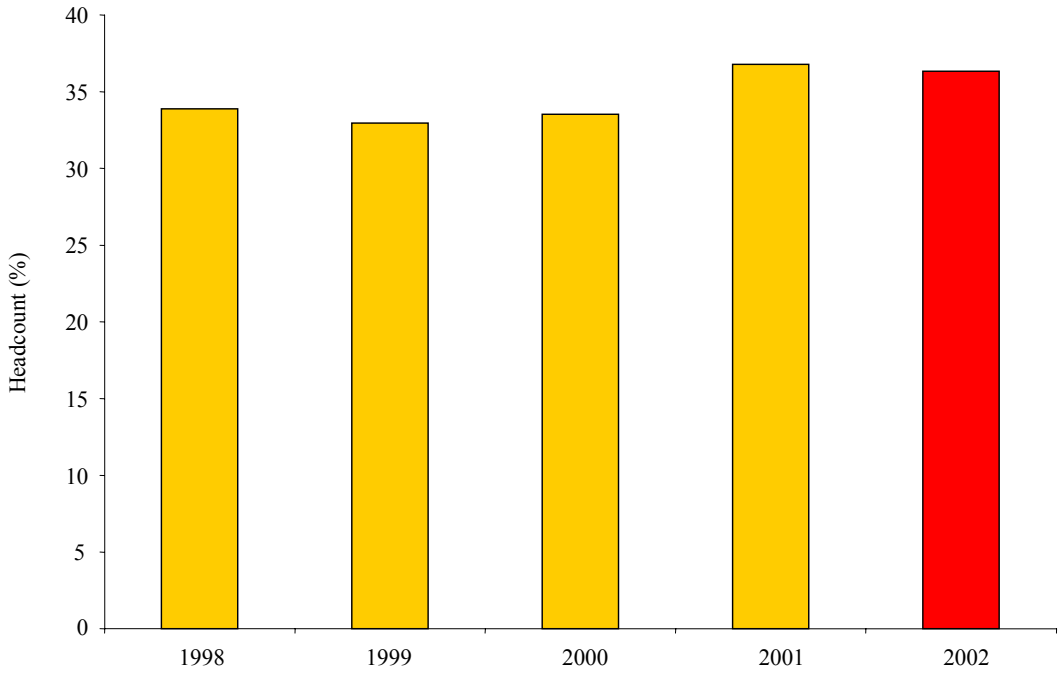
This basic finding is coherently related to the economic changes described earlier. Moreover, in order to understand what happened to poverty in the last five years it is possible to generate some backward projections based on the available information on GDP composition and growth in the three sectors (agriculture, industry and services) as well as employment composition and growth in the same sectors[9]. Such backward projections suggest that poverty might have increased, but overall it was a very modest increase[10] (Figure 1.3). However, these projections are only an indication of one possible scenario of poverty trends assuming that different economic growth in the three sectors is the main driver of poverty changes, while relative inequalities within the sectors remain constant[11]. The hypothesis of constant inequality within sectors is not based on any particular information and given the strong growth, especially within services, it is possible that inequality might have increased within sectors and on the whole. The effect of an increased inequality would be a higher poverty increase in the last five years. Moreover, even though the overall proportion of poor people might not have increased significantly, the geographical composition of poverty is likely to have changed dramatically.

Overall given the tremendous livestock losses, the policy of free migration[12] seems to have helped reducing the poverty increase, although especially in the capital the government now faces the challenge of controlling the immigration flow and the consequent demand of social services and utilities. It is also important to note that aid might have played an important role in mitigating the effects of the livestock losses. In

[9] These projections were performed using the World Bank poverty projections toolkit designed by Datt and Walker, available at: www.worldbank.org/poverty/psia/tools.htm, where it is also possible to find more details on the methodology used to make the projections.
[10] A similar result is obtained using the 1998 LSMS as base data and estimating poverty trends up to 2002.
[11] Other implicit assumption is that household consumption grew at the same level of GDP, and that the employment of the household head is representative of the main source of household income.
[12] Contrary to the population movement restrictions in place before 1991, which controlled movements especially to Ulaanbaatar, the new Mongolian Constitution approved in 1992 declares that every Mongolian citizen has the right to choose where to live in Mongolia. Nevertheless, there still exist some formal conditions to get permission to reside in Ulaanbaatar (see "Internal Migration and Urbanization in Mongolia: Analysis based on the 2000 Census", NSO 2003).

fact, the Ministry of Foreign Affairs estimated that the equivalent of US$ 24 million was received in 2000-01 alone (about 2.4% of GDP) for Dzud relief assistance from donor countries, international organizations and NGOs[13]. Moreover, a survey on the nutritional consequences of the dzud found no significant differences between dzud affected areas and unaffected areas in general nutrition status and prevalence of micronutrient deficiencies among children and their mothers (see Nutrition Research Centre et al. (2003)).

Figure 1.3: Poverty headcount backward projections, 1998-2001



Source: Estimation based on the 2002/03 HIES/LSMS and macroeconomic indicators.

It is also important to mention that the LSMS captures only a very limited number of migrants. Migrants in the LSMS are much less than what Census data suggest. This could have been the result of an under sampling of areas with concentration of recent migration[14] or some inaccuracies in the collection of migration data. If recent migration was indeed under-represented, there are reasons to believe that this in turn might have underestimated the level of poverty. In fact, it is likely that recent migrants might be poorer than the rest of the population.

[13] However, it is not possible to directly assess whether this aid was properly targeted.
[14] To support this hypothesis is the fact that listing operations in some primary sampling units might have only considered officially registered households (see Appendix A).

1.3. Inequality

As mentioned earlier, it is more difficult to understand how the overall level of inequality might have changed in the last five years, but it is nevertheless important to provide inequality estimates for the latest survey. In 2002-03 the estimated Gini coefficient[15] for per capita consumption expenditure, after correcting for price differences, was 0.329. Common values of the index go from 0.2 to 0.5, but comparisons with previous estimates as well as international comparisons should be made with caution. Moreover, they can be very misleading when the index is computed using different welfare indicators[16]. Instead, comparisons are more meaningful across population groups within the country. Table 1.2 reports inequality measures at the national level and within urban and rural areas (together with the Gini index also another inequality measure is reported, namely the Theil index[17]). From the figures reported in Table 1.2 it emerges that inequality is higher in urban than in rural areas.

Table 1.2: Inequality measures

	Gini coefficient	Theil index
National	0.329	0.183
Urban	0.331	0.185
Rural	0.313	0.165

Source: 2002/03 HIES/LSMS.

Inequality can also be analyzed using graphical and more intuitive tools, such as the Lorenz curves. The Lorenz curve ranks the population of a certain country, area or region from the poorest to the richest and associates population proportions with their fraction of total consumption. Figure 1.4 depicts the Lorenz curves for urban and rural areas. The further away is the Lorenz curve from the line of perfect equality, the higher is the level of inequality. The fact that the Lorenz curve for urban areas is always below the one of

[15] The Gini coefficient is a measure of inequality that goes from zero to one, where higher values are associated to higher inequality.

[16] The most common problem is when inequality measures are based on income values rather than consumption. In fact, income based measures of inequality tend to be always higher than respective consumption based measures.

[17] Also this index can take values from 0 to 1, and higher values indicate higher inequality. The advantage of this index is that, whenever inequality is computed in different population groups, it is possible to additively decompose the index in two parts: inequality between groups and inequality within groups. This is done for a number of relevant variables and the results are reported in Appendix D (Table D.2). It emerges that inequality within population groups is always the main component, but it is interesting to see that access to infrastructure services (water access, telephone, heating facilities, toilets) are the variables that identify the biggest differences between population groups.

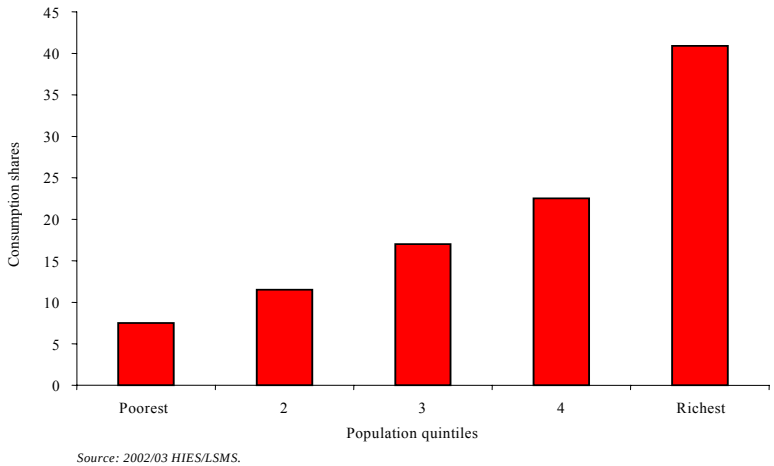
rural areas means that inequality is higher in urban areas independently from the specific index used to measure inequality[18], and it is therefore a robust result.

Figure 1.4: Lorenz curves for urban and rural areas, 2002/03 HIES/LSMS

Source: 2002/03 HIES/LSMS.

Finally, a different, but probably more understandable way to look at inequality is provided in Figure 1.5, which reports the share of national consumption obtained by each population quintile (the population is divided into 5 groups, each containing 20% of the population and ranked from the poorest to the richest). It shows that the richest 20% of the population consumes almost 5.5 times more than the poorest 20%.

Figure 1.5: Consumption shares by population quintiles



Source: 2002/03 HIES/LSMS.

[18] As long as the index satisfies the principle of transfers.

2. WELFARE PROFILE

A welfare profile assesses how living standards vary across different subgroups of the population. This chapter is primarily concerned with the construction of a poverty profile that will show the characteristics of poverty and their correlation with different features of the household and other aspects of welfare. It will separate the poor from the non-poor in order to obtain a better understanding on who the poor are, where they live, their levels of human capital and wealth, the quality of their housing and the type of work they engage in. This may provide useful information for a better design of poverty alleviation efforts.

2.1. Consumption patterns

The first step to construct a poverty profile is to agree on a comparable welfare indicator for the population. For the purposes of this report, the per capita consumption of the household is used[19]. It is therefore important to show what consumption includes and how is distributed within its components.

According to the household survey, the monthly per capita consumption in Mongolia during 2002 was Tugrug 36,750, the equivalent of about US$32 in that year. Table 2.1 displays the average consumption by main expenditure groups and across three different geographical divisions: urban/rural areas, analytical domains (associated also with the degree of urbanization) and regional areas. Urban areas display consumption levels one quarter higher than rural regions. Across analytical domains, the capital ranks first, followed by aimag centers and on the third place both soum centers and the countryside. Among regions, the West shows the lowest level of consumption, twenty percent lower than the national average, whereas the Central the highest[20]. The Highland and the East are in between with similar levels. It is worth noticing that whether by domains or by regions, consumption levels in Ulaanbaatar are substantially above the rest of the country.

How is the pattern of consumption in the country? The share of food is 44% of the total expenditures, with significant differences between urban and rural areas[21]. It is expected that urban areas have lower food shares compared to rural ones due to the relative importance of other components of consumption. Indeed, that is the case. In the former, food accounts only for two fifths of total consumption, while in the latter for more than half of it. Across regions, the capital shows a remarkably low food share of around one third compared to almost three fifths in the countryside. Aimag and soum centers are around the national average. Among regions, the shares are most stable, ranging from 46% in the Central region to 52% in the Highland and the East.

[19] See Appendix B for a detailed explanation on this and the estimation of the poverty line.
[20] Ulaanbaatar is located within the Central region but it is considered as a separate domain due to its significance.
[21] Unfortunately it is not possible to breakdown this consumption into purchases, home-production and in-kind transactions due to the way information was collected.

Among non-food categories, clothing is the most important component and accounts for twelve percent of total consumption, with urban and rural areas displaying similar figures. The value of housing only represents 5% of total consumption. In Ulaanbaatar this share rises to 11%, whereas in the rest of the country is no larger than 3%. The share of education is 7% and it is stable across regions, only in the countryside it represents barely 3%. Health expenditures display a steady share across regions of around 5%. Heating consumption stands at 3% of total consumption, rural households having a half the share of their urban counterparts. Across regions, families in the West appear to devote more resources to this component of their consumption. Transportation and communication represents another 5%. Utilities (i.e. electricity and lighting, water and telephone) account for a similar share. The remaining ten percent of total consumption is comprised by entertainment, toiletries, durable goods and alcohol and tobacco.

Table 2.1: Per capita monthly consumption by main categories

(2002 Tugrug, adjusted by regional and temporal price differences)

	National	Urban	Rural	Analytical domains				Geographical regions			
				Ulaanbaatar	Aimag centers	Soum centers	Countryside	West	Highland	Central a/	East
Consumption											
Food	16,350	15,390	17,545	15,477	15,285	14,920	19,043	14,208	17,669	16,913	18,508
Alcohol and tobacco	1,330	1,451	1,178	1,502	1,391	1,284	1,118	1,107	1,346	1,364	1,060
Education	2,519	3,203	1,668	3,480	2,873	2,628	1,120	2,016	1,993	2,453	1,815
Health	1,919	2,204	1,564	2,152	2,266	2,111	1,252	1,599	1,549	2,422	1,642
Durable goods 1/	410	534	257	601	454	286	240	324	345	312	324
Rent 2/	1,950	3,083	541	4,583	1,291	542	541	569	803	1,046	789
Heating 3/	1,199	1,645	644	1,732	1,541	792	559	1,119	791	1,058	966
Utilities 4/	2,079	2,975	964	3,547	2,292	1,348	745	1,276	1,224	1,782	1,614
Clothing	4,573	4,841	4,239	4,299	5,488	4,310	4,199	4,144	4,839	4,931	4,799
Transportation and communication	1,891	2,236	1,463	2,768	1,599	1,463	1,464	1,427	1,327	1,990	1,146
Others 5/	2,527	2,785	2,205	2,861	2,694	2,196	2,211	1,934	2,500	2,512	2,622
Total	36,747	40,348	32,269	43,002	37,175	31,881	32,491	29,725	34,386	36,781	35,284
Shares											
Food	44	38	54	36	41	47	59	48	51	46	52
Alcohol and tobacco	4	4	4	3	4	4	3	4	4	4	3
Education	7	8	5	8	8	8	3	7	6	7	5
Health	5	5	5	5	6	7	4	5	5	7	5
Durable goods 1/	1	1	1	1	1	1	1	1	1	1	1
Rent 2/	5	8	2	11	3	2	2	2	2	3	2
Heating 3/	3	4	2	4	4	2	2	4	2	3	3
Utilities 4/	6	7	3	8	6	4	2	4	4	5	5
Clothing	12	12	13	10	15	14	13	14	14	13	14
Transportation and communication	5	6	5	6	4	5	5	5	4	5	3
Others 5/	7	7	7	7	7	7	7	7	7	7	7
Total	100	100	100	100	100	100	100	100	100	100	100

a/ Excludes Ulaanbaatar.

1/ Estimation of the monetary value of the consumption derived from the use of durable goods.

2/ Estimation of the monetary value of the consumption derived from occupying the dwelling. If the household rents its dwelling, the actual rent will be included instead of the imputed rent.

3/ Includes central and local heating, firewood, coal and dung.

4/ Includes electricity and lighting, water and telephone.

5/ Includes recreation, entertaiment, beauty and toilet articles, and household utensils.

Source: 2002/03 HIES/LSMS.

2.2. Poverty measures

What are the incidence, depth and severity of poverty in Mongolia? The incidence of poverty in the country is 36.1% (Table 2.2), which means that around 900,000 individuals are considered poor[22]. In other words, 36 out of every 100 Mongolians do not have the necessary means to purchase the value of a minimum food and non-food bundle. Although the poverty headcount is very easy to understand, it does not provide information on how close or far the poor are from being able to satisfy their basic needs or how consumption is distributed among the poor. This could be a serious limitation when evaluating alternative policy options, for example, the implementation of a particular policy could improve the welfare of the poor leaving unchanged the poverty incidence. In order to obtain a more complete description of the poverty situation, two other measures are also considered: the poverty gap and the severity of poverty.

Table 2.2: National poverty rates

Headcount	Poverty Gap	Severity
36.1	11.0	4.7
(1.4)	(0.6)	(0.3)

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

The poverty gap stands at 11% and estimates the average shortfall in consumption relative to the poverty line. This implies that, on average, the consumption of each person in the country is 11 percent below the poverty line. The indicator has a more practical, although quite hypothetical, interpretation. If all poverty gaps are added, that amount will be the minimum transfer of income necessary to bring all poor population out of poverty[23]. Hence a total annual transfer of Tugrug 80,848 millions, or US$ 70 millions, would be required to eliminate poverty[24].

[22] Total population for 2002 was 2,475,400 individuals according to the 2000 Census projections.
[23] This estimation assumes both perfect targeting and full consumption of the transfer. Perfect targeting implies that every poor will receive a transfer equal to the difference between her consumption and the poverty line, and that no person above the poverty line will receive anything. If the recipient of the transfer also fully consumes it, her consumption will be equal to the poverty line and that person will no longer be considered as poor. Lastly, it will also require no transaction costs.
[24] This amount is equivalent to 7% of the 2002 GDP, and was calculated as follows = 0.11 x national poverty line of Tugrug 24,743 x 12 months x 2,475,400 persons. A few caveats regarding these rather speculative numbers are worth mentioning though. The first is that in practice perfect targeting is impossible, transaction costs will be too high. The second is that even if it were possible, there would be no guarantee that the transfer will be fully consumed by the recipients. Finally, it would make little sense to transfer that amount to the poor because strong disincentive effects are likely to appear.

The third poverty indicator is the severity of poverty. In contrast to the headcount or to the poverty gap, this measure is sensitive to the distribution of consumption among the poor[25]. For instance, if a transfer occurs from one poor household to a richer household, the level of poverty should increase. Even though the poverty incidence and the poverty gap will be unaffected, the severity indicator will indeed rise. The severity measure is 4.7 percent. Unfortunately, there is no easy or intuitive interpretation of this indicator. However, it helps to compare and rank poverty across different groups when similar incidences and gaps are found.

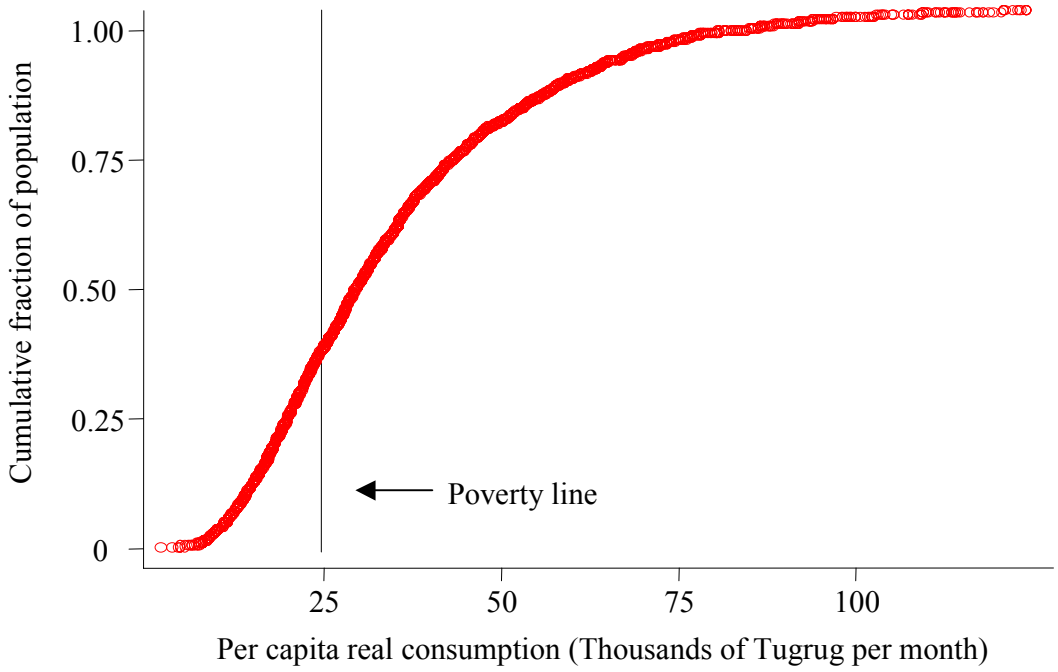
2.3. Sensitivity to the level of the poverty line

A natural concern that arises at this stage is to find out how sensitive the poverty measures are with respect to the level of the poverty line. Yet considerable effort has been put in deriving a poverty line following a fairly established methodology and trying to be as transparent and objective as possible, an unavoidable degree of arbitrariness is involved in the process. Many explicit and implicit assumptions have been made along the way and not everybody may agree with them. Other poverty lines might be equally appealing and justified.

Stochastic dominance analysis allows us to find the range of poverty lines over which poverty comparisons are robust. It relies on graphical tools and focuses on the entire distribution of consumption. Figure 2.1 shows the cumulative distribution function of per capita consumption in Mongolia and provides an example of this sort of techniques[26]. For a given consumption level on the horizontal axis, the curve indicates the percent of the population with an equal or lesser level of consumption on the vertical axis. If one thinks of the chosen consumption level as the poverty line, the curve will show the associated poverty headcount, and hence it can be seen as a "poverty incidence curve". It is simple then to assess how much the headcount will change when the poverty line is shifted upward or downwards. At a poverty line of Tugrug 24,743 per person per month, around 36% of the population are poor. Nonetheless, given that the slope of the distribution is relatively steep around that level, it is likely that small changes in the poverty line will have a larger impact on the poverty incidence.

[25] It weights the shortfall in consumption relative to the poverty line more heavily the poorer the person is.
[26] Figures shown cover up to Tugrug 125,000 per person per month, which is a value close to the 99th percentile of the total distribution of per capita consumption.

Figure 2.1: Cumulative distribution of per capita consumption

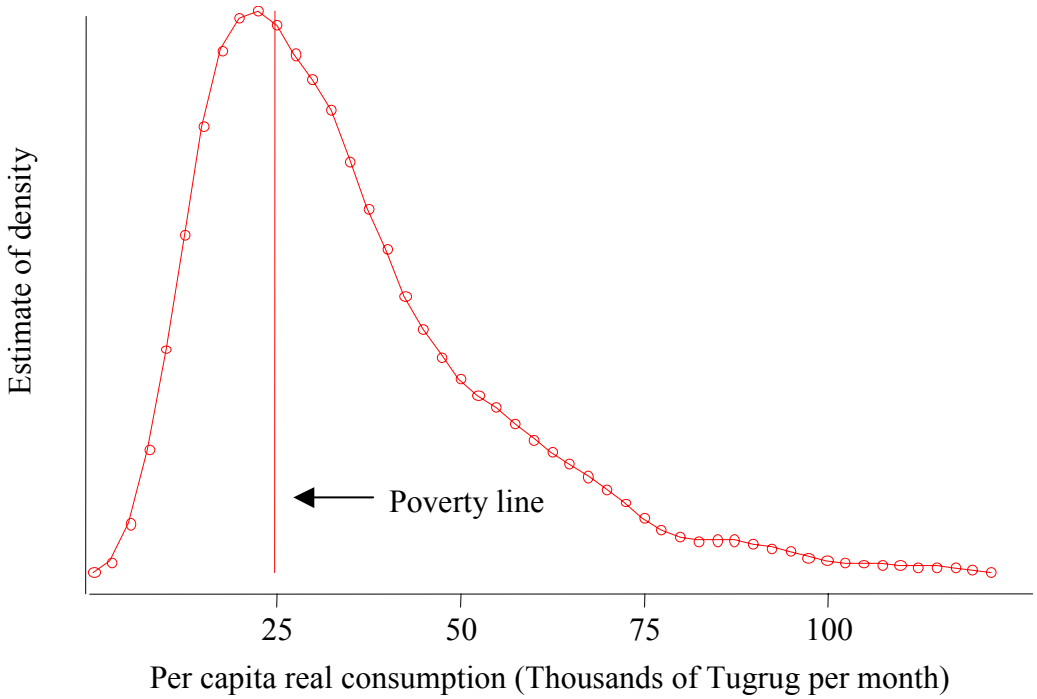


Source: 2002/03 HIES/LSMS.

The concentration of households around the poverty line can be illustrated with a related concept, the density function[27]. Figure 2.2 depicts the kernel density estimate of the per capita consumption. It shows two important characteristics of the distribution *around* the poverty line. First, a significant clustering occurs close to that point. Second, there is more probability mass below the poverty line than above it. The implication of both features is that the poverty measures are less sensitive to scaling up the poverty line than to scaling it down. Table 2.3 confirms this by estimating the headcount when the poverty line is scaled up and down. On the one hand, it reveals that 12 percent of the population lies within plus or minus 10 percent of the poverty line and almost one third within plus or minus 25 percent. On the other hand, when the poverty line is doubled, the incidence of poverty increases in less (from 36 to 78%), but when the poverty line is halved, the headcount decreases much more (from 36 to 7%).

[27] The notion of the density function is very similar to that of histograms. Traditional histograms divide a range of the variable of interest into certain number of intervals of equal width and draw a vertical bar for each interval with height proportional to the relative frequency of observations within each interval. A kernel density function can be thought of as a "smoothed" histogram. It estimates the density, or relative frequency, at every point rather than at every interval. Hence, say in the case of consumption, the area between two consumption levels is the proportion of the population with consumption within that range (it follows that the total area under the curve is 1 or 100 percent of the population).

Figure 2.2: Density function of per capita consumption



Source: 2002/03 HIES/LSMS.

Table 2.3: Poverty and scaling of the poverty line

Scaling of Poverty Line	Headcount		
	National	Urban	Rural
200	78.3	73.2	84.7
150	62.9	56.0	71.5
125	50.6	44.0	58.8
110	41.5	35.5	49.0
100	36.1	30.3	43.4
90	29.9	24.7	36.4
75	20.2	16.9	24.2
50	6.5	5.7	7.4

Source: 2002/03 HIES/LSMS.

2.4. Geography

Mongolia presents a very diverse geography. It is not only a landlocked country but also displays a high altitude level. Its territory encompasses deserts, steppes, forests, lakes and high mountains, each one with its own particular features in terms of climate, soil, flora and fauna. These characteristics are important to determine living standards across the country and pose particular challenges for economic development. What is then the link between poverty and geography?

There are substantial disparities in poverty across regions. Table 2.4 displays poverty measures considering a division of the country based on geographical areas. Mongolia can be divided in 4 main regions: West, Highland, Central and East. Ulaanbaatar is located within the Central region but is considered as a separate one due to its significance. Poverty decreases as one moves eastward. The poverty incidence in the West reaches more than half of its population, almost two fifths in the Highland and around one third in both Central and East. Ulaanbaatar has the lowest incidence of poverty, slightly more than one quarter of the capital residents is poor. The West comprises one sixth of the population but one quarter of the poor. By contrast, the capital accounts for one third of the population and one fifth of the poor. Another quarter of the poor live in the Highland, a fifth in the Central area and the remaining tenth in the East.

Table 2.4: Poverty and geography

	National	West	Highland	Central	East	Ulaanbaatar
Headcount	36.1	51.1	38.7	34.4	34.5	27.3
	(1.4)	(3.5)	(2.9)	(3.0)	(4.4)	(2.6)
Poverty Gap	11.0	14.6	12.3	10.1	12.4	8.1
	(0.6)	(1.3)	(1.3)	(1.4)	(2.3)	(1.0)
Severity	4.7	5.7	5.2	4.3	6.6	3.3
	(0.3)	(0.7)	(0.7)	(0.8)	(1.6)	(0.5)
Memorandum items:						
Share below PL (%)	100.0	24.0	25.8	18.6	8.9	22.8
Number below PL ('000)	894.0	214.4	230.5	166.3	79.1	203.8
Population share (%)	100.0	17.0	24.1	19.5	9.3	30.2
Population ('000)	2,475.4	419.8	596.1	483.4	229.0	747.3
Household size	4.3	4.6	4.1	4.1	4.4	4.4
Dependency ratio (%)	43.3	46.7	43.0	44.3	45.2	40.6
Children (% household size)	31.2	37.1	31.2	29.7	36.0	27.5
Age of household head	44.5	42.5	43.1	44.7	41.9	47.3
Male household head (%)	82.5	91.6	85.2	79.4	85.7	76.6
Urbanization (%)	55.4	34.8	31.3	40.6	42.0	100.0

Note: Total population for 2002 is based on the projections from the 2000 Census. Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Urbanization is another factor to take into account. For instance, the West and the Highland, the two poorest regions, are the less urbanized ones. Generally rural areas are less developed than urban ones and hence show lower levels of living standards. Table 2.5 shows a division of the country based on urban and rural areas, and on the four analytical domains considered for the survey design. Poverty in urban domains is significantly lower than in rural areas, 30% and 43% respectively. Among urban domains, Ulaanbaatar is less poor than aimag centers. However, the incidence of poverty in soum centers and the countryside, both rural areas, is very much alike, with soum centers being slightly worse-off. Fifty five percent of the population lives in urban areas, but only around forty five percent of the poor, whereas the figures in rural areas are the opposite. One third of the poor lives in the countryside, one quarter in aimag centers and one fifth in the soum centers.

Table 2.5: Poverty and analytical domains

	National	Urban			Rural		
		Total	Ulaanbaatar	Aimag centers	Total	Soum centers	Country side
Headcount	36.1	30.3	27.3	33.9	43.4	44.5	42.7
	(1.4)	(1.7)	(2.6)	(2.2)	(2.4)	(3.0)	(3.3)
Poverty Gap	11.0	9.2	8.1	10.5	13.2	14.4	12.6
	(0.6)	(0.7)	(1.0)	(1.0)	(1.0)	(1.5)	(1.3)
Severity	4.7	4.0	3.3	4.7	5.6	6.4	5.1
	(0.3)	(0.4)	(0.5)	(0.7)	(0.5)	(0.9)	(0.7)
Memorandum items:							
Share below PL (%)	100.0	46.5	22.8	23.7	53.5	20.0	33.6
Number below PL ('000)	894.0	415.3	203.8	211.5	478.7	178.5	300.2
Population share (%)	100.0	55.4	30.2	25.2	44.6	16.2	28.4
Population ('000)	2,475.4	1,372.1	747.3	624.8	1,103.3	400.8	702.5
Household size	4.3	4.4	4.4	4.4	4.2	4.4	4.1
Dependency ratio (%)	43.3	41.8	40.6	43.3	45.2	42.4	46.6
Children (% household size)	31.2	29.7	27.5	32.2	33.0	33.2	32.9
Age of household head	44.5	46.2	47.3	45.0	42.4	43.7	41.7
Male household head (%)	82.5	79.6	76.6	83.1	86.1	85.3	86.5

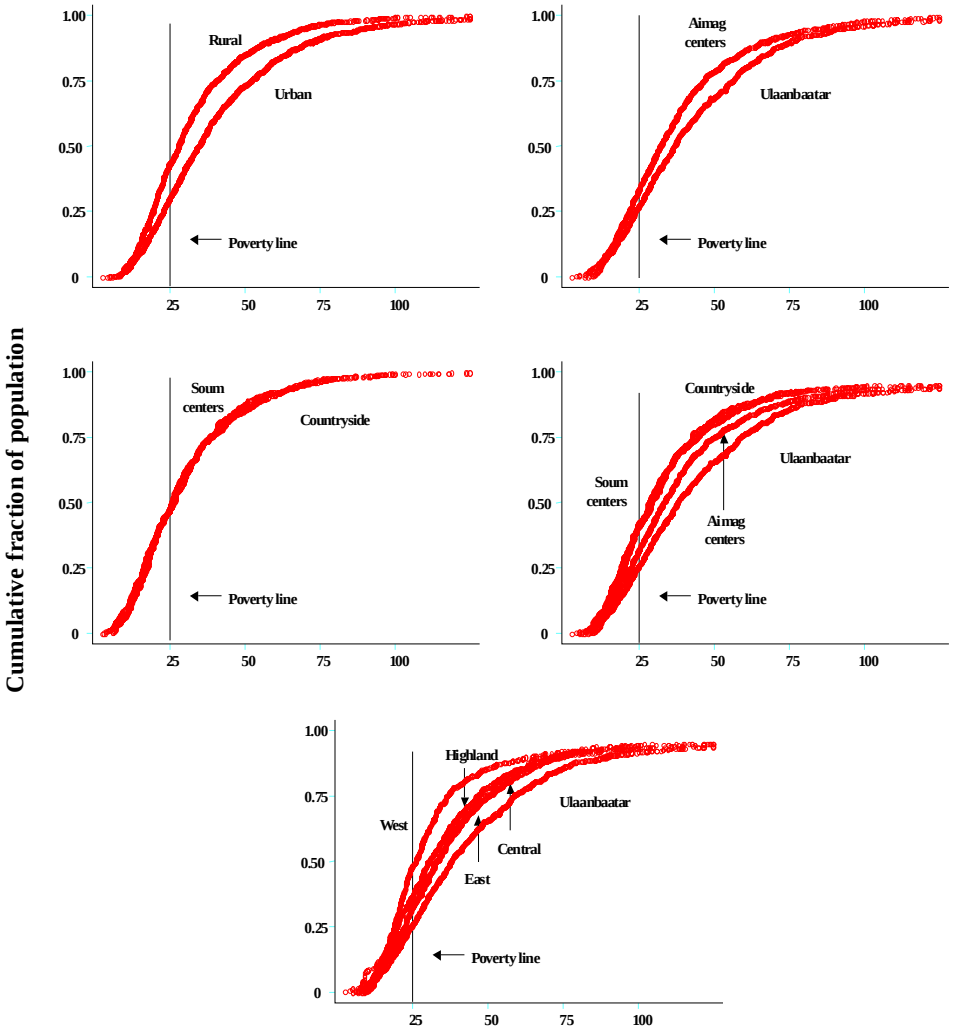
Note: Total population for 2002 is based on the projections from the 2000 Census. Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

What is the sensitivity of these findings to the level of the poverty line? Again, stochastic analysis allows us to evaluate the robustness of the results. At the regional level, the West is the poorest region and Ulaanbaatar is the least poor (Figure 2.3). Nothing conclusive can be said regarding the other three regions because their curves intersect each other, which means that their ranking will be affected depending on the chosen poverty line[28].

[28] By plotting two or more per capita consumption cumulative functions in the same graph, it is possible to infer first-order stochastic dominance. Distribution A first-order stochastically dominates distribution B if for any given level of per capita consumption, the share of the population with a lesser or equal level of consumption will always be lower in distribution B. In other words, if curve A always lies above curve B, distribution B will have a higher level of welfare and hence lower poverty. However, if the curves intersect

Regarding the urban-rural divide, the three previous points stand. First, urban areas are always better-off than rural areas. Second, Ulaanbaatar is less poor than the aimag centers. Third, although the ranking between soum centers and countryside is quite sensitive to the chosen poverty line, the poverty incidence is almost the same in both domains. Overall then, the capital is the least poor, followed by aimag centers and then by rural areas.

Figure 2.3: First order dominance results: Cumulative distribution of per capita consumption



Per capita real consumption (Thousands of Tugrug per month)

Source: 2002/03 HIES/LSMS.

each other, the criteria does not apply and it is not possible to infer which distribution has a higher level of welfare.

2.5. The seasonality of poverty

A relevant feature of poverty in Mongolia is its seasonality. In particular livestock activities, but also other factors determine remarkable fluctuations in consumption levels along the year[29]. Typically summer time (the third quarter) is a period of relative abundance while the long winters are associated with lower consumption, interrupted only by the increased spending associated to the festivity period of the new lunar year, which generally falls in January or February. From Table 2.6 it is evident how poverty measures fluctuate during the year, with the poverty headcount higher by 5 percentage points in the second and fourth quarters. From the memorandum items reported in the table it is clear that these estimates are not related to different household characteristics in the four quarters: urbanization and demographic features do not show significant variations. This supports the argument that poverty fluctuations are the result of the seasonality characteristic of the Mongolian economic cycle.

Table 2.6: The seasonality of poverty

	National	Quarter I	Quarter II	Quarter III	Quarter IV
Headcount	36.1	29.1	40.3	33.5	41.2
	(1.4)	(3.0)	(2.7)	(2.8)	(2.9)
Poverty Gap	11.0	8.0	11.7	10.3	13.7
	(0.6)	(1.0)	(1.1)	(1.2)	(1.4)
Severity	4.7	3.1	4.9	4.4	6.1
	(0.3)	(0.5)	(0.6)	(0.6)	(0.8)
Memorandum items:					
Share below PL (%)	100.0	19.6	25.9	23.6	30.9
Population share (%)	100.0	24.3	23.2	25.4	27.0
Household size	4.3	4.3	4.3	4.3	4.4
Dependency ratio (%)	43.3	42.8	42.6	44.4	43.3
Children (% household size)	31.2	31.7	30.9	30.6	31.6
Age of household head	44.5	43.5	44.7	45.4	44.3
Male household head (%)	82.5	83.9	84.3	80.6	81.6
Urbanization (%)	55.4	55.6	58.5	54.9	53.1

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Both urban and rural areas are affected by seasonality fluctuations, but in rather differing ways (this is not shown in the table). Urban areas enjoy a consumption surge in the first quarter, but they are not affected by any seasonality effect in the summer period. On the

[29] It is important to mention that, as explained in appendix B, the consumption aggregate has been adequately corrected for seasonal price differences, and some of the consumption components (rent and utilities) are also adjusted by seasonal consumption because are derived from annual consumption before being expressed in monthly terms. However, food consumption as well as non-food consumption was collected on a quarterly basis.

contrary, in rural areas the third quarter emerges as the period with the highest consumption. One important message associated to these results is that households, especially in rural areas, are unable to smooth consumption and this requires both improved market integration as well as policies that can strengthen the role of credit markets.

2.6. Household composition

Households differ in their demographic composition, some are comprised by nuclear or by extended families, others have a high proportion of children, and some are comprised only by elderly people. Is there any correlation between poverty and household composition? Table 2.7 shows first how poverty varies with the size of the household. The incidence of poverty increases monotonically with household size. This is hardly surprising given that our welfare indicator is per capita consumption, which implicitly assumes that there are neither different needs among members nor economies of size within the household[30]. The likelihood of being poor if one lives in households of up to three members is barely more than 10 percent. One of every five Mongolians lives in those households but they make up for less than one tenth of the poor. The poverty incidence in households of four and five members, the typical household size in the country, is 24 and 34 percent respectively. These households comprise just less than half of the population and two out of every five poor. By contrast, poverty reaches at least 50 percent among households of more than five members, which represent a third of the population but more than half of the poor. The level of poverty is particularly dramatic among those households with at least eight members, where seven out of every ten people is below the poverty line and they represent a fifth of the poor.

Table 2.7: Poverty and household size

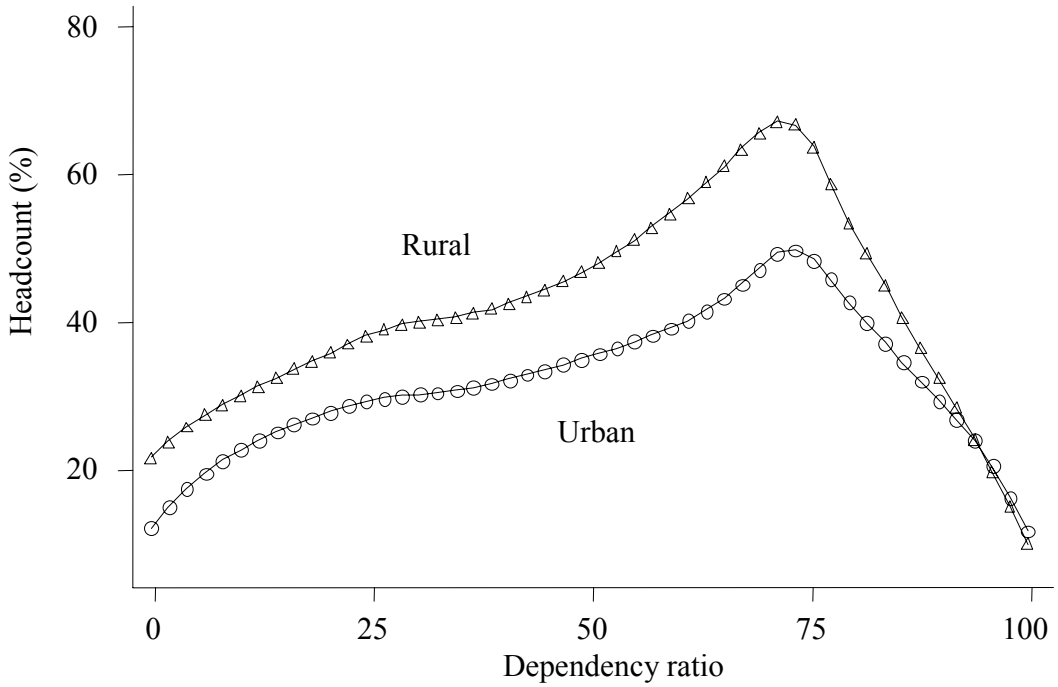
	National	Household size							
		1	2	3	4	5	6	7	8 plus
Headcount	36.1	1.2	7.4	15.5	23.5	34.4	48.5	57.4	69.4
	(1.4)	(0.9)	(1.8)	(1.7)	(2.0)	(2.2)	(3.0)	(4.0)	(3.7)
Poverty Gap	11.0	0.4	1.8	3.6	6.2	9.1	14.9	19.0	26.1
	(0.6)	(0.4)	(0.4)	(0.5)	(0.6)	(0.8)	(1.2)	(1.7)	(2.3)
Severity	4.7	0.2	0.5	1.2	2.3	3.5	6.1	8.1	13.3
	(0.3)	(0.2)	(0.1)	(0.2)	(0.3)	(0.4)	(0.7)	(0.9)	(1.6)
Memorandum items:									
Poor share (%)	100.0	0.0	0.9	5.6	15.0	21.2	21.2	15.7	20.5
Population share (%)	100.0	1.3	4.2	13.0	23.0	22.3	15.8	9.9	10.7
Dependency ratio (%)	43.3	61.4	46.8	37.6	42.2	43.4	44.0	43.2	42.4
Children (% household size)	31.2	0.0	11.5	26.2	36.7	37.9	39.9	39.4	37.3
Age of household head	44.5	56.3	50.1	42.0	40.5	43.5	44.5	47.1	49.5
Male household head (%)	82.5	43.7	67.0	79.9	89.1	87.5	91.4	89.8	83.2

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

[30] The sensitivity of these two assumptions to eight different family compositions is examined in more detail in Appendix C.1.

A second way to analyze the demographic composition of the households is through the dependency ratio. This is a common indicator to capture the demographic composition of the families. It will be defined as the ratio between the non-working age population and the number of members in the household[31]. Thus it represents the share of "dependants" in the household. Figure 2.4 displays the relationship between the poverty incidence and the dependency ratio for urban and rural areas. The higher the dependency ratio, the higher the poverty experienced by the household. Usually a higher share of children and elderly people relative to the total number of members in the family means that "earners" have to support more people, hence there is less income and consumption available to each household member and therefore more poverty. This relationship holds up to values of 75%, above these levels poverty declines, which is likely to reflect the fact that in households where the share of dependants is really high, these households are mainly comprised by elderly people still working or receiving some steady income, like a pension or remittances from a relative, that defends them against poverty[32].

Figure 2.4: Poverty and dependency ratio



Source: 2002/03 HIES/LSMS.

[31] Alternatively, it can be also defined as the ratio between the non-working-age population and the working-age population, typically those less than 15 or more than 64 to those 15 to 64 years old. Thus it represents the number of "dependants" for each "earner" in the household. However, in Mongolia a different age-cut is used to define working-age population: men aged 16 to 59 and women aged 16 to 55.

[32] Indeed, 80% of the households with dependency ratios higher than 75 are comprised of one or two elderly members.

2.7. Characteristics of the household head

A common practice when doing poverty comparisons is to classify households according to the characteristics of the household head[33]. Although not without limitations, it does provide a simple and useful way to make comparisons across households[34]. Often living standards and household demographic composition are linked with the characteristics of the head, who is likely to be the main source of economic support within the household. For instance, a head with tertiary education is likely to live in urban areas and have a smaller than average number of children. In this section, the connection between poverty and age, gender, education, employment and migratory status of the household head is examined.

Age and gender

What is the link between the age of the household head and poverty? Table 2.8 displays the poverty measures according to three age groups of the household head, 15 to 29 years old, 30 to 49 and 50 and more. The incidence of poverty is lowest among the first group, increases with the second and finally falls, although remains higher than at young ages. More than three out of five poor live in households with middle-aged heads, a quarter have an older head and one tenth a younger one. Differences in the composition of the households across these three groups may explain much of the observed poverty levels. For instance, children account for forty percent of the family size among households with middle-aged heads but decreases to less than that among those with older heads, which also are more likely to be headed by a woman.

[33] The LSMS applies a precise definition to identify the head of the household. It is the person who is acknowledged as the head by the other members, plays the main role in organizing others, bears full responsibility for household problems, and takes most of the household financial decisions.

[34] For instance, sometimes the eldest person is considered as the head as a sign of respect, although he or she does not fulfill the given definition. Another example is when female widows, who may be in practice the heads of the household, refer to their eldest son as the head of the family.

Table 2.8: Poverty and age of the household head

	National	15 - 29	30 - 49	50 plus
Headcount	36.1	27.0	40.2	31.6
	(1.4)	(3.0)	(1.8)	(2.1)
Poverty Gap	11.0	7.5	12.2	10.0
	(0.6)	(1.0)	(0.7)	(0.8)
Severity	4.7	2.9	5.2	4.3
	(0.3)	(0.5)	(0.4)	(0.5)
Memorandum items:				
Household size	4.3	3.4	4.7	4.1
Dependency ratio (%)	43.3	35.9	42.2	48.5
Children (% household size)	31.2	32.4	40.8	14.6
Age of household head	44.5	25.6	39.3	61.6
Male household head (%)	82.5	93.7	85.6	72.5
Share below PL (%)	100.0	8.4	64.9	26.7
Population share	100.0	11.3	58.2	30.5

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Is the pattern the same when comparing female against male-headed households? Available evidence suggests that female-headed families are better off at younger ages, but after the head reaches around 30 years old they are consistently worse off (Figure 2.5). These results must be taken with caution because the comparison is assessing families with very dissimilar structures. More than four of every five female heads are widows, divorced or separated, while more than nine out of ten male heads are married. Female heads are older and more likely to live in rural areas. Finally, nationwide, female-headed households comprise around fifteen percent of the total households and a similar share of the poor.

Figure 2.5: Poverty, age and gender of the household head

Source: 2002/03 HIES/LSMS.

Education

A fundamental indicator of human capital is education. It is widely recognized as one of the main factors to increase the living standards of the population. People with none or little education are likely to be employed in labor-intensive industries, which generally exhibit less productivity and hence lower salaries, have a small degree of labor mobility and are more vulnerable to adverse shocks. Education enlarges not only job opportunities but also helps people to realize the significance of other aspects of welfare, like the importance of a better health or to participate more actively in society.

Table 2.9 displays information on poverty measures by the highest level of education obtained by the household head. Before commenting on the relationship between education and poverty, it is important to note that education levels of household heads are very high, more than 80 percent of the population lives in households where the head has finished at least the 8th grade of secondary and one quarter of Mongolians has a household head with tertiary education. By contrast, less than one fifth lives in households where the head has no education or only primary school. As expected, the higher the level of instruction completed, the less the poverty experienced. The returns to education seem to increase considerably if the head has finished complete secondary, for levels lower than that, the incidence of poverty is around 45 percent but for higher educational attainments only 25 percent. This hides differences within each of these two broad groups. Poverty levels are similar for heads with no education, only primary or up to 8th grade of secondary. But completion of secondary reduces the headcount measure to

almost one third, having a diploma to one quarter and receiving at least a bachelor degree to almost one tenth. Vocational education appears to be the exception among higher levels of instruction. Urban and rural disaggregation introduces two minor changes. In soum centers and the countryside only a diploma or a university degree are found to reduce the level of poverty, completing secondary or vocational education does not seem to be enough. The counterpart of this finding is that in the capital and aimag centers, these two levels do decrease the chances of being poor.

Table 2.9: Poverty and highest level of education completed by the household head

	National	None	Primary	Secondary 8th grade	Complete Secondary	Vocational	Diploma	University
Headcount	36.1	45.8	45.6	45.5	34.9	40.7	23.4	11.6
	(1.4)	(4.9)	(3.6)	(2.3)	(2.3)	(3.4)	(2.5)	(2.1)
Poverty Gap	11.0	12.8	16.4	13.8	9.3	13.1	6.7	2.9
	(0.6)	(1.7)	(1.7)	(0.9)	(0.9)	(1.5)	(0.9)	(0.7)
Severity	4.7	4.8	7.9	5.7	3.6	6.0	2.7	1.1
	(0.3)	(0.9)	(1.1)	(0.5)	(0.4)	(0.9)	(0.5)	(0.3)
Memorandum items:								
Household size	4.3	3.2	4.2	4.6	4.4	4.5	4.3	4.1
Dependency ratio (%)	43.3	59.3	49.7	42.1	41.6	43.4	38.4	39.1
Children (% household size)	31.2	19.3	24.7	35.0	36.1	38.8	28.8	25.7
Age of household head	44.5	55.9	52.3	41.0	38.8	40.7	46.3	46.7
Male household head (%)	82.5	60.7	73.1	89.2	88.1	83.7	80.5	82.7
Share below PL (%)	100.0	5.4	17.9	34.6	18.2	11.5	8.8	3.7
Population share	100.0	4.2	14.2	27.5	18.8	10.2	13.6	11.5

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Employment

One of the most evident determinants of household welfare is whether or not their members can participate in the labor market and particularly, if employed, the type of job that they can engage in. In Mongolia, this issue received some attention since the transition to a market economy started. Initially, the shrinkage of manufacturing and the public administration pushed many people back to agriculture. However, in recent years the combination of natural disasters and the surge of the services sector have turned that trend.

Table 2.10 combines information on participation on the labor force, main sector of employment and poverty[35]. Population living in households where the head is currently working has higher living standards than those whose head is either unemployed or out of the labor force. Among the employed, poverty levels are lower in families whose head works in services compared to those in industries and significantly lower than those in

[35] A person participates in the labor force if she worked during last week, did not work but had a job or did not work, did not have a job but looked for work. Otherwise, she is considered out of the labor force. No age considerations were taken into account for the estimation of Table 2.10.

agriculture. More than a third of the poor lives in households whose head engages in agriculture, a quarter in services, less than a tenth in industry and almost a third in families whose head is not actively participating in the labor market. The distribution of the population follows a very similar pattern, except that agriculture decreases its share and the contrary occurs to services.

Table 2.10: Poverty and labor force participation of the household head

	National	Employed				Unemployed	Out of Labor Force
		Total	Agriculture	Industry	Services		
Headcount	36.1	33.6	41.0	33.2	26.9	48.7	41.6
	(1.4)	(1.7)	(3.0)	(3.4)	(1.9)	(5.4)	(2.2)
Poverty Gap	11.0	9.7	12.0	9.1	7.7	16.7	14.0
	(0.6)	(0.6)	(1.2)	(1.3)	(0.7)	(2.4)	(1.1)
Severity	4.7	3.9	4.8	3.6	3.1	7.4	6.6
	(0.3)	(0.3)	(0.6)	(0.7)	(0.3)	(1.3)	(0.7)
Memorandum items:							
Household size	4.3	4.4	4.2	4.4	4.5	4.7	4.1
Dependency ratio (%)	43.3	40.7	44.8	35.8	38.1	42.2	50.4
Children (% household size)	31.2	33.9	33.4	33.2	34.6	40.9	23.0
Age of household head	44.5	41.0	41.0	39.7	41.4	37.7	54.3
Male household head (%)	82.5	86.7	88.3	89.0	84.4	86.3	71.1
Share below PL (%)	100.0	66.5	34.2	8.1	24.3	4.0	29.4
Population share	100.0	71.5	30.2	8.8	32.6	3.0	25.5

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

The relationship between poverty and employment can be further explored by looking at the sector of employment. Table 2.11 separates employed household heads in herders, working in the private sector, in the public sector and in state companies[36]. An additional second breakdown is done among those out of the labor force into pensioners and the rest. A few findings are worth emphasizing. First, the population in households whose head is involved in livestock activities experiences higher poverty than those whose head is employed anywhere else. Second, public and especially state jobs seem to offer better living standards to the twenty percent of Mongolians living in those households. Third, poverty levels in households with heads employed in the private sector are somewhere in between, although much closer to those rearing livestock than to heads with public posts.

[36] After transition, state companies lost their major role in the economy. Nowadays they are limited to a few sectors in the economy, mainly utilities, transportation and textiles.

Table 2.11: Poverty and sector of occupation of the household head

	National	Employed				Unemployed	Out of Labor Force	
		Herders	Private	Public	State		Pensioners	Others
Headcount	36.1	39.2	34.7	25.9	21.6	48.7	35.7	51.4
	(1.4)	(3.2)	(2.2)	(2.5)	(5.7)	(5.4)	(2.7)	(3.1)
Poverty Gap	11.0	11.4	9.9	7.5	4.9	16.7	10.9	19.2
	(0.6)	(1.2)	(0.8)	(0.9)	(1.8)	(2.4)	(1.1)	(2.0)
Severity	4.7	4.5	4.1	3.0	1.7	7.4	4.7	9.6
	(0.3)	(0.7)	(0.4)	(0.4)	(0.8)	(1.3)	(0.6)	(1.4)
Memorandum items:								
Household size	4.3	4.2	4.4	4.5	4.5	4.7	3.9	4.6
Dependency ratio (%)	43.3	45.0	39.4	37.2	32.2	42.2	57.0	37.5
Children (% household size)	31.2	32.6	36.0	33.5	31.6	40.9	17.1	34.4
Age of household head	44.5	41.1	40.0	42.3	41.4	37.7	61.9	39.6
Male household head (%)	82.5	88.6	87.3	82.0	91.6	86.3	63.1	86.8
Share below PL (%)	100.0	28.8	23.2	12.8	1.8	4.0	15.6	13.8
Population share	100.0	26.5	24.1	17.9	3.0	3.0	15.8	9.7

Note: Pensioners refer to household heads receiving any pension or benefit from the state. Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Fourth, families with an unemployed head experience a fifty percent chance of being poor. However, they comprise less than five percent of the poor. Fifth, there are two very different groups among heads that are not participating in the labor market: pensioners and non-pensioners. The probability of being poor in households where the head is a pensioner is significantly lower than in families where the head is not, almost one third compared to one half. Each one of these two groups comprise around fifteen percent of the poor. Sixth, demographic indicators provide some useful information. For instance, those employed in public and state jobs tend to be older than those in the private sector. Pensioners are the eldest, but heads out of the labor force that are not pensioners have similar ages than those working. Finally, the population living with a head that is a pensioner has the highest chance of having also a female head.

Migrant status

As it was pointed out in the previous section, changes in the structure of the economy during the last decade saw many people looking for other job opportunities. A lot of them went back to rural areas to pursue herding during the beginning of 1990s. Others, especially recently, have returned or migrated to the cities and aimag centers. For instance, according to the household survey almost ten percent of the population can be considered as migrants[37]. Half of them migrated in the last ten years and a quarter since 1998. Four out of ten migrants reported that they moved because of work or to live close to the market. What is the observed connection between poverty and migration?

Twelve percent of Mongolians live in a household whose head is an immigrant. They experience less poverty than those the rest of the population, 31% and 37% respectively (Table 2.12). Although this finding is significant at the national level, it is not when the comparison is done within urban areas. In both domains, families with a head that migrated are better-off than those with a head born in the same soum, but the differences are lower. Immigrants are concentrated in urban areas, almost four fifths of the population with an immigrant head are in the capital and in aimag centers. A tenth of the poor lives in households headed by an immigrant, and seventy percent of them are in urban areas. Finally, no major distinctions are found when looking at demographic indicators, except that rural immigrant heads are older and more likely to be female.

Table 2.12: Poverty and migratory status of the household head

	National		Urban		Rural	
	Migrant	Non-migrant	Migrant	Non-migrant	Migrant	Non-migrant
Headcount	31.2	36.8	29.0	30.5	38.7	43.7
	(2.9)	(1.5)	(3.2)	(1.9)	(5.9)	(2.4)
Poverty Gap	9.6	11.2	8.4	9.4	13.9	13.2
	(1.2)	(0.6)	(1.3)	(0.8)	(2.8)	(1.0)
Severity	4.4	4.7	3.8	4.0	6.6	5.5
	(0.7)	(0.4)	(0.8)	(0.4)	(1.5)	(0.6)
Memorandum items:						
Household size	4.2	4.3	4.3	4.4	4.1	4.3
Dependency ratio (%)	43.8	43.3	42.9	41.6	47.1	45.0
Children (% household size)	29.9	31.4	29.4	29.7	31.8	33.1
Age of household head	47.2	44.1	47.6	45.9	45.9	42.1
Male household head (%)	79.7	82.9	78.8	79.7	82.6	86.3
Share below PL (%)	10.6	89.4	16.5	83.5	5.5	94.5
Population share	12.3	87.7	9.6	45.9	2.7	41.8

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

[37] The definition considers population born in a different soum in which they are currently living and people that originally emigrated from their soum of birth but returned to live in there. Using a similar definition, but with aimags as the space of reference instead of soums, the 2000 Census estimated a considerably higher figure of about 25%.

2.8. Assets

Ownership of assets is an essential factor to determine the living standards of the population. It allows households to hedge against economic insecurity or seasonal patterns in agriculture. If the main breadwinner is suddenly unemployed or if a natural disaster occurs, such as heavy snowstorms, droughts or floods, the household can use its assets to smooth their consumption. For instance, livestock can be slaughtered or money taken out from savings. Assets are generally crucial to access credit markets. Hence this wealth indicator works as insurance to avoid vulnerability. Three types of household assets will be examined: livestock, land and financial assets.

Livestock

Livestock is the main factor of production in agriculture in Mongolia. Almost half of the labor force engages in agriculture, mainly herding and related activities. Livestock rearing involves mainly five types of animals in the country, each one reflecting different opportunities for the household, having goats implies been involved in the cashmere business, owning sheep or camels is related to the wool commerce, and cattle and horses are associated with meat, milk and dairy production.

Table 2.13 shows livestock holdings for the main five species and by various geographical divisions. Almost four out of ten people hold animals. Cattle, horses, goats and sheep are held by around one fourth to one third of the population, whereas camels are only brought up by less than one tenth. Patterns vary by region, less than 10% of urban dwellers owns animals compared with almost three quarters in rural areas. Ulaanbaatar is the domain where ownership of animals is lowest, not even four percent. By contrast, in the countryside close to ninety percent of the population holds some type of animals. A more even pattern is observed when looking at the west-east divide, with the Highland as the region where holdings are higher, especially for sheep and goats.

The average livestock per capita among herders is 7 *bods*, or an equivalent of 7 horses[38] (see also Table 2.13). Not surprisingly, rural areas have more than double the levels of urban domains. Among analytical domains, the more rural is the area, the higher are the average holdings. Across regions, it is the East the one that consistently has a higher livestock per capita for almost all species (the exception being camels). The fact that most of its territory consists of vast steppes and grasslands, a critical element for herding, favors these activities in that region. On the other hand, the West is a domain where ownership is well spread, ranks second after the Highland, but livestock per herder is the lowest. Finally, more poor people are involved in rearing animals but their average livestock held is less than half that of the non-poor. This pattern is similar for all species of livestock.

[38] The purpose of the *bod* scale is to calculate the size of the herd by transforming all livestock held into equivalent horses. One horse is assumed to be the same as one cattle (cow or yak), 0.67 camels, six sheep or eight goats.

Table 2.13: Livestock holdings

	Cattle		Horses		Camels		Sheep		Goats		Bods	
	Holders (%)	Average among holders	Holders (%)	Average among holders	Holders (%)	Average among holders	Holders (%)	Average among holders	Holders (%)	Average among holders	Holders (%)	Average among holders
Urban	7.2	1.9	3.3	2.4	0.3	0.7	4.1	8.2	4.7	4.5	9.1	3.3
Rural	54.5	2.3	57.5	2.9	17.4	1.1	61.7	12.4	64.0	12.5	72.3	7.6
Ulaanbaatar	3.2	1.2	1.1	4.0	0.1	1.0	1.1	5.8	1.0	3.4	3.8	2.6
Aimag centers	11.9	2.1	5.9	2.0	0.7	0.6	7.7	8.6	9.2	4.6	15.4	3.5
Soum centers	39.0	1.7	29.3	2.3	4.4	0.5	34.0	7.9	36.4	7.1	46.9	4.5
Countryside	63.4	2.6	73.6	3.0	24.7	1.1	77.5	13.5	79.8	13.9	86.7	8.5
West	40.2	1.6	41.9	1.4	15.3	0.5	43.5	8.7	49.9	12.4	54.4	5.0
Highland	42.5	2.6	45.2	2.9	8.1	1.4	52.1	10.7	50.4	11.7	58.3	7.3
Central a/	28.5	1.5	24.1	3.3	9.7	1.8	30.7	14.2	31.2	11.3	40.1	6.6
East	50.8	3.7	47.5	4.5	15.9	0.6	38.2	20.9	45.2	12.5	53.8	11.5
Non-poor	28.3	2.7	27.1	3.7	7.8	1.4	29.1	15.6	30.0	13.6	35.7	9.0
Poor	28.3	1.4	27.9	1.4	8.1	0.5	30.9	6.1	33.3	9.0	39.9	3.9
National	28.3	2.3	27.4	2.9	7.9	1.0	29.8	12.1	31.2	11.8	37.2	7.0

a/ Excludes Ulaanbaatar.

Note: The bod scale was used to estimate the size of the herd. These factors transform cattle, camels, sheep and goats into equivalent horses. One horse is assumed to have the same value as one cattle, 0.67 camels, six sheep or eight goats. Cattle includes cows and yaks.

Source: 2002/03 HIES/LSMS.

What is the connection between livestock holdings and living standards? Table 2.14 compares poverty measures by urban-rural divide and by whether or not the household keeps livestock. The evidence seems to suggest that the impact of rearing livestock is very different in those two domains. In urban areas it is linked with a higher level of poverty, probably reflecting the fact that in cities reliance on agriculture activities is not enough, households must diversify in order to improve their livelihood. However, in rural areas, owning livestock does increase the welfare level of the population, the incidence of poverty is significantly lower for the population that engages in livestock activities and their gap and severity of poverty indexes are even proportionally smaller when compared to population without livestock. Across regions, it is in the East and Central where herders enjoy higher living standards than non-herders, but only in the East the level of poverty is considerably lower among the population involved in herding. In the West the incidence of poverty appears to be lower among non-herders, whereas in the Highland is about the same across both groups.

Table 2.14: Poverty and livestock holdings

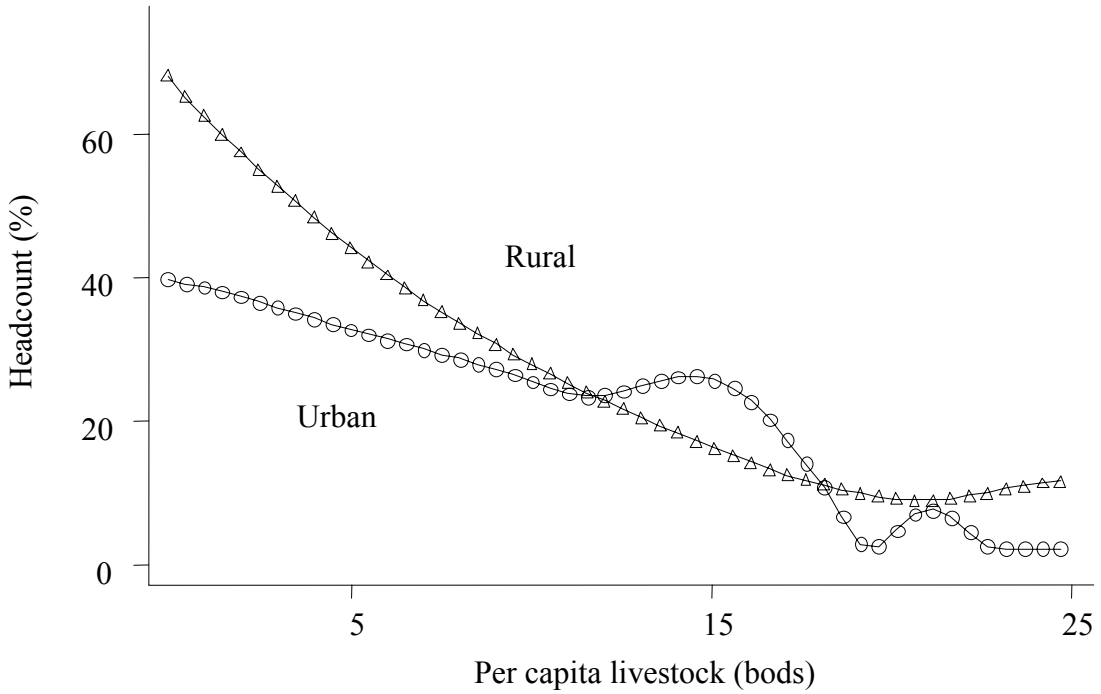
	National		Urban		Rural	
	Non-herders	Herders	Non-herders	Herders	Non-herders	Herders
Headcount	34.6	38.7	29.9	33.7	53.5	39.5
	(1.6)	(2.6)	(1.8)	(5.1)	(3.2)	(2.9)
Poverty Gap	10.9	11.2	9.2	8.9	17.5	11.6
	(0.7)	(1.0)	(0.7)	(2.3)	(1.7)	(1.1)
Severity	4.8	4.5	4.0	3.5	8.0	4.6
	(0.4)	(0.5)	(0.4)	(1.2)	(1.1)	(0.6)
Memorandum items:						
Household size	4.3	4.3	4.3	4.7	4.2	4.3
Dependency ratio (%)	42.6	44.6	41.6	44.5	46.5	44.6
Children (% household size)	30.8	31.8	29.7	29.4	35.4	32.1
Age of household head	45.3	43.0	46.0	48.8	42.8	42.2
Male household head (%)	79.4	87.8	78.9	87.0	81.4	87.9
Share below PL (%)	60.1	39.9	41.8	4.7	18.3	35.2
Population share	62.8	37.2	50.4	5.0	12.4	32.2

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

This result implies that, at least in rural areas, there is a negative link between poverty and livestock holdings. Does the number of livestock held matter? Figure 2.6 displays the incidence of poverty relative to the level of per capita livestock among herders. It is found that indeed poverty declines with a higher number of per capita livestock in both urban and rural domains. Although in urban areas, the share of population owning livestock is worse-off compared to those that do not, among owners, the more livestock they hold, the less poverty they experience. The relationship is clearer in rural areas, yet for holdings greater than twenty *bods* per capita, poverty appears to be stable. A possible explanation is that the more animals the household own, the more productive activities it can engage, so, by diversifying, the household minimizes its exposure to negative shocks that may hit them harder if they relied only in one particular activity. The fact that 75% of herders owns at least three of the main five types of animals provides support to this hypothesis[39].

[39] The other case would be if households focus in only one or two livestock activities, which may allow them to specialize and reach some economies of scale in the production process.

Figure 2.6: Poverty and size of herd



Source: 2002/03 HIES/LSMS.

Land

Land is typically recognized as one of the most important assets of households, particularly in agricultural economies. However in Mongolia farming is limited and it is of limited relevance when compared with herding activities. According to the household survey, only 13% of the population uses land for growing crops, with no major differences in urban or rural areas. Furthermore, being engaged in farming appears to reduce the chances of having higher living standards in both domains. The poor are more likely to be involved in agriculture than the non-poor, 17% and 11% respectively. A few factors may help to explain why agriculture is not developed in the country. First, exposure to weather conditions makes farming difficult, production can be easily lost due to weather hazards. Second, productivity is affected by the quality of the soil and the low share of irrigated land. Third, more investment may be required for farming than, say, for herding, both in terms of labor and capital. Fourth, it is not a traditional activity performed by households, just until a few years ago the state used to run farms in the country. Fifth, farming is harder to reconcile with the movements involved in the long-established way of breeding livestock.

Table 2.15: Poverty and land access

	National		Urban		Rural	
	Non-farmers	Farmers	Non-farmers	Farmers	Non-farmers	Farmers
Headcount	34.5	47.2	29.2	39.0	41.4	54.3
	(1.5)	(3.2)	(1.8)	(4.4)	(2.5)	(4.4)
Poverty Gap	10.3	15.4	8.8	12.6	12.4	17.7
	(0.6)	(1.5)	(0.7)	(1.8)	(1.0)	(2.3)
Severity	4.4	6.8	3.8	5.5	5.1	7.9
	(0.3)	(0.9)	(0.4)	(1.1)	(0.5)	(1.5)
Memorandum items:						
Household size	4.2	4.8	4.3	4.9	4.2	4.8
Dependency ratio (%)	43.4	43.1	41.6	43.7	45.6	42.6
Children (% household size)	30.8	33.9	29.5	30.8	32.5	36.5
Age of household head	44.4	45.2	45.9	49.0	42.4	41.9
Male household head (%)	81.9	87.8	78.9	86.0	85.6	89.2
Share below PL (%)	83.2	16.8	40.1	6.4	43.1	10.4
Population share	87.2	12.8	49.5	5.9	37.6	6.9

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Financial assets

A significant component of household wealth is generally made of financial assets. If income exceeds expenditure, people can accumulate savings, but if they are more concerned with daily survival, this is unlikely to happen. In Mongolia, only one tenth of the population lives in households that have financial assets in the form of either bank accounts or stocks in companies[40]. In urban areas the share is 15% compared to barely 7% in rural domains. This may reflect however the low degree of financial intermediation in the country and it could be argued that people save by holding cash, something that is not captured in the survey. Yet more than 90% of non-savers responded that they did not save because they do not have enough money to do so. Moreover, it is evident that having financial assets is strongly correlated with low poverty levels, particularly in Ulaanbaatar and aimag centers, where the poverty incidence among savers is one third that among non-savers (Table 2.16). In soum centers and the countryside, the poverty headcount among savers is forty percent less than among non-savers. The pattern is even more clear-cut when comparing the other two poverty measures. Lastly, 5% of the poor own financial assets compared to 15% of the non-poor.

[40] When state owned companies were privatized, shares were given away or sold to the population.

Table 2.16: Poverty and savings

	National		Urban		Rural	
	Non-savers	Savers	Non-savers	Savers	Non-savers	Savers
Headcount	38.8	15.5	33.8	11.1	44.6	27.5
	(1.5)	(2.4)	(1.8)	(2.4)	(2.4)	(5.9)
Poverty Gap	12.0	3.1	10.5	2.0	13.7	6.1
	(0.6)	(0.6)	(0.8)	(0.5)	(1.0)	(1.5)
Severity	5.2	0.9	4.6	0.5	5.8	2.0
	(0.4)	(0.2)	(0.5)	(0.2)	(0.6)	(0.7)
Memorandum items:						
Household size	4.3	4.3	4.4	4.3	4.2	4.4
Dependency ratio (%)	43.5	42.1	42.1	40.1	45.0	47.6
Children (% household size)	31.1	32.1	29.5	30.3	32.7	37.1
Age of household head	44.5	44.5	46.5	44.7	42.2	44.2
Male household head (%)	82.0	86.5	78.6	85.1	85.8	90.4
Share below PL (%)	95.0	5.0	43.8	2.6	51.2	2.4
Population share	88.3	11.7	46.9	8.6	41.5	3.1

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

2.9. Housing

Another key determinant of living standards for the population is the type of housing they occupy and the access to basic infrastructure services. Households can quickly improve their welfare if they are provided with a better dwelling or with services that make them less vulnerable and expand their options and opportunities. A proper infrastructure will lift some of the constraints they face to increase their productivity, for example, it could make a big difference if instead of fetching water from a place half an hour away from the dwelling, household members could obtain water from an improved source, say a public standpipe, located closer to the dwelling, or even better, if they could be connected to the water network. Two aspects of housing will be examined, type of dwellings and access to basic services.

Dwelling

Gers are the most common type of housing in Mongolia, 45% of dwellers live there, a third in houses and a fifth in apartments. This varies by regions, in urban areas almost half of the population lives in houses, a third in apartments and only a fifth in gers, whereas in rural domains three quarters of the people live in gers and the remaining mainly in houses. Table 2.17 displays the relationship between poverty and type of dwellings. The incidence of poverty is higher in gers, lower in houses and the least in apartments. The same trend is observed in urban areas, the chances of being poor living in an apartment are less than half of those living in houses and a third of those occupying gers. But in rural domains another pattern emerges: the level of poverty is higher in houses than in gers. The poor are more likely to live in a ger, more than half of them do, a third in houses and barely one tenth in apartments. In Ulaanbaatar and aimag centers

though half of the poor lives in houses, a third in gers and a sixth in apartments. In rural domains the distribution of the poor follows the distribution of the population, three out of four live in gers and the remaining in houses.

Table 2.17: Poverty and type of dwelling

	National				Urban				Rural			
	Ger	House	Apartment	Others	Ger	House	Apartment	Others	Ger	House	Apartment	Others
Headcount	43.4	38.2	16.6	30.0	47.5	33.9	14.3	31.2	41.9	48.5	41.8	20.0
	(2.2)	(1.9)	(2.3)	(6.7)	(3.2)	(2.2)	(2.1)	(7.1)	(2.7)	(3.7)	(10.4)	(18.4)
Poverty Gap	13.5	11.3	5.0	9.1	14.7	10.5	3.9	9.6	13.0	13.3	16.8	4.6
	(0.9)	(0.9)	(1.1)	(2.5)	(1.4)	(1.0)	(0.7)	(2.7)	(1.1)	(1.5)	(8.0)	(4.2)
Severity	5.7	4.8	2.3	3.2	6.2	4.7	1.6	3.5	5.5	5.2	9.2	1.0
	(0.5)	(0.5)	(0.7)	(1.3)	(0.8)	(0.6)	(0.4)	(1.5)	(0.6)	(0.8)	(5.3)	(1.0)
Memorandum items:												
Household size	4.2	4.6	4.0	4.5	4.5	4.7	4.0	4.6	4.1	4.6	4.7	4.2
Dependency ratio (%)	45.7	42.1	40.3	40.4	45.7	41.1	40.5	40.7	45.8	44.3	37.2	38.3
Children (% household size)	31.9	32.3	28.0	30.5	31.0	30.8	27.5	29.5	32.2	35.7	34.1	38.3
Age of household head	43.5	44.6	46.1	48.4	47.3	45.4	46.5	49.7	42.3	42.8	40.8	38.6
Male household head (%)	84.0	82.4	79.6	82.4	77.6	81.1	78.8	82.0	86.0	85.5	91.0	85.9
Share below PL (%)	53.1	37.1	9.2	0.7	15.3	23.3	7.3	0.7	37.8	13.8	1.9	0.1
Population share	44.2	35.1	19.9	0.9	11.6	24.8	18.3	0.8	32.6	10.3	1.7	0.1

Note: Others include public and students dormitories, and other public apartments. Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Infrastructure services

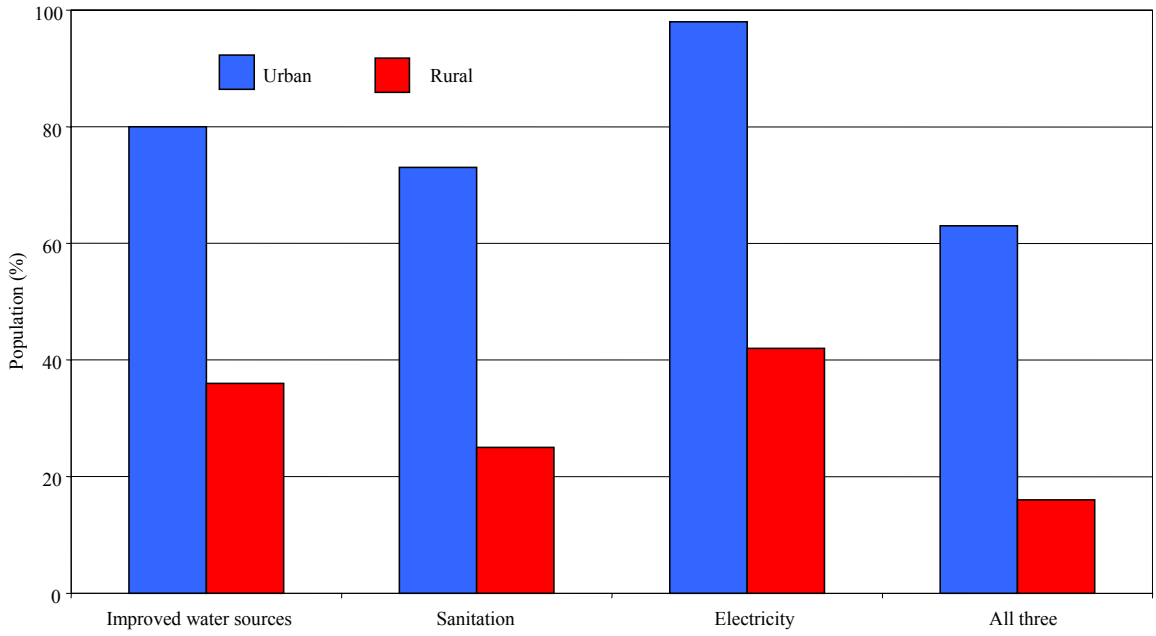
Living standards are increased by adequate infrastructure services such as access to an improved source of water, proper sanitation facilities or electricity[41]. Lack of safe water or basic sanitation affects the health of the population by increasing the chances of illnesses that are quickly transmitted in those environments. Lack of electricity has a direct effect on education and investment prospects. How does Mongolia fare in these dimensions of welfare?

The household survey indicates that three fifths of the country have access to improved sources of water, half to improved sanitation facilities, three quarters to electricity, and four out of ten individuals to all of them. However, there is a considerable urban bias. Figure 2.7 shows that the availability of these services in urban areas is far more established than in rural regions. At least three quarters of urban dwellers have access to each one of them compared to a quarter of the rural population. Even more significant is the comparison among those receiving all of the three basic services, 63 percent in urban areas and only 16 percent in rural regions. Another factor -not fully captured in the survey- is the quality of the services. Urban areas generally have access to better services than rural areas. For instance, tap water may be regarded as of better quality than water

[41] Access to an improved water source refers to the percentage of the population with household connection, public standpipe or protected well or spring. Unimproved sources include vendors, tanker trucks and unprotected wells and springs. Sanitation refers to the percentage of the population with access to improved sanitation facilities such as adequate excreta disposal facilities (private or shared but not public). They can range from simple but protected pit latrines to flush toilets with a sewerage connection.

coming from a well, which, even when is protected, could be more exposed to contamination.

Figure 2.7: Access to infrastructure services in urban and rural areas



Source: 2002/03 HIES/LSMS.

Table 2.18 displays the association between the level of poverty and access to basic infrastructure services. Nationwide, population lacking appropriate water, sanitation or electricity is poorer than those with access to them. The contrast is more evident when comparing access to all of the three basic services, only one quarter of the population receiving them is poor compared with more than two fifths among those who do not. Table 2.19 provides the poverty measures by an urban-rural divide. The picture varies substantially depending on what area one is looking at. In urban areas the incidence of poverty is considerably lower among those receiving any service or all of them than among urban dwellers lacking access to infrastructure services. By contrast, in rural regions findings are a bit puzzling. The incidence of poverty is higher among those obtaining any of the services, although the joint access to the three of them does seem correlated to higher living standards yet the difference is not large enough to be regarded as statistically significant.

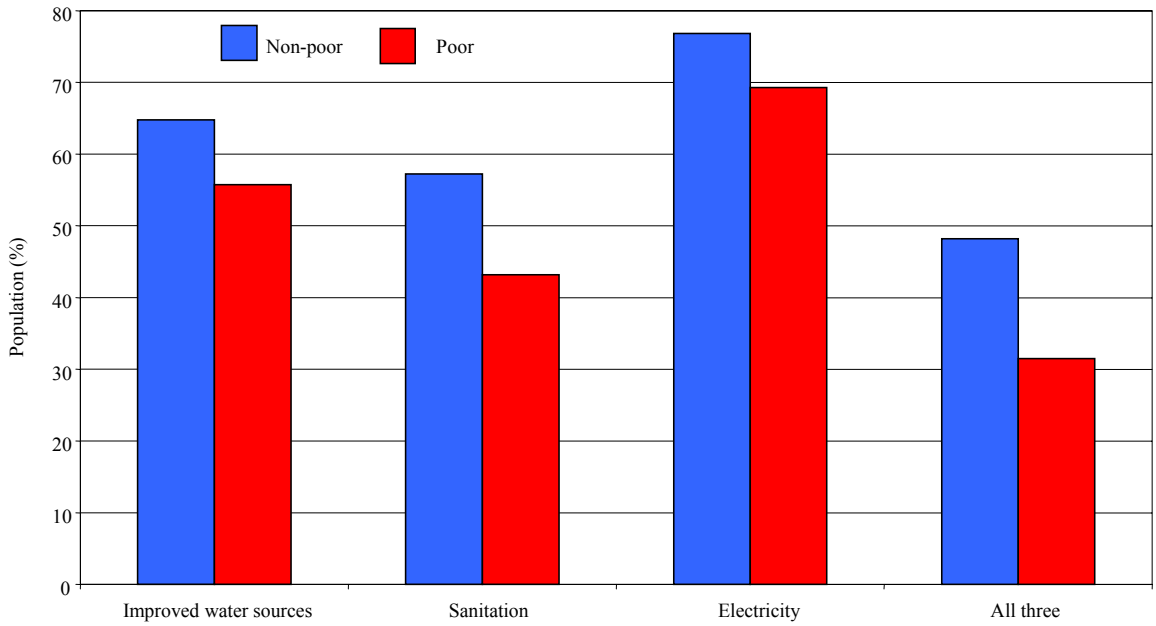
Table 2.18: Poverty and infrastructure services

	Improved water sources a/		Sanitation b/		Electricity		All three	
	Yes	No	Yes	No	Yes	No	Yes	No
Headcount	33.0	40.9	30.2	42.5	34.0	41.8	26.9	42.8
	(1.6)	(2.4)	(1.7)	(2.1)	(1.5)	(3.2)	(1.8)	(1.9)
Poverty Gap	9.9	12.7	9.0	13.1	10.3	12.8	7.9	13.2
	(0.7)	(1.0)	(0.7)	(0.9)	(0.6)	(1.3)	(0.7)	(0.8)
Severity	4.2	5.4	3.8	5.6	4.4	5.5	3.3	5.7
	(0.4)	(0.6)	(0.4)	(0.5)	(0.3)	(0.7)	(0.4)	(0.5)
Memorandum items:								
Household size	4.3	4.3	4.3	4.3	4.4	4.1	4.3	4.3
Dependency ratio (%)	42.6	44.4	41.6	45.1	42.4	45.8	41.3	44.8
Children (% household size)	30.8	31.7	29.6	32.8	30.8	32.1	29.0	32.8
Age of household head	45.3	43.2	45.8	43.0	45.4	42.0	46.2	43.2
Male household head (%)	80.7	85.4	81.6	83.6	81.3	85.7	81.5	83.3
Share below PL (%)	55.8	44.2	43.5	56.5	68.9	31.1	31.3	68.7
Population share	61.0	39.0	52.0	48.0	73.1	26.9	42.0	58.0

a/ It refers to the percentage of the population with access to an improved water source such as household connection, public standpipe or protected well or spring. Unimproved sources include vendors, tanker trucks and unprotected wells and springs.
b/ Sanitation refers to the percentage of the population with access to improved sanitation facilities such as adequate excreta disposal facilities (private or shared but not public). They can range from simple but protected pit latrines to flush toilets with sewerage connection.
Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Figure 2.8 shows the availability of infrastructure services by poverty status of the population. The non-poor have better access to improved water sources, sanitation facilities and electricity than the poor, and the gap is substantial when considering joint access. Again, the national picture disguises regional patterns. Whereas in urban areas a larger share of the non-poor receives these services, in rural domains access is similar for both groups.

Figure 2.8: Access to infrastructure services by poverty status



Source: 2002/03 HIES/LSMS.

Table 2.19: Access to infrastructure services by urban-rural divide

	Improved water sources a/				Sanitation b/				Electricity				All three			
	Urban		Rural		Urban		Rural		Urban		Rural		Urban		Rural	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Headcount	28.3	38.8	46.3	41.7	26.0	41.9	45.0	42.8	29.6	63.5	46.7	41.0	24.0	41.0	41.4	43.8
	(1.9)	(3.3)	(3.1)	(3.0)	(1.9)	(2.8)	(3.3)	(2.7)	(1.7)	(8.8)	(2.7)	(3.3)	(2.0)	(2.4)	(3.8)	(2.7)
Poverty Gap	8.6	11.9	13.7	13.0	7.7	13.4	13.9	13.0	8.8	29.9	14.7	12.1	7.0	13.0	12.3	13.4
	(0.7)	(1.5)	(1.3)	(1.3)	(0.7)	(1.3)	(1.6)	(1.1)	(0.7)	(7.3)	(1.4)	(1.3)	(0.7)	(1.2)	(1.7)	(1.1)
Severity	3.7	5.2	5.8	5.4	3.2	6.1	6.2	5.3	3.7	18.8	6.3	5.0	2.9	5.8	5.3	5.6
	(0.4)	(0.9)	(0.7)	(0.7)	(0.4)	(0.8)	(0.9)	(0.6)	(0.3)	(6.0)	(0.8)	(0.7)	(0.4)	(0.7)	(0.9)	(0.6)
Memorandum items:																
Household size	4.3	4.6	4.3	4.2	4.3	4.6	4.5	4.2	4.4	4.5	4.4	4.1	4.2	4.6	4.4	4.2
Dependency ratio (%)	41.6	42.9	45.6	44.9	41.4	43.1	42.6	46.0	41.6	53.6	44.7	45.5	41.2	43.0	42.1	45.7
Children (% household size)	29.4	30.8	34.7	32.1	28.6	32.7	33.4	32.9	29.6	32.2	34.3	32.1	28.2	32.4	33.0	33.0
Age of household head	46.3	45.7	42.4	42.3	46.7	44.7	42.5	42.3	46.2	47.2	43.2	41.8	46.9	44.9	42.8	42.3
Male household head (%)	79.2	81.2	84.8	86.8	80.3	77.6	86.4	86.0	79.9	62.1	85.5	86.5	80.5	77.9	86.8	86.0
Share below PL (%)	35.1	11.3	20.7	32.9	29.3	17.2	14.2	39.3	44.7	1.8	24.2	29.4	23.3	23.2	8.0	45.5
Population share	44.9	10.5	16.1	28.4	40.6	14.8	11.4	33.2	54.4	1.0	18.7	25.9	35.0	20.4	7.0	37.6

a/ It refers to the percentage of the population with access to an improved water source such as household connection, public standpipe or protected well or spring.
Unimproved sources include vendors, tanker trucks and unprotected wells and springs.
b/ Sanitation refers to the percentage of the population with access to improved sanitation facilities such as adequate excreta disposal facilities (private or shared but not public).
They can range from simple but protected pit latrines to flush toilets with a sewerage connection.
Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

3. SOCIAL SECTORS, LABOR MARKET AND SAFETY NETS

A major constraint that the poor face to escape poverty is their low levels of human capital. Investing in education and health is a significant step towards improving the living standards of the poor. International experience has shown that it boosts the productivity of labor, which is typically the main and sole asset they own. It also provides the means to the poor and their children to lead better lives. A second limitation the poor confront is the scarce assistance they obtained from public and private sources to help them cope with economic insecurity. Safety networks often play an important role in mitigating adverse shocks the household face and in alleviating poverty. This chapter focuses first on the education and health sectors, it examines if the provision of these services is equitable and the differences in endowments between the poor and the non-poor. Then it evaluates the main features of the labor market such as participation rates, characteristics of employment and unemployment rates. Lastly, it analyzes the extent and importance of safety nets, both formal and informal, and their effect on the living standards of the population.

3.1. Education

This section reviews the evidence for the education sector in the country. It examines the extent and the degree of inequality in terms of access to schools and education endowments. It starts by looking at the educational attainment of the adult population and then focusing on those currently attending school. Enrollment is examined through net and gross enrollment rates as well as participation rates, and later a students' profile is developed.

Adult educational attainment

The adult population in Mongolia has reached a very high educational attainment[42]. According to the household survey, more than 80% of the population 18 years and older has at least finished the 8th grade of secondary, almost a tenth vocational educational and more than a fifth tertiary education (see Table 3.1, and also Table D.15 in Appendix D). Only one of every twenty adults has not completed primary school and around one tenth has only completed primary. Urban adults have higher levels than rural residents. For instance, four out of ten urban dwellers have finished studies beyond secondary school, i.e. either vocational or tertiary education, compared to less than one fifth rural residents. By contrast, less than one tenth of urban adults have none or primary education, whereas this share is three times higher in rural areas.

Across analytical domains, the capital presents the highest attainments, followed by aimag centers, soum centers and lagging further behind the countryside. In the four domains, around half of the population has finished either 8th grade of secondary or completed secondary. However, differences are clearer both at the low and top end of education levels. Between three and four tenths of adults have attained education levels beyond secondary school in urban areas and soum centers, while in the countryside this percentage plummets to one tenth. The opposite finding is found at lower levels: almost

[42] Adult population refers to the population 18 years old and more. Less than 10% of them are still attending educational institutions.

40 percent of adults in the countryside have no more than primary education but in the rest of the country this share stands at around 10 percent. This accounts for the fact that the only unambiguous feature of those with low levels of education is that they are overwhelmingly rural dwellers. Around seven out of ten are rural dwellers and more than 80 percent of them are from the countryside.

A division of the population based on consumption quintiles illustrates an evident pattern[43]. The better-off the individual in terms of consumption, the higher its educational attainments. Almost one out of five adults from the poorest quintile completes no more than primary school compared to half that share among the wealthiest. On the other hand, almost half of the richest adults have more than a secondary degree but less than a fifth of the poorest have achieved the same. Within each educational level, the distribution by quintile, up to vocational degrees, is relatively uniform, with each quintile contributing around one fifth. However, for tertiary education that is no longer the case. More than a third of those with a higher diploma come from the richest quintile compared to less than one tenth from the lowest. Among those with university degrees, the gap is even wider, almost fifty percent come from the richest group and less than 5% from the poorest quintile.

Table 3.1: Highest educational attainment of adult population

	None	Primary	Secondary 8th grade	Complete Secondary	Vocational	Higher diploma	University	Total
Location								
Urban	2.2	6.8	18.6	31.3	9.4	16.3	15.4	100.0
Rural	9.0	19.1	32.9	20.8	7.7	7.3	3.2	100.0
Ulaanbaatar	2.0	6.4	17.2	31.3	8.5	16.7	17.9	100.0
Aimag centers	2.5	7.2	20.4	31.4	10.6	15.7	12.2	100.0
Soum centers	3.0	9.0	26.6	29.3	12.3	13.4	6.5	100.0
Countryside	12.3	24.8	36.5	16.0	5.2	3.9	1.3	100.0
West	7.7	15.6	26.3	23.7	10.0	10.8	6.0	100.0
Highland	8.1	14.4	30.9	24.2	5.7	10.7	6.1	100.0
Central a/	3.4	14.5	25.9	26.9	11.5	9.6	8.2	100.0
East	7.6	14.0	30.2	23.3	9.0	11.0	4.9	100.0
Gender								
Men	4.9	11.8	29.2	24.9	8.8	10.4	9.9	100.0
Women	5.2	12.1	20.6	28.6	8.7	14.3	10.6	100.0
Quintile								
Poorest	6.8	15.5	36.5	23.4	9.4	6.6	1.9	100.0
Q2	6.0	13.0	30.3	27.8	9.1	9.8	4.1	100.0
Q3	5.0	12.5	24.7	29.2	8.7	11.9	7.9	100.0
Q4	4.4	10.5	19.8	28.8	9.2	14.1	13.2	100.0
Richest	3.8	9.7	16.2	24.9	7.6	17.7	20.1	100.0
National	5.1	12.0	24.7	26.9	8.7	12.5	10.2	100.0

a/ Excludes Ulaanbaatar.
Source: 2002/03 HIES/LSMS.

What is the link between poverty status and education levels? The poor display lower educational attainments than the non-poor. More than half of the poor only reach the 8th

[43] Quintiles are defined in terms of per capita consumption, at the national level and on a population basis. Thus each quintile comprises twenty percent of the population.

grade of secondary compared to one third of the non-poor. Around 10% of the poor complete tertiary education, while almost three out of ten non-poor achieve the same feat. These patterns are similar in urban areas but they are more even in rural regions (see Table 3.2). For example, three out of five rural dwellers complete only up to the 8th grade of secondary, regardless of their poverty status, and the share of non-poor with tertiary education is less than double that of the poor.

Table 3.2: Highest education level of adult population by poverty and urban-rural divide

	Urban		Rural		National	
	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor
None	1.7	3.5	8.9	9.2	4.5	6.4
Primary	5.6	10.0	19.0	19.3	10.7	14.7
Secondary 8th grade	13.7	32.2	31.6	35.1	20.6	33.7
Complete secondary	31.8	30.0	20.9	20.7	27.6	25.3
Vocational	9.1	10.5	7.2	8.7	8.3	9.6
Higher diploma	18.7	9.7	8.3	5.6	14.7	7.6
University	19.5	4.1	4.2	1.5	13.6	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: 2002/03 HIES/LSMS.

The gender dimension shows that women have higher education levels than men. The disparity starts to build up at early stages i.e. whereas three out of ten men stop at the 8th grade of secondary, only one fifth of women do so. Women are more likely to finish a tertiary degree and this result is partially driven by a slightly higher female completion in higher education institutions than in universities. Three out of five adults with a diploma are female compared to five out of nine women in universities. Table 3.3 introduces the poverty element to this comparison. Still non-poor women have better educational levels than non-poor men. Among the poor, both men and women display similar levels, although women are more likely to finish secondary and tertiary education.

Table 3.3: Highest education level of adult population by poverty and gender

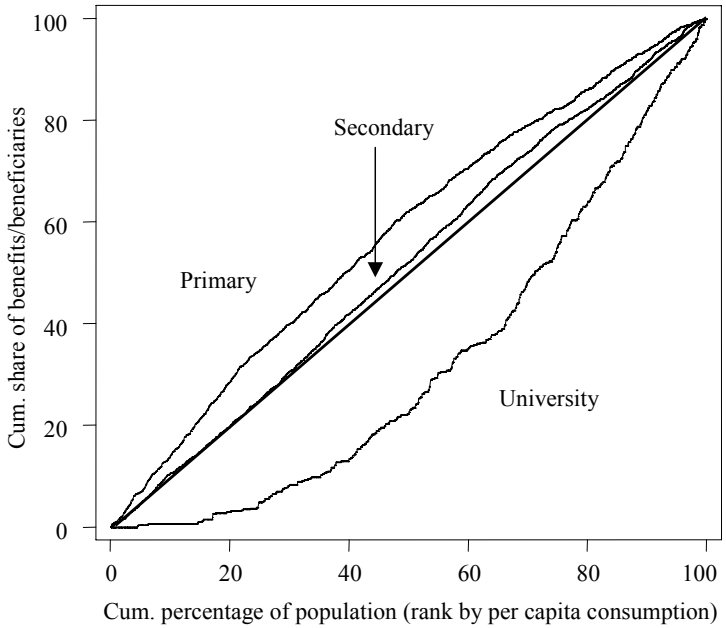
	Men		Women	
	Non-poor	Poor	Non-poor	Poor
None	4.0	6.9	4.9	5.9
Primary	10.6	14.5	10.8	14.9
Secondary 8th grade	24.8	39.0	16.8	28.9
Complete secondary	26.9	20.6	28.2	29.5
Vocational	8.2	10.1	8.5	9.1
Higher diploma	12.5	5.9	16.7	9.2
University	13.0	3.0	14.2	2.5
Total	100.0	100.0	100.0	100.0

Source: 2002/03 HIES/LSMS.

Public spending

Mongolia devotes around 9% of its Gross Domestic Product to the education sector. What is the pattern of this spending across different levels? Figure 3.1 plots the cumulative percentage of beneficiaries from public education against the cumulative share of the population ranked by per capita consumption. This analysis requires information on unit costs and frequency of service for each level of education. Unit costs are assumed to be constant within each level, thus the distribution of beneficiaries is identical to the distribution of public spending in the respective level[44]. The incidence of public spending is very different in each level of schooling, in primary spending is progressive, in secondary is largely neutral and in tertiary education is highly regressive. This pattern is a reflection of the lower attendance of the poor to higher education levels. While the poor are more likely to benefit from primary education than the non-poor, their chances become even at the secondary and significantly lower at tertiary levels[45]. The assessment along urban and rural areas favors the latter. Primary and secondary in rural regions is highly pro-poor whereas in urban areas is neutral. Tertiary education is regressive in rural areas but less than in urban ones[46].

Figure 3.1: Public spending in primary, secondary and university



Source: 2002/03 HIES/LSMS.

[44] The overall pattern of spending in education is not plotted because of the lack of disaggregated information on expenditures for primary, secondary and university.

[45] A further breakdown of secondary into lower (covering the first 4 years) and upper (the last 2) reveals no major differences across these two levels.

[46] Figures showing these findings can be found in Appendix D.

Net and gross enrollment rates

A standard approach to measure the access and efficiency of the educational system is with enrollment rates[47,48]. Table 3.4 shows both rates along a number of students' characteristics. In primary school, the net enrollment rate is almost 90%. No major differences are found across urban and rural areas, gender or consumption quintiles[49]. Across regions, only the countryside appears with a relatively low rate. Overall then, attendance to primary at the right age does not seem to be a concern. But the gross enrollment rate stands at 109%. This signals that a significant share of students attending primary are over-aged, which is likely to reflect mainly a late entrance to school. In general, the further apart are these two rates, the more serious is the problem of over-aged students[50].

Enrollment rates in secondary school reveal another situation. First, they are much lower than in primary, suggesting that attendance to secondary school at any age is not as common as in primary. Second, gross and net rates are less far apart than in primary. This indicates that a smaller proportion of over-aged students attend secondary and that only children that started primary at the correct age continue for further education. Third, both rates differ a lot across different characteristics of the students. For instance, enrollment is significantly higher in urban areas and among children from the richest quintile compared to rural regions and children from the poorest quintile respectively.

Table 3.4: Net and gross enrollment rates

[47] Net enrollment rate is defined as the ratio of the number of children of official school age who are enrolled in school to the population of the corresponding official school age. Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Two levels of education are considered: primary (ages 8 to 11) and secondary (ages 12 to 17).

[48] Table D.16 in Appendix D shows a comparison between the enrollment rates calculated from the household survey and the official figures.

[49] There might be differences in the quality of education, but it is not possible to perform such analysis with the available data.

[50] It can also reflect high repetition rates.

	Net enrollment rates		Gross enrollment rates	
	Primary (8-11)	Secondary (12-17)	Primary (8-11)	Secondary (12-17)
Location				
Urban	89	83	110	91
Rural	88	64	109	68
Ulaanbaatar	87	82	111	90
Aimag centers	91	85	109	93
Soum centers	93	76	116	81
Countryside	84	54	105	58
Gender				
Men	89	72	108	79
Women	88	78	111	84
Quintile				
Poorest	89	65	108	70
Q2	87	70	117	78
Q3	92	78	113	84
Q4	86	82	100	89
Richest	88	85	106	93
National	89	75	109	82

Source: 2002/03 HIES/LSMS.

Enrollment rates by poverty status and urban-rural divide are shown in Table 3.5. Net rates for primary school in urban areas are the same regardless of living standards but in rural areas they slightly favor the non-poor. Gross rates vary especially in urban areas, where the difference is significant across the poverty levels. Hence, although poor and non-poor have similar access to primary, the poor are less likely to attend this level at the right age. In secondary school, the non-poor have higher net and gross rates, and their differences are larger. This points to the fact that a larger share of the non-poor attends secondary, even though they may be over-aged, compared to the poor. In other words, attendance of the poor to school drops more than the non-poor after primary.

Table 3.5: Enrollment rates by poverty and urban-rural divide

	Urban		Rural		National	
	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor
Net enrollment rates						
Primary (8-11)	89	89	90	86	90	87
Secondary (12-17)	88	75	69	59	81	67
Gross enrollment rates						
Primary (8-11)	107	115	110	108	108	111
Secondary (12-17)	96	82	73	64	88	73

Source: 2002/03 HIES/LSMS.

Information by poverty status and gender is displayed in Table 3.6. Again very similar net rates are found for primary levels. Gross rates are reasonably similar, except among poor women where the problem of misalignment of grade by age is extremely acute. In the case of secondary, the non-poor exhibit better net and gross rates of enrollment, reflecting that a higher share of both male and female non-poor attend secondary, whether it is at the right or at a later age.

Table 3.6: Enrollment rates by poverty and gender

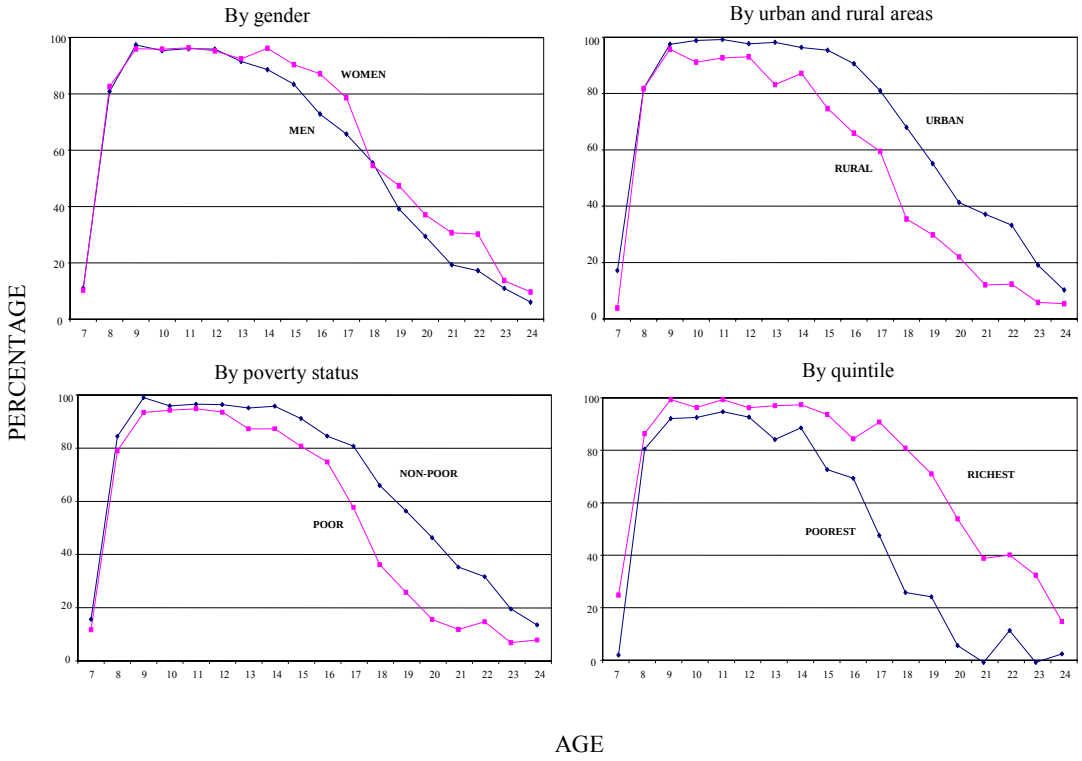
	Men		Women	
	Non-poor	Poor	Non-poor	Poor
Net enrollment rates				
Primary (8-11)	90	88	90	87
Secondary (12-17)	78	63	83	71
Gross enrollment rates				
Primary (8-11)	110	106	107	116
Secondary (12-17)	86	69	89	77

Source: 2002/03 HIES/LSMS.

Participation rates

Another way of looking at enrollment is through participation rates[51]. Figure 3.2 shows these indicators by age and several variables of interest such as gender, urban-rural divide, poverty status and consumption quintile. Overall, women, urban residents, the non-poor and individuals from the richest quintile are more likely to attend school. A couple of findings hold for the four comparisons. First, participation rates for primary school (ages 8 to 11) are almost universal, more than 90% on average. Second, by the second or third year of secondary school differences start to appear, although remain less than ten points. But by the time students are supposed to be enrolled at the 8th grade of school (or 8th grade of secondary as it is called in Mongolia), disparities are quite significant. For instance, among 15 years old, only one out of twenty in urban areas do not attend school compared to one out of four in rural regions. The gap grows wider when the inspection is done across quintiles. By the time students are supposed to finish secondary, the share of those attending school among the poorest quintile is almost half than that of the well-off, 48% and 91% respectively.

Figure 3.2: Participation rates



Source: 2002/03 HIES/LSMS.

[51] Participation rate is defined as the percentage of the population currently attending any educational institution. It excludes pre-school attendance.

Profile of current students

What are the characteristics of those currently attending school? Table 3.7 shows the level of education in which students are enrolled, the proportion of female students and the share of those attending public institutions, by an urban-rural divide and poverty status[52]. Disparities in attendance to education levels are patent. On average the non-poor attend higher levels than the poor. For instance, almost half of the poor attend primary school compared to less than one third of the non-poor. Only one of twenty poor is going to vocational or tertiary education, while one fifth of the non-poor does so. Attendance to secondary school is similar, around half of both groups is currently attending that level. The same overall trend is observed in both urban and rural areas, although the former display a significantly higher enrollment in tertiary education.

Nationwide, female students account for barely more than half of the students. The higher the level, the larger the proportion of women. The exception is vocational and other education but these levels comprise less than 2% of all current students. That pattern is more evident among the poor, perhaps reflecting the fact that poor men sometimes prefer to enter the labor market rather than to continue their studies. These findings hold generally for urban and rural areas.

Public schools are widespread in the country, particularly for primary and secondary. Less than 2% of students attending those levels go to private school. However, the evidence suggests that in urban regions the non-poor are more likely to attend private institutions. No differences are found in rural areas. Once students go to tertiary education, two things change. Only a quarter of these students go to public institutions, which points out to the increase of private universities, mainly in urban areas. Moreover, among those attending, the non-poor have more chances to benefit from public education, particularly if they live in soum centers or in the countryside.

Another aspect that influences school attendance is given by the facilities to access the school. Table 3.8 displays the average one-way distance and time to get to the school from the dwelling of the students. Primary and secondary schools are on average less than 2 kilometers away from home. The poor are closer to schools than the non-poor but in terms of time spent to get there, both groups spend similar amounts, around 15 minutes. This is explained by the fact that a larger proportion of the non-poor go to school by car rather than walking.

[52] Additional information on the characteristics of current students can be found in Tables D.17 and D.18 in Appendix D.

Table 3.7: Characteristics of current students

	Urban			Rural			National		
	Non-poor	Poor	Total	Non-poor	Poor	Total	Non-poor	Poor	Total
Level of education (%)									
Primary	26.4	38.2	29.9	36.1	51.0	43.1	29.5	44.5	34.9
Secondary	50.0	55.0	51.5	47.7	44.8	46.4	49.3	50.0	49.6
University	22.1	6.1	17.3	14.6	2.4	8.9	19.7	4.3	14.1
Vocational, other	1.5	0.7	1.2	1.6	1.8	1.7	1.5	1.2	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Female students (%)									
Primary	52.2	51.2	51.8	44.1	49.4	47.1	49.1	50.2	49.6
Secondary	50.9	54.4	52.1	55.9	54.8	55.4	52.5	54.6	53.2
University	56.6	70.3	58.1	66.8	55.4	65.3	59.0	66.2	59.8
Vocational, other	47.4	18.9	42.7	56.7	41.0	48.9	50.5	34.7	45.5
Total	52.5	53.9	52.9	53.2	51.9	52.6	52.7	52.9	52.8
In public schools (%)									
Primary	95.3	99.4	96.9	99.0	100.0	99.6	96.8	99.8	98.2
Secondary	96.7	99.7	97.6	99.9	99.6	99.7	97.7	99.6	98.4
University	74.2	67.6	73.5	77.8	81.0	78.2	75.1	71.3	74.6
Vocational, other	91.0	85.5	90.1	100.0	100.0	100.0	94.0	95.9	94.6
Total	91.3	97.5	93.2	96.3	99.3	97.7	92.9	98.4	94.9

Source: 2002/03 HIES/LSMS.

Table 3.8: One-way distance to school facilities

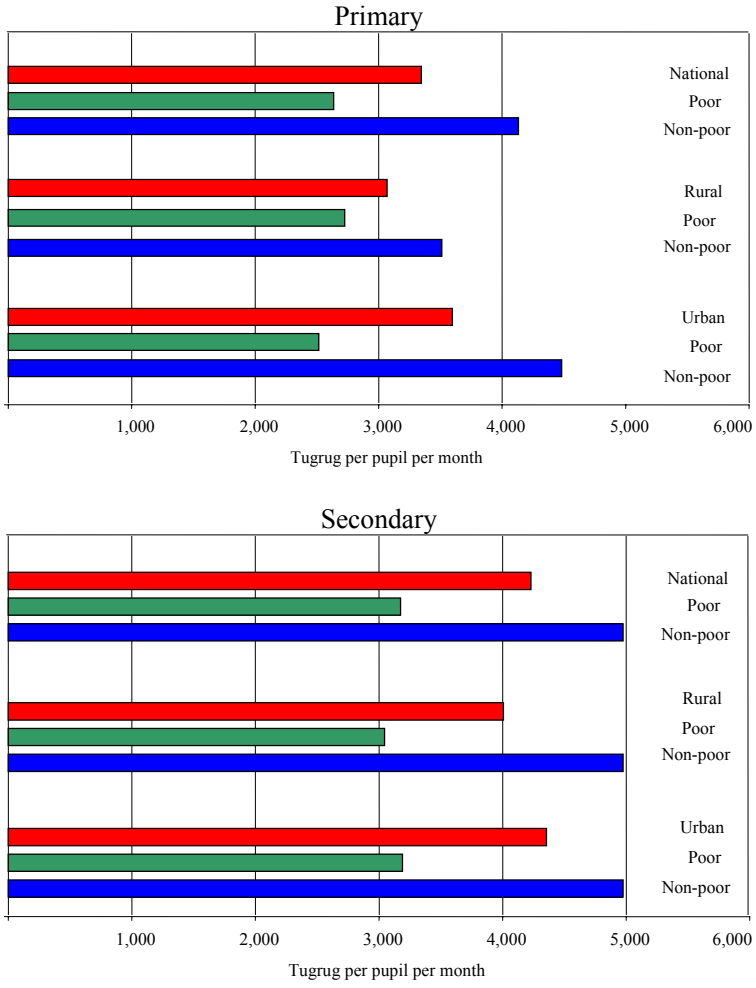
	Urban			Rural			National		
	Non-poor	Poor	Total	Non-poor	Poor	Total	Non-poor	Poor	Total
Distance (kms)									
Primary	1.7	1.2	1.5	1.9	1.4	1.6	1.8	1.3	1.6
Secondary	1.8	1.8	1.8	1.3	1.6	1.4	1.6	1.7	1.7
University	6.3	7.7	6.4	5.2	4.0	5.0	6.0	6.6	6.1
Vocational, other	3.9	1.6	3.6	2.8	1.1	1.9	3.6	1.2	2.8
Total	2.8	1.9	2.5	2.1	1.6	1.8	2.6	1.7	2.3
Distance (minutes)									
Primary	14	14	14	12	13	13	13	14	13
Secondary	14	15	14	11	13	12	13	14	14
University	25	30	26	23	15	22	25	26	25
Vocational, other	26	15	24	13	24	19	22	22	22
Total	17	16	16	13	13	13	16	15	15

Source: 2002/03 HIES/LSMS.

School expenditures

What are the levels of household spending in public education in the country? Figure 3.3 provides information on these expenditures per pupil by poverty status and urban-rural divide[53]. First, non-poor students spend more than the poor, on average sixty percent more in both primary and secondary. This holds within urban and rural regions, although the extra spending in rural primary schools is only a quarter more. Second, spending per student in urban areas is higher than in rural regions. But this hides differences along the poverty dimension. In primary schools, the urban non-poor spend more than their rural counterparts, but the opposite occurs among the poor. In secondary schools similar levels are observed.

Figure 3.3: Spending per pupil in public primary and secondary



Source: 2002/03 HIES/LSMS.

[53] Only public education was considered because the proportion of private students in primary and secondary is negligible. University was not included because the breakdown into urban and rural areas, and poor and non-poor reduces drastically the number of cases.

Table 3.9 shows the distribution and levels of school expenditure per pupil in public primary and secondary schools by quintiles. The cost of schooling rises with the position of the households in the consumption distribution. Students from the richest quintile spend more than double than the poorest both in primary and secondary. Expenditures in tuition represent around one tenth for the richest while they are insignificant for the rest. The main component of spending is books, around 45%, although for the poorest it rises close to 60%. Uniforms and food and other expenses while away from home account for another quarter of total expenditures.

Table 3.9: Spending per pupil in public primary and secondary

	Poorest	Q2	Q3	Q4	Richest	Total
Primary (%)						
Room rent	0.0	0.1	0.0	0.4	1.0	0.3
Food to pay for room	1.9	6.7	1.0	5.9	2.2	3.5
Transport	1.1	3.3	3.6	6.6	3.4	3.6
Tuition	0.2	2.5	2.3	2.0	9.1	3.3
Books	59.1	45.7	46.0	42.0	42.5	46.9
Uniforms	15.7	13.7	16.4	13.0	12.6	14.3
Expenses away from home	4.8	8.7	12.2	13.6	14.3	10.8
Other	17.2	19.3	18.4	16.6	15.0	17.3
Total (Tugrug/person/month)	2,239	3,052	3,707	4,050	4,790	3,348
Secondary (%)						
Room rent	0.3	1.0	0.0	0.4	0.4	0.4
Food to pay for room	1.1	2.9	1.4	3.8	2.2	2.4
Transport	3.9	6.2	7.3	6.8	5.8	6.2
Tuition	1.7	0.6	3.3	3.5	10.9	4.5
Books	57.8	46.4	43.1	41.8	35.4	43.4
Uniforms	10.9	11.6	10.1	8.4	7.6	9.5
Expenses away from home	7.6	10.9	18.3	15.9	17.6	14.9
Other	16.7	20.4	16.4	19.5	20.0	18.7
Total (Tugrug/person/month)	2,670	3,607	4,390	4,778	6,004	4,233

Source: 2002/03 HIES/LSMS.

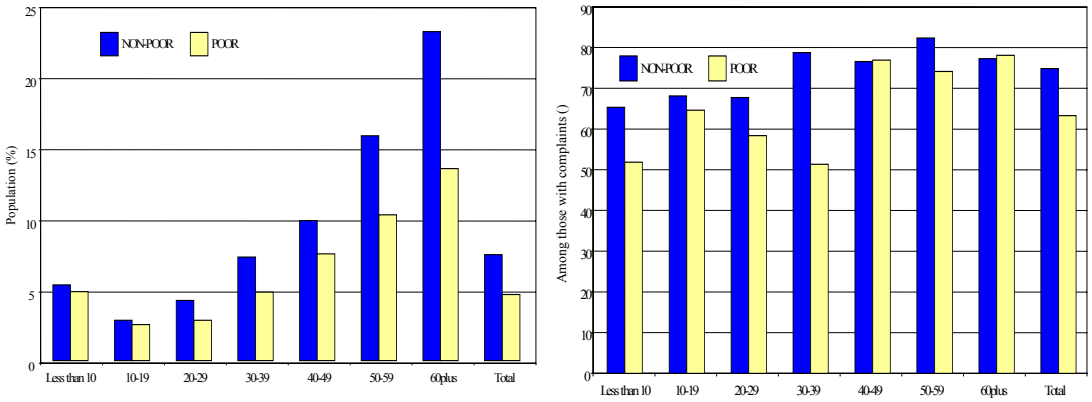
3.2. Health

This section examines some features of the health sector in Mongolia. It looks first at intermediate indicators such as morbidity rates and utilization of health care facilities. Later, other outcomes are analyzed such as spending on health and knowledge about sexually transmitted diseases. Finally, reproductive health is evaluated by assessing the use of contraceptive methods, antenatal care and delivery assistance, and the incidence of abortion.

Morbidity and treatment

One indicator of the health status of the population is the morbidity rate. Although not without limitations, it can provide useful information[54]. Figure 3.4 displays these rates along with the probability of seeking treatment, conditional on having reported a health complaint, by poverty status and age groups. A few findings are worth highlighting. First, the self-reported morbidity rate in the month previous to the survey is very low, only 6% of the population had any health complaints. Second, with the exception of the population less than 10 years, the older the person, the higher the chances of reporting a health complaint. For instance, one out of seven individuals in their fifties had some health complaint compared to a quarter of that share among those in their twenties.

Figure 3.4: Morbidity rates and probability of seeking treatment



Source: 2002/03 HIES/LSMS.

Third, the non-poor report more health complaints than the poor, and the differences grow larger the older the person gets. This is a result found also in other countries and could be a reflection of many factors such as education or interaction with health providers, which are elements where the non-poor have usually an advantage over the poor, and make them more aware of their health conditions. Hence the non-poor tend to report more accurately their health problems, while the poor tend to ignore them. Fourth,

[54] The morbidity rate from the household survey is based on the perception of the respondents on their health status during the last month. But people perceiving themselves as healthy or ill will probably vary according to their own and particular circumstances. For instance, someone who has been ill for some time might report no health complaints, when in fact what has happened is that he has already adapted to his illness. Or it could be the case that the person is not answering by himself, so the respondent might not know whether or not the other household member had a health complaint.

seven out of ten people reporting health complaints sought treatment. Although there are differences in the likelihood of seeking treatment across age groups, differences as not as large as for reporting health complaints, and there is no specific emerging trend. The non-poor sought treatment more often than the poor, on average three out of four non-poor looked for treatment compared to three out of five poor people.

Table 3.10 provides information among the population with health complaints. The most usual types of complaints are heart, circulatory and respiratory problems. The first two are more common among the non-poor, whereas the latter is more frequent among the poor. Similar patterns are found across urban and rural areas as well as by gender. The share of population with health complaints that saw their daily activities disrupted is slightly higher than fifty percent. The non-poor reported more disrupted days in the last month than the poor, perhaps reflecting the fact that they can afford doing so.

Table 3.10: Population reporting health complaints

	National	Urban	Rural	Men	Women	Non-poor	Poor
Complaints (% population)	6.4	6.5	6.4	5.2	7.6	7.4	4.6
Among those with complaints (%),							
Type of health complaint							
Heart, circulatory	30	33	25	28	31	33	20
Respiratory	28	27	30	28	28	26	36
Digestive	14	14	15	15	14	15	12
Mental	10	10	10	11	9	9	12
Urinary/sexual	14	15	13	11	16	14	13
Other	19	17	21	20	18	19	18
Disrupted daily activities (%)	53	51	55	55	52	54	50
Days in the last month (days)	16	17	14	16	16	17	14
Sought treatment? (%)	71	74	68	70	72	74	63
Visited public facilities	94	92	97	95	94	92	100
Among them, place of treatment was							
Central hospital, specialized clinic	24	33	12	24	24	25	20
District (aimag) clinic	26	32	18	23	28	28	20
Family clinic	31	14	53	33	30	28	41
Home	18	19	16	20	17	18	19
Attended by a doctor	97	100	94	96	98	97	97
Not sought treatment (%)	29	26	32	30	28	26	37
Reasons for not seeking							
Not serious enough	58	64	53	60	57	49	76
Treated myself	26	24	28	25	27	34	9
Other	16	13	19	16	16	17	15

Source: 2002/03 HIES/LSMS.

The extensive health system in the country is reflected in the fact, that among the population that sough treatment, 94% visited public facilities. Urban dwellers and the non-poor are more likely to visit private providers. Treatment for three out of ten of those visiting public facilities was provided in a family clinic, one quarter went to district or aimag clinics, and another quarter to central hospitals or specialized clinics. The poor, and especially rural residents, are more likely to benefit from family clinics. No differences are found by gender. Lastly, almost all the people who looked for treatment were attended by a doctor, similar figures are observed across poverty status and gender,

yet rural residents are less likely to have been attended by a doctor than their urban counterparts.

What are the main reasons for not looking for treatment if the person reported a health complaint? Three out of five regarded the complaint as not serious enough and a quarter treated the complaint by themselves. This pattern varies by poverty status, three out of four poor did not take seriously the complaint compared to half of the non-poor. Self-treatment is more usual among the non-poor than among the poor, 34% and 9% respectively.

Spending

Health spending represents 5% in the total consumption of the household. Table 3.11 displays the levels and patterns of per capita monthly health expenditure across urban and rural areas, poverty status and consumption quintiles. The first finding is that the variation in the level of spending is much larger than the differences on the share of health in consumption. For instance, whereas in both urban and rural areas expenditure shares are similar, urban spending is forty percent higher than rural expenditure. Second, the non-poor spend more than three times as much as the poor. This pattern is even more evident when looking across quintiles, the richest 20% of the population have an expenditure almost seven times higher than the bottom 20%. Third, spending on self-prescribed medicines represents almost half the total spending on health, and this rises to two thirds among the poor. The better-off the person in the consumption distribution, the less the significance of medicines in health spending: among the bottom 20% this figure stands at three quarters of total expenditure, whereas among the top 20% only at one third.

Table 3.11: Per capita monthly health spending (Tugrug)

	National	Urban	Rural	Non-poor	Poor	Poorest	Q2	Q3	Q4	Richest
Outpatient visits	819	1,016	572	1,196	152	107	244	528	625	2,591
Service (%)	80	84	70	80	75	80	74	80	79	81
Transportation (%)	17	12	28	17	22	17	22	18	19	16
Gifts (%)	3	4	2	3	3	3	4	2	2	3
Medicines	904	971	822	1,107	546	503	597	837	1,009	1,577
Public hospital stays	137	132	144	178	65	50	86	170	161	221
Service (%)	72	75	67	72	66	68	70	82	66	69
Transportation (%)	22	16	28	21	28	24	26	13	26	23
Gifts (%)	7	9	4	7	6	8	5	5	7	8
Private hospital stays	52	75	24	74	13	8	16	24	71	141
Service (%)	67	65	75	69	46	50	44	83	70	67
Transportation (%)	31	32	25	28	54	50	56	17	30	29
Gifts (%)	2	3	0	3	0	0	0	0	0	4
Reproductive health a/	5	7	3	6	3	4	4	3	4	12
Total health spending	1,919	2,204	1,564	2,561	782	672	947	1,564	1,871	4,542
Share in total consumption	5.2	5.5	4.8	5.4	4.5	4.9	4.2	5.1	4.4	6.1

a/ Refers to expenditures related to pregnancies in the last year. Includes the cost of pre-natal consultations and delivery expenditures.
Note: Gifts given or bribes paid during the outpatient visits or stays in the hospital.
Source: 2002/03 HIES/LSMS.

Fourth, excluding spending on medicines, total health expenditure can be divided into the cost of the service per se, transportation and gifts given to the health providers. The service per se accounts for almost four fifths of total spending, transportation to the health facility makes up for one fifth, and the remaining consists of gifts given to the health provider. No major differences in the share patterns are found across poverty status or quintiles. However, in rural regions transportation becomes more important, not only its share increases to almost one third but also the level of spending is twenty percent higher than in urban areas. By contrast, in urban areas the service per se is more significant, its share is higher and the amount spent is double that in rural regions. Even larger gaps in the levels of spending are observed when excluding medicines across poverty status, the non-poor spend more than five times the amount of the poor in both the cost of the service and transportation.

Knowledge about STD

Sexually transmitted diseases (STD) are a major health concern worldwide and can impose significant burdens to the population, especially to the poor and the less educated. The household survey collected information about knowledge of STD only from people 15 years and older who were available to answer individually such questions. Overall information is available for 43% of all people 15 years and older (see Table 3.12). Rural residents, women and the non-poor are more likely to provide answers in this section of the questionnaire. Among the respondents, more than nine out of ten have heard about STD, which is an extremely high percentage. Knowledge is more common in urban areas than in rural regions but no differences are found by gender or poverty status. What are the diseases that the population has heard about? Almost nine out of ten with awareness of STD knew about AIDS, seven out of ten about syphilis and two thirds about gonorrhea. Patterns are similar across gender and poverty status. However urban dwellers are consistently more familiar with any STD than rural residents. Lastly, having only one sex partner or using condoms were mentioned by three fifths of the respondents as the most known ways to protect themselves against these diseases. The non-poor, women and urban residents are generally better informed about these two methods of protection.

Table 3.12: Knowledge about STD

	National	Urban	Rural	Men	Women	Non-poor	Poor
Answering by themselves (%)	43	40	47	38	48	45	40
Among those answering by themselves, Heard about STD? (%)	92	95	88	91	92	92	91
Among those that heard (%),							
Diseases							
Syphilis	72	74	69	71	72	73	69
Gonorrhea	66	73	59	65	67	69	61
AIDS	88	91	84	90	87	88	87
Others a/	28	33	20	18	34	29	24
Don't know	4	2	6	4	4	4	5
What do to? (%)							
One partner	59	64	53	58	60	61	55
Use of condoms	62	68	54	60	63	63	58
Others b/	44	49	38	38	49	46	39
Don't know	11	7	17	12	10	9	15

a/ Genital warts, condylomata, and others. *b/ Abstinence, avoid sex with prostitutes, seek medical treatment, and others.*
Source: 2002/03 HIES/LSMS.

Reproductive health

According to the household survey 63% of all currently married women between 15 and 49 years had used contraceptive methods[55]. Although no major differences are found by urban-rural divide, poverty status or quintiles, some distinctions are observed by level of education (see Table 3.13). The highest the level of education attained, the higher the chances of had used contraceptive methods. Among women that have ever used contraceptive methods, the share of women currently using them is very high, more than nine out of ten are doing so. Poor women are more likely to be currently using contraceptive methods but no clear pattern emerges by education level. Which methods are the most prevalent? Almost half of women use IUD, followed by pills and calendar. IUD and injections are most frequent among the poor and rural, whereas pills and calendar are preferred among non-poor and urban women.

[55] It also includes unmarried women living with a partner. The household survey collected information on all women 15 years and older but the analysis will focus on those between 15 to 49 years. See Table D.19 in Appendix D for information on all women 15 to 49 years old.

Table 3.13: Use of contraceptive methods

	National	Urban	Rural	Non-poor	Poor	Poorest	Q2	Q3	Q4	Richest
Ever used contraceptive methods (%)	63	63	62	63	62	64	59	64	61	65
None, primary	45	54	43	35	56	47	61	39	25	42
Sec. 8th grade	55	55	55	52	60	65	48	59	49	49
Complete secondary	66	63	69	67	63	63	64	63	68	72
Vocational, tertiary	68	66	74	69	67	73	62	75	66	68
Among women that had used,										
Current use of contraceptive methods (%)	93	93	93	92	95	96	94	91	94	91
None, primary	90	94	89	93	88	83	93	100	100	70
Sec. 8th grade	92	94	92	88	96	99	93	82	95	87
Complete secondary	95	94	97	94	97	98	97	94	95	93
Vocational, tertiary	92	92	92	91	94	95	91	91	92	91
Which method? (%)										
IUD	49	46	52	46	54	55	48	51	45	46
Pill, drugs	17	18	15	18	14	13	20	16	20	16
Calendar	14	17	9	17	7	5	10	17	16	18
Injection	10	6	14	8	13	15	11	9	8	7
Condom	8	10	6	8	7	8	6	6	8	11
Others a/	3	2	4	3	4	3	5	3	3	2

a/ Includes abstinence, withdrawal, patch, male or female sterilization, diaphragm, and spermicide.
Source: 2002/03 HIES/LSMS.

Antenatal care has reached almost universal levels in Mongolia, almost all women who had children in the two years previous to the survey consulted a health care professional during their pregnancies (see Table 3.14). Urban women are more likely to seek pre-natal treatment than rural women but no differences are observed by poverty status. Nine consultations is the average number of pre-natal check-ups among women who sought medical advice, and most of these consultations are free. Virtually all deliveries are done in a hospital and some payment was made in a fifth of them. Delivery expenditures and gifts given to the health provider are more common in urban areas and among the non-poor.

Table 3.14: Antenatal care

	National	Urban	Rural	Non-poor	Poor	Poorest	Q2	Q3	Q4	Richest
Pre-natal consultations (%)	98	100	96	97	99	99	97	95	96	100
Number of consults	9	10	8	9	8	9	8	9	9	9
Paid consults (%)	7	9	6	7	8	7	12	4	5	10
Delivery in a hospital (%)	98	100	97	98	98	100	95	97	98	99
Paid delivery (%)	20	25	16	20	19	21	19	17	23	18
Gifts given for the delivery (%)	23	28	19	25	20	22	18	21	26	30

Source: 2002/03 HIES/LSMS.

A final subject regarding reproductive health is that of abortions. One fifth of currently married women between 15 to 49 years reported having had an abortion during their life (see Table 3.15). Clearer trends appear when analyzing this topic. Urban, non-poor and more educated women are more likely to have had abortions. For instance, one quarter of women with vocational or tertiary education reported an abortion compared to one tenth

of those with less than complete secondary. Three out of ten women said that the main reasons for the abortion were health considerations, and this is particularly important in rural areas where this share increases to more than four tenths. Not wanting the child is relatively a more frequent motive among the non-poor and women in the richest quintile than for the rest of women. By contrast, lack of money becomes more important among the poor and particularly among women in the poorest quintile.

Table 3.15: Abortions

	National	Urban	Rural	Non-poor	Poor	Poorest	Q2	Q3	Q4	Richest
Ever had abortions? (%)	19	25	12	21	14	15	13	20	21	25
None, primary	10	23	8	10	10	12	6	13	11	9
Sec. 8th grade	12	18	9	11	13	17	7	10	10	16
Complete secondary	17	23	9	19	13	12	13	19	25	16
Vocational, tertiary	26	29	21	28	20	16	21	29	24	32
Reasons for abortion (%)										
Due to health	30	25	42	30	28	27	27	27	28	35
Do not want a child	21	22	18	24	11	12	13	18	22	31
Too soon to give birth again	22	23	19	20	26	20	31	26	21	16
Lack of money	19	21	16	16	29	35	22	23	17	9
Others a/	8	10	5	9	6	5	8	6	11	9

a/ Attending school, not married, others.
Source: 2002/03 HIES/LSMS.

3.3. Labor market

This section briefly reviews some characteristics of the labor market and employment in the country. It starts by looking at labor participation rates. Then the main sectors of employment and occupations of the working population are examined. Finally, unemployment rates are analyzed.

Labor force participation

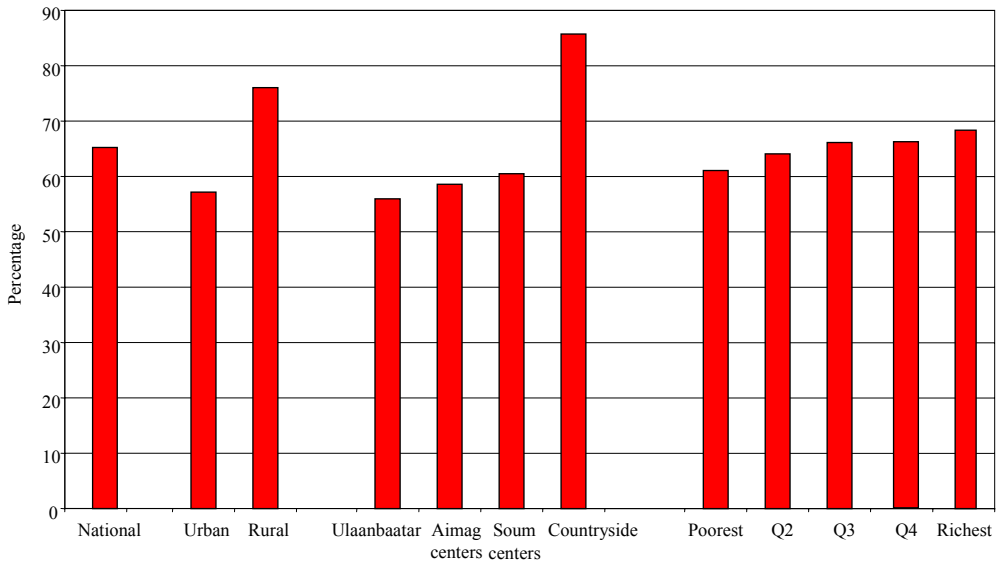
The standard approach to measure labor force participation for the economically active population is defined by the International Labor Organization[56]. In Mongolia, the labor force participation rate stands at 65%[57]. Urban areas have significantly lower participation rates than rural regions, less than three fifths compared to three quarters respectively. But this finding is driven by a very high participation rate in the countryside, whereas in the rest of the country results are quite similar (see Figure 3.5). Across regions, the highest participation is found in the Highlands, where three out of four residents participate in the labor force, and the lowest in the Central region, where

[56] The labor force is comprised by all people employed or unemployed i.e. those that worked in the last week, those that did not work in the last week but had a permanent job, and those that did not work in the last week, did not have a permanent job but looked for work. The rest of the population is considered out of the labor force.

[57] The labor force participation rate is the ratio between the labor force and the population in the relevant age group. Typically labor force statistics are based on the population between 15 and 64 years old. However, in Mongolia, a different age-cut is used, 16 to 59 for men and 16 to 54 for women. Table D.21 in Appendix D compares the labor force participation rates according to both definitions. The Mongolian approach shows participation rates higher than the international approach. The table also displays figures from two other sources: the 2003 Labor Force Survey and administrative offices.

just three out of five do so[58]. The analysis by quintile reveals no major variation among participation rates, except perhaps when comparing the poorest with the richest. Education levels display a more mixed picture, rates are lowest among those with complete secondary and highest among those with degrees higher than secondary, especially among people with tertiary education.

Figure 3.5: Labor force participation rates



Source: 2002/03 HIES/LSMS.

Participation rates by poverty status are shown in Table 3.16, which also displays results along the gender dimension and urban-rural divide. A few results are worth noticing. First, the poor are less likely to participate in the labor market compared to the non-poor, particularly in urban areas and among women. Second, men have consistently higher participation rates than women, which is a result that holds also across quintiles and education levels. Third, urban dwellers participate less in the labor force, especially among men. The gap is substantial for those of younger age (less than 25) and for those with less than complete secondary.

[58] See Tables D.22 and D.23 in Appendix D for more information on labor force participation rates by gender and poverty status.

Table 3.16: Labor force participation rates by poverty status

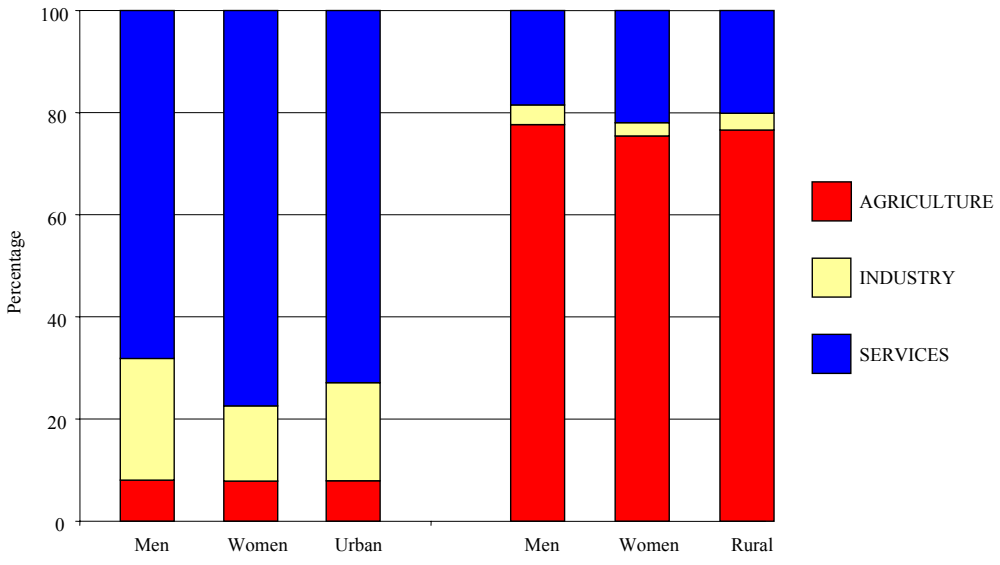
	Men			Women			National		
	Non-poor	Poor	Total	Non-poor	Poor	Total	Non-poor	Poor	Total
Urban	60.8	51.7	58.2	58.7	49.4	56.1	59.7	50.5	57.1
Rural	81.9	76.0	79.5	74.0	70.2	72.5	78.0	73.1	76.0
Total	69.1	64.6	67.6	64.4	59.9	62.9	66.7	62.2	65.2

Source: 2002/03 HIES/LSMS.

Employment

Services is the main sector of employment in Mongolia and agriculture ranks second in a very close position, 46% and 43% respectively. However this pattern is completely different in urban and rural areas (see Figure 3.6). In the capital and aimag centers, services account for almost three quarters of those employed, industry stands for one fifth and the remaining is involved in agriculture. By contrast, in soum centers and the countryside, livestock and farming activities make up for three quarters of employment, services for a fifth and industry for the rest. The second finding is that differences among men and women are minor within each area, maybe with the exception that in urban areas, men are more likely to be employed in industry and women in services.

Figure 3.6: Sector of employment by urban-rural divide and gender



Source: 2002/03 HIES/LSMS.

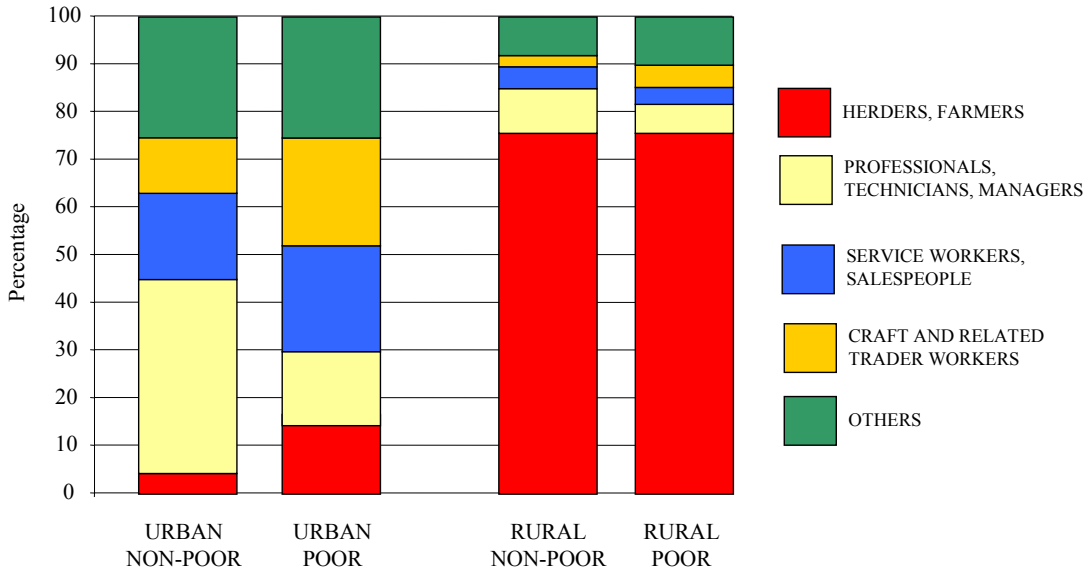
What are the differences in employment along the poverty dimension? The poor are more likely to be engaged in agriculture activities, five out of nine do so, and only a third is in services (see Table D.26 in Appendix D). The reverse finding is found among the non-poor. Urban and rural areas display the same national pattern but in the former it is more

pronounced. A closer look within services in urban areas reveals that a fifth of these jobs is in trade, almost one out of seven is in the public administration and a quarter in the education and health sectors. A similar composition is observed among the poor and the non-poor.

A second way to classify the employed population is according to whether they are in the private or public sector or in a state company. Nationwide, less than three quarters are in the private sector, almost a quarter in the public sector and not even one out of twenty in state companies. This result stands across urban and rural regions, although the sector composition shifts, the private share increases to five sixths in rural areas and the non-private rises to two fifths in urban areas. Being employed in a public institution or in a state company seems to be correlated with higher living standards, one third of the non-poor work there compared to only a fifth of the poor.

The occupation of those employed provides a third approach to categorize them. In Mongolia, herders and farmers are by far the most important group, they account for two fifths of workers. The three other main groups are service employees and salespeople, and craft and related trade workers. Each one of these groups has a share of about ten percent. Figure 3.7 shows a division by poverty status and urban-rural divide. In both regions the non-poor have more than double chances than the poor to be working in occupations that require more education and skills such as being managers, professionals and technicians. The likelihood of being employed in services or in sales is similar regardless of the poverty status, but varies by region. Craft and related trader occupations, which includes miners, carpenters and textile workers, are more related with the poor, particularly in the capital and aimag centers, where they account for more than a fifth of their jobs compared to half that for the non-poor.

Figure 3.7: Occupation of the working population by poverty and urban-rural divide



Source: 2002/03 HIES/LSMS.

Unemployment

According to the household survey the unemployment rate is 6.6%. Urban areas present unemployment rates significantly higher than rural regions, one out of eleven urban dwellers participating in the labor force was looking for a job compared to less than half that share for rural residents[59]. Unemployment is highest among the youth, those under 25 years have an unemployment rate that is almost double the national figure. Population with tertiary education displays the lowest unemployment rates. Men and women have similar unemployment rates at the national level. In urban areas men show slightly higher rates whereas the opposite occurs in rural regions (see Table 3.17). Finally, the poor have considerably higher unemployment rates than the non-poor, especially in urban areas.

[59] See Table D.24 in Appendix D for a characterization of the population by labor force status and along several variables of interest. Tables D.27 and D.28 show unemployment rates by gender and poverty status.

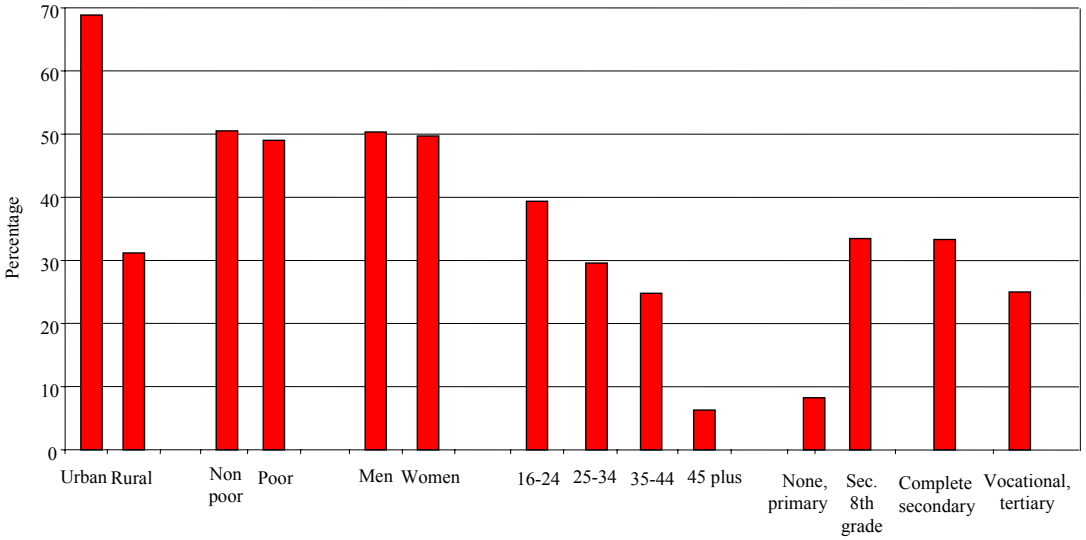
Table 3.17: Unemployment rates by poverty, gender and urban-rural

	Gender		Poverty		Total
	Men	Women	Non-poor	Poor	
Urban	9.5	8.6	6.8	15.9	9.1
Rural	3.7	4.6	2.6	6.5	4.1
National	6.5	6.7	4.9	10.2	6.6

Source: 2002/03 HIES/LSMS.

What are the characteristics of the unemployed? Figure 3.8 depicts this group. They are mainly urban residents, seven out of ten unemployed live in the capital and aimag centers, with these two domains contributing with equal shares. They are likely to be young, two out of five are under 25 years, and three out of ten between 25 and 34 years old. There are no differences either by gender or by poverty status. As expected, education seems to offer some protection against unemployment, those with vocational or tertiary education comprise only a quarter of the unemployed.

Figure 3.8: Characteristics of the unemployed



Source: 2002/03 HIES/LSMS.

3.4. Safety nets

Safety nets typically play a key role in reducing economic insecurity and alleviating poverty. Their aim is to mitigate the adverse effects of economic, social, environmental and physical situations that affect the household ability to properly cope with them. These shocks can be permanent, such as a disability that hinders the faculty to work, or temporal, like unemployment. They can also have an effect on most members of a society, such as the occurrence of natural disasters, or be specific to a family, like the death of the main earner in the household. Different responses are designed for each one of them. Broadly speaking there are two types of networks that serve as safety nets: private safety nets, which involve traditional, and generally informal, coping mechanisms based on community and family support; and public transfers, which are the response of the state to protect and help those that are vulnerable.

Mongolia possesses an extensive system of social protection, mainly insurance and assistance[60]. A large role of the state in providing social welfare is a fairly common situation among countries that have made the transition from socialist to market economies. But the population also relies in an informal support network. For instance, herders often exchange animals as a form of private transfers. This section examines first the extent and relative importance of formal and informal networks in the country. Then it analyzes the incidence of private and public transfers received by the household. Finally, it assesses the correlation between transfers and poverty levels.

Extent and importance of transfers

Table 3.18 summarizes information on safety nets in Mongolia according to whether the household is the recipient or the donor of transfers and remittances. Several findings are worth highlighting. First, the extent of these networks is impressive, four out of five households either give or receive some sort of transfer. Seventy percent of households are recipients, while every other family is a donor. Second, public and private transfers received by the households have a similar coverage but the former makes up for almost three quarters of the total amount transferred. Third, the main component of public transfers is the retirement pension. It reaches three out of ten households in the country and represents three quarters of the public funds. Fourth, nine out of ten Tugrug transferred from private sources to households come from relatives and friends. Other donors such as non-governmental and religious organizations account for the remaining. Fifth, among households benefiting from public transfers, these make up for a fifth of their consumption. On the other hand, private transfers represent on average only seven percent of the consumption of households that receive them. Lastly, the principal recipients of remittances given by households are family and friends, which receive almost nine tenths of the value of these transfers.

[60] Social insurance comprises benefits provided by the state to cover specific risks such as retirement pensions, unemployment or sickness benefits. Social assistance refers to benefits intended to provide protection to disadvantaged or vulnerable groups. These include disability or special pensions, and also family assistance, which is targeted particularly to children.

Table 3.18: Safety nets

	Households with transfers (%)	Population with transfers (%)	Among those receiving/giving		
			Average household transfer (Tugrug per month)	Share of consumption (%)	Share of total transfers (%)
Remittances and aid received	68.3	68.3	26,658	21.7	100.0
Remittances and aid	45.2	44.8	10,936	8.0	27.1
Family and friends	36.0	35.3	12,097	8.6	23.9
Others a/	12.7	12.8	4,632	4.0	3.2
Social welfare	46.1	46.1	28,735	24.2	72.9
State pension	29.1	27.7	33,199	27.4	53.1
Disability pension	8.9	10.1	17,783	15.7	8.7
Survivor pension	3.9	4.3	18,311	18.1	3.9
Maternity benefit	4.8	5.5	6,947	5.7	1.8
Child allowance	5.5	6.6	6,448	6.0	1.9
Others b/	4.2	4.5	14,948	11.5	3.4
Remittances and aid given	52.2	53.6	7,359	5.0	100.0
Family and friends	46.5	47.6	7,220	4.9	87.3
Others c/	13.0	13.9	3,749	2.5	12.7
Received or given	79.1	79.4	18,145 *	15.4 *	-

a/ Includes persons that are neither relatives nor friends, local or state governments, NGO's, and religious organizations.

b/ Includes special pension, unemployment benefits, illness payments, funeral payments and other benefits.

c/ Includes persons that are neither relatives nor friends, and religious or charitable organizations.

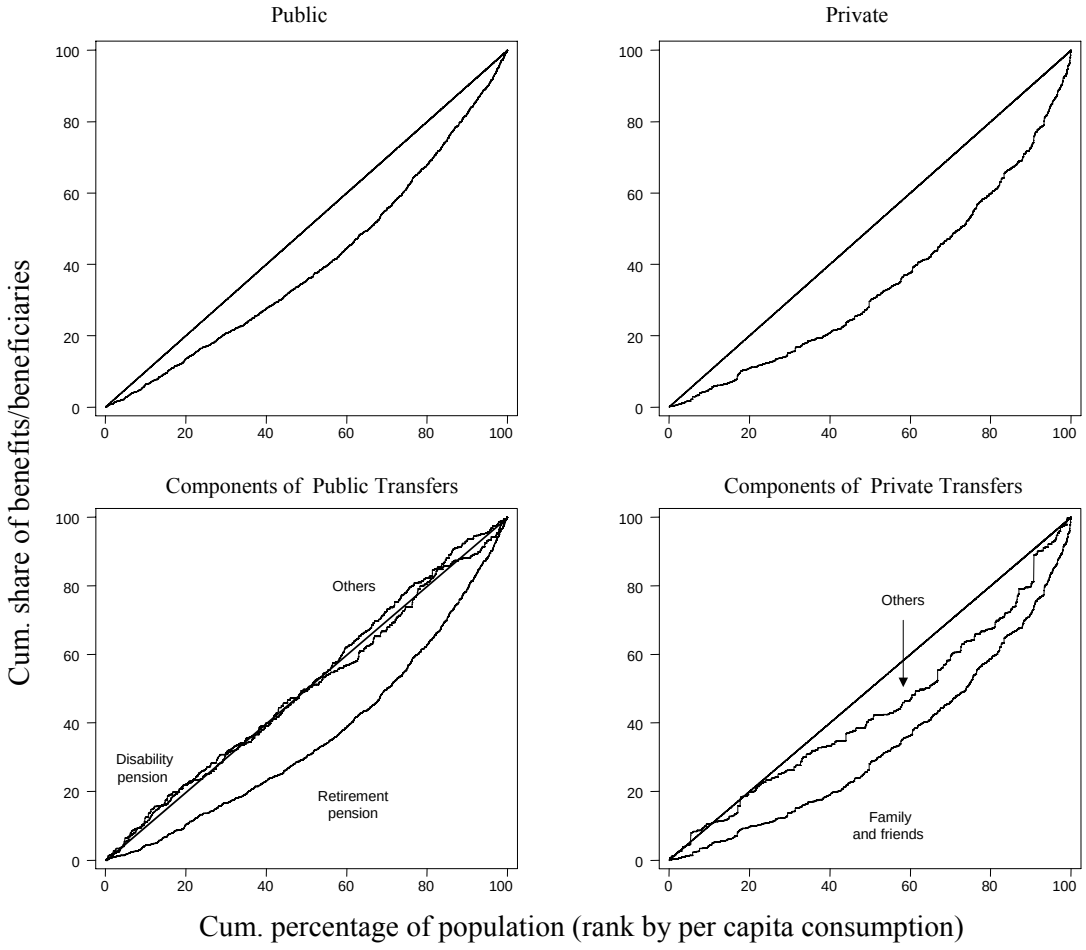
** Refers to net transfers: total remittances received by the household minus total transfers given.*

Source: 2002/03 HIES/LSMS.

Incidence of the transfers received by the household

What is the incidence of the public and private transfers received by households? Figure 3.9 plots the cumulative share of the remittances against the cumulative share of the population. Public transfers are regressive but there are differences in their composition. Retirement pensions are highly regressive, the bottom 40% of the population only receives 20% of these pensions, whereas the top 20% of Mongolians obtained 40% of these benefits. It shall be kept in mind that retirement pensions are not social assistance, they reflect the contributions made by workers to their retirement funds, hence this finding should not be understood as if the state is wrongly targeting these pensions. The rest of the social insurance and assistance, which accounts for 30% of public transfers, is largely neutral. Private transfers display a regressive pattern too, better-off households capture the most of them. Remittances coming from relatives and friends are highly regressive, while other private transfers are mildly regressive.

Figure 3.9: Public and private incidence of transfers received by households



Source: 2002/03 HIES/LSMS.

Poverty and transfers received by the household

One of the main objectives of safety networks is to provide households with the means to avoid economic insecurity and help some groups that may be vulnerable. The correlation between the incidence of poverty and whether or not the household receives a private or public transfer is shown in Table 3.19. Nationwide, similar levels of poverty are observed among those living in households getting transfers and those in households that do not get them. The split into an urban-rural divide shows that in the case of private transfers, the regional pattern follows the national trend. All poverty indicators are alike, regardless of whether or not the household receives private remittances. But for public transfers, there are some regional disparities. For instance, in urban areas the population living in households that received public transfers display higher levels of poverty, but the opposite is found in rural regions. However, in rural areas the result is reversed again when looking at the other two poverty measures.

Table 3.19: Poverty and transfers received by the household

	Private				Public			
	Urban		Rural		Urban		Rural	
	No	Yes	No	Yes	No	Yes	No	Yes
Headcount	30.0	30.6	43.7	43.0	25.2	35.3	44.8	41.3
	(2.3)	(2.2)	(3.0)	(3.2)	(1.9)	(2.4)	(2.7)	(3.1)
Poverty Gap	8.5	9.9	13.1	13.4	7.4	11.0	12.8	13.8
	(0.9)	(1.0)	(1.2)	(1.3)	(0.7)	(1.0)	(1.1)	(1.3)
Severity	3.4	4.6	5.4	5.7	3.2	4.7	5.1	6.1
	(0.4)	(0.6)	(0.7)	(0.7)	(0.4)	(0.5)	(0.5)	(0.8)
Memorandum items:								
Household size	4.4	4.3	4.3	4.2	4.3	4.5	4.4	4.1
Dependency ratio (%)	39.2	44.5	44.1	46.8	35.8	48.2	41.0	50.7
Children (% household size)	30.5	28.8	32.7	33.6	35.0	24.0	40.2	23.5
Age of household head	44.7	47.8	42.0	42.9	39.8	52.9	36.7	49.9
Male household head (%)	83.3	75.9	87.2	84.3	88.2	70.5	92.7	77.4
Share below PL (%)	23.4	23.1	32.7	20.9	19.4	27.1	32.5	21.0
Population share	28.2	27.3	27.1	17.5	27.7	27.7	26.2	18.4

Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Retirement pensions

Given the importance of public transfers, the link between retirement pensions, by far the most important component of those transfers, and poverty is also examined (see Table 3.20). At the national level, people living in households receiving these pensions are less poor than those who do not receive them. But this hides different regional patterns. In fact, while in rural areas poverty is significantly lower among those receiving these benefits, in urban areas there are no differences in poverty levels between recipients and non-recipients. A possible implication of this finding is that having a retirement pensioner in soum centers and the countryside improves the living standards of the other household members, which is possibly related to the fact that this is a regular source of income and it does not depend on seasonal patterns. The distribution of the poor is closely aligned with that of the population, around a quarter of the poor live in recipient households, this share increases to a third in urban areas but falls to less than a fifth in rural regions. Demographic indicators show clear trends too. Children represent a lower share among those receiving transfers but dependency ratios are higher, reflecting a larger share of elders within the household. Heads are much older and more likely to be female in households benefiting from these remittances.

Table 3.20: Poverty and retirement pensions

	National		Urban		Rural	
	No	Yes	No	Yes	No	Yes
Headcount	37.3	33.0	29.7	31.4	45.3	36.2
	(1.6)	(2.3)	(1.9)	(2.8)	(2.6)	(4.0)
Poverty Gap	11.3	10.2	9.4	8.8	13.4	12.7
	(0.6)	(1.0)	(0.8)	(1.0)	(1.0)	(2.0)
Severity	4.8	4.4	4.2	3.5	5.4	6.1
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(1.2)
Memorandum items:						
Household size	4.4	4.1	4.4	4.4	4.4	3.7
Dependency ratio (%)	38.5	55.1	36.4	53.0	40.8	58.5
Children (% household size)	37.6	15.6	35.5	17.5	39.7	12.7
Age of household head	38.6	58.7	40.1	58.7	37.0	58.5
Male household head (%)	87.7	70.0	84.8	68.9	90.8	71.9
Share below PL (%)	74.6	25.4	30.7	15.8	44.0	9.6
Population share	72.3	27.7	37.3	18.2	35.0	9.6

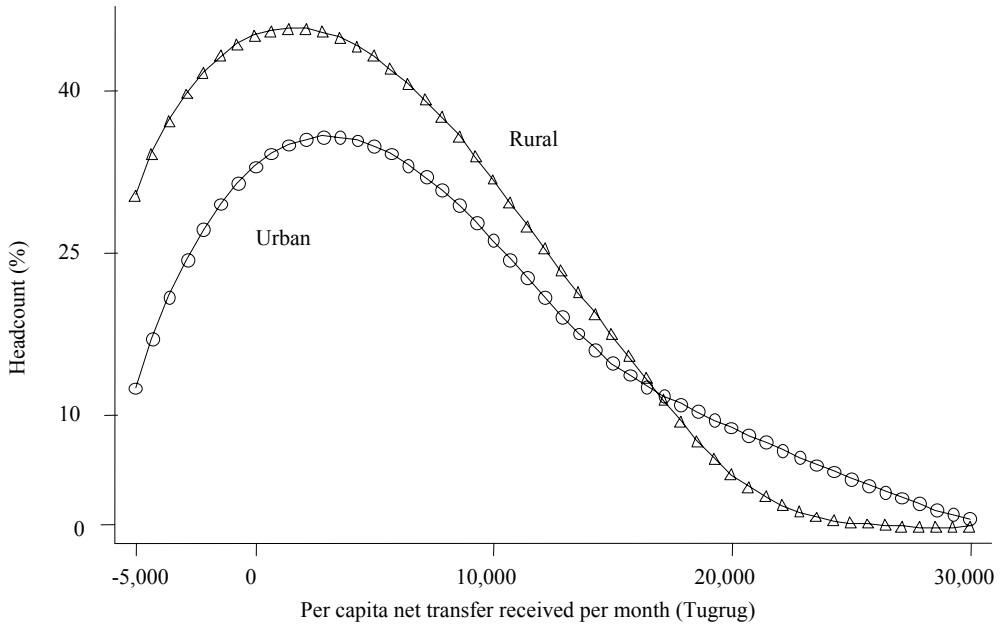
Note: Standard errors taking into account the survey design are shown in parentheses.
Source: 2002/03 HIES/LSMS.

Poverty and the level of transfers

Another issue to take into consideration is whether or not there is an association between the incidence of poverty and the level of the transfer received by the households. Figure 3.10 displays this relationship for urban and rural areas and with transfers measured in per capita net terms[61]. It clearly shows two findings that hold across both regions. People living in households that are net donors, i.e. those with negative net transfers, display a negative correlation between the amount of the transfer given and its poverty incidence. The more they transfer, the less poor they are. By contrast, among the population living in households that are net recipients, there is a negative association between the amount of transfer received and its level of poverty. The more they received, the less poor they are. The implication of these results is that although on average individuals in households receiving transfers are not better-off than those who do not get remittances, among those receiving, the amount received does matter.

[61] Net transfers are defined as the difference between both private and public transfers received by the family minus all remittances given to other households.

Figure 3.10: Poverty and net transfers received by the household



Source: 2002/03 HIES/LSMS.

REFERENCES

Deaton, Angus, 1997, *The Analysis of Household Surveys: A microeconometric approach to development policy*, published for The World Bank, The John Hopkins University Press, Baltimore and London.

Deaton, Angus and John Muellbauer, 1986, "On measuring child costs: with applications to poor countries", *Journal of Political Economy*, 94, 720-44.

Deaton, Angus and Salman Zaidi, 2002, "Guidelines for Constructing Consumption Aggregates for Welfare Analysis", LSMS Working Paper 135, World Bank, Washington, DC.

Griffin, Kenneth, 2001, *A Strategy for Poverty Reduction in Mongolia*, available at www.un-mongolia.mn/reports.

Hentschel, Jesko and Peter Lanjouw, 1996, "Constructing an Indicator of Consumption for the Analysis of Poverty: Principles and Illustrations with Principles to Ecuador", LSMS Working Paper 124, World Bank, Washington, DC.

Howes, Steven and Jean Olson Lanjouw, 1997, "Poverty Comparisons and Household Survey Design", LSMS Working Paper 129, World Bank, Washington, DC.

International Monetary Fund, 1999, *Country report No. 99/4*, available at www.imf.org.

International Monetary Fund, 2002, *Mongolia: Selected Issues and Statistical Appendix, Country Report No. 02/253*, available at www.imf.org.

Lanjouw, Peter, Branco Milanovic and Stefano Paternostro, 1998, "Poverty and Economic Transition: How Do Changes in Economies of Scale Affect Poverty Rates of Different Households?", Policy Research Working Paper 2009, World Bank, Washington, DC.

Ministry of Finance and Economy of Mongolia, 2003, *Effectiveness and Contributions of Official Development Assistance for Mongolia*, "Implementing the Economic Growth Support and Poverty Reduction Strategy", Mongolia Consultative Group Meeting, Tokyo, Japan.

National Statistical Office of Mongolia, 2002, *Mongolian Statistical Yearbook*, Ulaanbaatar.

National Statistical Office of Mongolia, 2003, *Internal Migration and Urbanization in Mongolia: Analysis based on the 2000 Census*, Ulaanbaatar.

National Statistical Office of Mongolia, 2004, Labor Force Survey with Child Activities Module 2002-2003, Survey Report of All Four Survey Rounds conducted during October 2002 – September 2003, Draft, Ulaanbaatar.

National Statistical Office of Mongolia and United Nations Development Programme, 1999, Living Standards Measurement 1998, Ulaanbaatar.

Nutrition Research Center et al., 2003, *Final report of a survey assessing the nutritional consequences of the Dzud in Mongolia*, available at www.un-mongolia.mn/reports.

Ravallion, Martin, 1996, "Issues in Measuring and Modeling Poverty", *The Economic Journal*, 106, 1328-1343.

Ravallion, Martin, 1998, "Poverty lines in theory and practice", LSMS Working Paper 133, World Bank, Washington, DC.

United Nations Development Programme Mongolia and Government of Mongolia, 2004, Human Development Report Mongolia 2003, Urban-Rural Disparities in Mongolia, Ulaanbaatar.

World Bank, 1996, Mongolia Poverty Assessment in a Transition Economy, East Asia and Pacific Regional Office, World Bank, Washington, DC.

A. APPENDIX A: SAMPLE DESIGN AND DATA QUALITY

This appendix provides some details on the general characteristics of the HIES-LSMS survey, the sample design and an overall assessment of the quality of the data.

A.1. An overview of the HIES-LSMS

The 2003 Living Standard Measurement Survey (LSMS) design has the peculiarity of being a sub-sample of a larger survey, namely the Household Income and Expenditure Survey (HIES). Instead of administering an independent consumption module, the LSMS depends on HIES information on household consumption expenditure. This is why the survey is referred as HIES-LSMS. The HIES-LSMS is the only source of information of income-poverty, and the questionnaire is designed to provide poverty estimates and a set of useful social indicators that can monitor more in general human development, as well as more specific issues on key sectors, such as health, education, and energy. Table A.1 provides a summary of the contents of the LSMS questionnaire, together with the relevant sections from the HIES.

Table A.1: The HIES-LSMS questionnaire

HIES (relevant sections)		LSMS
Food expenditure and consumption	1	General information
Non-food expenditure	2	Household roster
	3	Housing
	4	Education
	5	Employment
	6	Health
	7	Fertility
	8	Migration
	9	Agriculture
	10	Livestock
	11	Non-farm enterprises
	12	Other sources of income
	13	Savings and loans
	14	Remittances
	15	Durable goods
	16	Energy

The HIES interviewed 11,232 households which were equally distributed in four quarters over the period of one year (from February 2002 to January 2003). In fact the HIES collected monthly consumption information for each household in three consecutive

months (quarters)[62]. Each month, the interviewer left a diary with the household to be used to record all types of expenditures and consumption deriving either from purchases or from own production, gifts, and barter exchanges.

The LSMS households are a subset of the household interviewed for the HIES: one third of the HIES households were contacted again and interviewed on the LSMS topics. The subset was equally distributed among the four quarters. At the planning stage the time lag between the HIES and LSMS interviews was expected to be relatively short. However, for various reasons it is on average of about 9 months, and for some households more than one year. Households interviewed in the first and second quarter of 2002 were generally re-interviewed in March and April 2003, while households of the third and fourth quarter of 2002 were re-interviewed in May, June and July of 2003. The considerable time lag between HIES and LSMS interviews was the main responsible for a considerable loss of households in the LSMS sample, households that could not be easily relocated and therefore re-interviewed. Due also to some incomplete questionnaires, the number of households that were used for the final poverty analysis is 3,308.

In conjunction with LSMS household interviews the NSO also collected a price and a community questionnaire in each selected soum. The latter collected information on the quality of infrastructure, and basic education and health services.

A.2. The sample design

The HIES, and consequently the LSMS, used the 2000 Census as sample frame. 1,248 enumerations areas were part of the sample, which is a two-stage stratified random sample. The strata, or domains of estimation, are four: Ulaanbaatar, Aimag capitals and small towns, Soum centres, and Countryside. At a first stage a number of Primary Sampling Units (PSUs) were selected from each stratum. In the selected PSUs enumerators listed all the households residing in the area[63], and in a second stage households were randomly selected from the list of households identified in that PSU (10 households were selected in urban areas and 8 households in rural areas)[64]. The use of this sampling procedure means that households living in different areas of the country have been selected with differing probabilities. Therefore, in order to obtain representative statistics for each of the strata and for Mongolia, it is necessary to use sampling weights. These weights are applied to each household and correspond to the inverse of the probability of selection, calculated taking into account the sampling strategy.

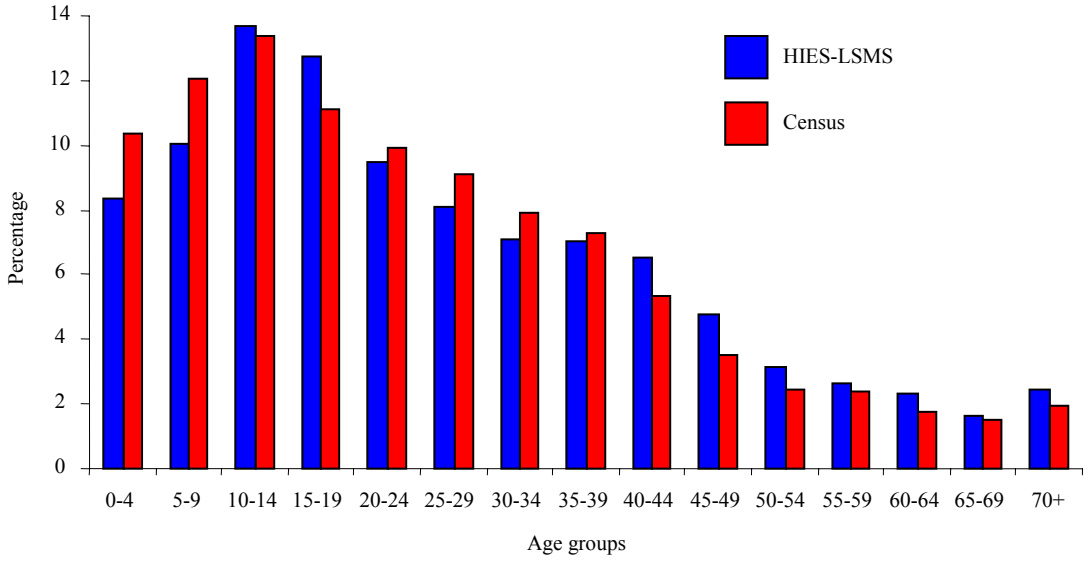
[62] An important exception is the 'first quarter' made up of February 2002, March 2002 and January 2003.
[63] However, in some instances, there are indications that the listing operations may not have been exhaustive. Probably, in some cases only officially registered households were listed. This might well explain the low proportion of migrants estimated using the LSMS sample (see section 1 of the main report).
[64] Again, in some cases there might have been some problems in the field operations, as there is evidence that in about 10% of the cases households were not selected using information from the listing operation, but some other criteria.

A.3. Data quality

If we exclude the problems encountered in some field operations in the selection of households[65], the overall data quality is to be considered of good standard. In fact, the data entry program implemented a considerable number of in-built consistency checks that alerted the data entry operator whenever some clear inconsistency was found in the data. This helped to prevent errors and raised the overall quality of the data. At the analysis stage the dataset was also checked for internal consistency and the number of corrections were overall of a limited amount: excessive expenditure values were checked against the paper questionnaire and corrected whenever a data entry mistake was found.

More generally some comparisons have been made to check whether the HIES-LSMS sample is indeed representative of Mongolia. The age-group population distribution and the sex ratio for these groups have been compared with those of the 2000 Census data (see Figure A.1, and Figure A.2). Overall discrepancies seem to be within an acceptable range. Even though the sample was not designed to provide estimates at the regional level, population shares of the HIES-LSMS sample are very close to those of the Census (see Table A.2).

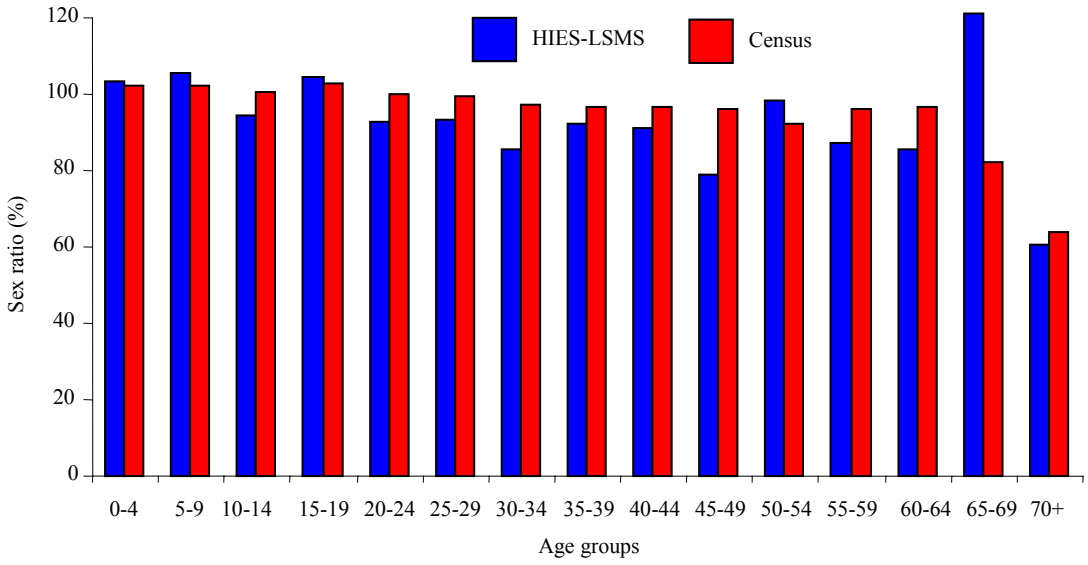
Figure A.1: Population by age group (Census and HIES-LSMS)



Source: 2002/03 HIES/LSMS and 2000 Census.

[65] Unfortunately, it is impossible to assess what is the actual implication of the non-compliance with the sample selection instruction, but one clear and quantifiable effect is definitely the reduced sample size (3,308 households from the originally planned 3,744).

Figure A.2: Sex ratio by age group (Census and HIES-LSMS)



Source: 2002/03 HIES/LSMS and 2000 Census.

Table A.2: Population by geographical region

	HIES-LSMS			Census		
	Urban	Rural	Total	Urban	Rural	Total
West	5.9	11.1	17.0	5.2	12.6	17.8
Highland	7.5	16.5	24.1	7.4	15.6	23.0
Central	7.9	11.6	19.5	8.5	10.2	18.7
East	3.9	5.4	9.2	3.6	5.0	8.5
Ulaanbaatar	30.2	0.0	30.2	32.0	0.0	32.0
National	55.4	44.6	100.0	56.6	43.4	100.0

Source: 2002/03 HIES/LSMS and 2000 Census.

B. APPENDIX B: THE CONSTRUCTION OF THE WELFARE INDICATOR

Poverty analysis requires three main elements. First, a measure of welfare that is both measurable and acceptable, and that will allow us to rank all population. Second, an appropriate poverty line to be compared against the chosen indicator in order to classify individuals in poor and non-poor. Lastly, a set of measures that combine individual welfare indicators into an aggregated poverty figure.

This appendix explains all the steps involved in the construction of the consumption measure, the derivation of the poverty line and the poverty measures. Section 1 reviews the arguments to choose consumption as the preferred welfare indicator. Section 2 describes the estimation of the nominal household consumption. Section 3 and 4 explain how to arrive to an individual measure of real consumption by correcting for differences in location, interview dates and demographic composition of households. Section 3 is concerned with the spatial and temporal price adjustment and Section 4 deals with the household composition adjustment. Section 5 clarifies the derivation of the poverty line. Finally, Section 6 presents the poverty measures used in this report.

B.1. The choice of the welfare indicator

Poverty involves multiple dimensions of deprivation, such as poor health, low human capital, limited access to infrastructure, malnutrition, lack of goods and services, inability to express political views or profess religious beliefs, etc. Each of them deserves separate attention as they summarize different components of welfare, and indeed may help policy makers to focus attention on the various facets of poverty. Nonetheless, often there is a high degree of overlapping: a malnourished person is also poorly educated and without access to health care.

Research on poverty over the last years has reached some consensus on using economic measures of living standards and these are routinely employed on poverty analysis. Moreover, income-based poverty indicators are the basis to monitor the first of the Millennium Development Goals. Although they do not cover all aspects of human welfare, they do capture a central component of any assessment of living standards. The main decision is to make the choice between income and consumption as the welfare indicator. Consumption is the preferred measure because it is likely to be a more useful and accurate measure of living standards than income. This preference of consumption over income is based on both theoretical and practical issues[66].

The first theoretical consideration is that both consumption and income can be approximations to utility, even though they are different concepts. Consumption measures what individuals have actually acquired, while income, together with assets, measures the potential claims of the person. Second, the time period over which living standards are to be measured is important. If the interest is the long-run, as in a lifetime period, both should be the same and the choice does not matter. In the short-run though, say a year, consumption is likely to be more stable than income. Households are able to

[66] See Deaton and Zaidi (2002).

smooth out their consumption, which may reflect access to credit or savings as well as information on future streams of income. Consumption is also less affected by seasonal patterns than income, for example, in agricultural economies, income is more volatile and affected by growing and harvest seasons, hence relying on that indicator might over or underestimate significantly living standards.

On the other hand, there are practical arguments to take into account. First, consumption is generally an easier concept to grasp for the respondents rather than income, especially if the latter is from self-employment or own-business activities. For instance, workers in formal sectors of the economy will have no problem in reporting accurately their main source of income i.e. their wage or salary. But people employed in informal sectors or in agriculture will have a harder time coming up with a precise measure of their income. Often is the case that household and business transactions are intertwined. Besides, as it was mentioned before, seasonal considerations are to be included to estimate an annual income figure. Finally, we also need to consider the degree of reliability of the information. Households are less reluctant to share information on consumption than on income. They may be afraid than income information will be used for different purposes, say taxes, or they may just considered income questions as too intrusive. It is also likely that household members know more about the household consumption than the level and sources of household income.

B.2. The construction of the consumption measure

Creating an aggregate of consumption is also guided by theoretical and practical considerations. First, it must be as comprehensive as possible given the available information. Omitting some components assumes that they do not contribute to people's welfare or that they do no affect the rankings of individuals. Second, market and non-market transactions are to be included, which means that purchases are not the sole component of the indicator. Third, expenditure is not consumption. For perishable goods, mostly food, it is usual to assume that all purchases are consumed. But for other goods and services, such as housing or durable goods, corrections have to be made. Lastly, the consumption aggregate comprises five main components: food, non-food, housing, durable goods and energy. The specific items included in each component and the methodology used to assign a consumption value to each of these items is outlined below.

Food component
The food component can be readily constructed by simply adding up all consumption per food item, normalized to a uniform reference period, and then aggregating all food items per household. HIES records information on food consumption at the household level for 92 items, organized in 10 categories: meat and meat products, milk and dairy products, flour and flour products, vegetables, fruits, sweets, tea, coffee and beverages, spices, alcohol and tobacco, and meals eaten away from home. The information on HIES was collected through a diary left to the household for three consecutive months, enumerators went to the household at the end of each month and based on the diaries, they filled out the questionnaires. Theoretically speaking then, the food component uses factual data from a 3-month period as opposed to the typical last week or last month recall period.

A few general principles are applied in the construction of this component. First, all possible sources of consumption should be included. This means that the food component

shall comprise not only expenditures on purchases in the market or on meals eaten away from home but also food that was own produced, received as a gift or as part of payment, or bartered. Second, ideally only food that was actually consumed, as opposed to food purchases or total home-produced food, must enter in the consumption aggregate. HIES provides a detailed account of all transactions for each food item and also information on initial and final stocks, therefore an exact measure of actual consumption can be calculated.

Third, non-purchased food items need to be valued and included in the welfare measure. HIES collects expenditures and quantities just for food purchases, whereas for all other transactions only quantities are recorded. Instead of collecting reference prices to value this consumption, unit values (expenditures divided by quantities) from purchases were calculated and used to estimate the monetary value of non-purchased items. Most food items are disaggregated enough to be regarded as relatively homogeneous within each category, however unit values are not prices, they will also reflect differences in the quality of the good. To minimize this effect, and to consider spatial and seasonal differences too, median unit values were computed at several levels: by household, cluster, aimag, strata and quarter. Hence if a household purchased a food item, the same unit value would be used to value its self-produced and in-kind consumption. If the household did not make any purchase but consumed a food item, unit values from the immediate upper level were used to estimate the value of consumption.

Non-food component

As in the case of food, non-food consumption is a simple and straightforward calculation. Again, all possible sources of consumption must be included and normalized to a common reference period. This component draws on data from both HIES and LSMS. As it was mentioned before, HIES collects information based on a diary kept by the households during 3 months. Data on an extensive range of non-food items is available, 242 items arranged in 14 different groups: clothing and footwear for men, women and children, jewelry and souvenirs, clothing materials, education, health, recreation, beauty and toilet articles and services, cultural expenses, household goods, durable goods, housing expenditures, transportation, and communication. Even tough most non-food items are too heterogeneous to try to calculate unit values, HIES does gather data on expenditures and quantities for most of them, yet only expenses were taken into account for the estimation of consumption. LSMS records information on education, health, rent of the dwelling, durable goods and energy expenses, using mostly a last year recall period. With the exception of durable goods, housing and energy, which will be dealt with later, this section covers the consumption of all the other non-food items.

Practical difficulties arise often for two reasons: the choice of items to include and the selection of the recall period. Regarding the first issue, the rule of thumb is that only items that contribute to the consumption are to be included. For instance, clothing, footwear, beauty articles and recreation are included. Others such as taxes are commonly excluded because they are not linked to higher levels of consumption, households paying more taxes are not likely to receive better public services. Capital transactions like purchases of financial assets, debt and interest payments should also be excluded. The case for lumpy or infrequent expenditures like marriages, dowries, births and funerals is more difficult. Given their sporadic nature, the ideal approach would be to spread these expenses over the years and thus smooth them out, otherwise the true level of welfare of the household will probably be overestimated. Lack of information prevents us to do that,

so they are left out from the estimation. Finally, remittances given to other households are better excluded. The rationale for this is to avoid double counting because these transfers almost certainly are already reflected in the consumption of the recipients. Hence including them would increase artificially living standards.

Two non-food categories deserve special attention: education and health. In the case of education there are three issues to consider. First, some argue that if education is an investment, it should be treated as savings and not as consumption. Benefits from attending school are distributed not simply during the school period but during all years after. Second, there are life-cycle considerations, educational expenses are concentrated in a particular time of a person's life. Say that we compare two individuals that will pay the same for their education but one is still studying while the other finished several years ago. The current student might seem as better-off but that result is just related to age and not to true differences in welfare levels. One way out would be to smooth these expenses over the whole life period. Third, we must consider the coverage in the supply of public education. If all population can benefit from free or heavily subsidized education (as it happens in Mongolia) and the decision of studying in private schools is driven by quality factors, differences in expenditures can be associated with differences in welfare levels and the case for their inclusion is stronger. Standard practice was followed and educational expenses were included in the consumption aggregate. Excluding them would make no distinction between two households with children in school age, but only one being able to send them to school.

Health expenses share some of the features presented for education. Expenditures on preventive health care could be considered as investments. Differences in access to publicly provided services may distort comparisons across households. If some sectors of the population have access to free or significantly subsidized health services, whereas others have to rely on private services, differences in expenditures do not correspond to differences in welfare. But there are other factors to take into account. First, health expenditures are habitually infrequent and lumpy over the reference period. Second, health may be seen as a "regrettable necessity", i.e. by considering in the welfare indicator the expenditures incurred by a household member that was sick, the welfare of that household is increased when in fact the opposite has happened. Third, health insurance can also distort comparisons. Insured households may register small expenditures when some member has fallen sick, while uninsured ones bigger amounts. We decided to include health expenses. As with education, excluding them would imply making no distinction between two households, both facing the same health problems, but only one paying for treatment. Besides, a positive relationship was found between health expenses and the rest of the consumption aggregate.

The second difficulty regarding non-food consumption is related with the election of the recall period. The key aspect to consider is the relationship between recall periods and frequency of purchases. Many non-food items are not purchased frequently enough to justify a weekly or monthly recall period, exceptions being for instance toiletries, beauty articles and payment of utilities. Generally recall periods are the last quarter or the last year. For most of non-food categories information comes only from HIES, thus just one option can be used, data based on a 3-month period, or in other words, a quarter. Still, a few non-food categories are available from both HIES and LSMS: mainly education and health. Aside from the fact of different recall periods, the other significant difference to keep in mind is that, for those two expenses, HIES collects expenditures at the household

level, while the LSMS at the individual level. When the reference is the household, questions are normally more aggregated than when the same topics are asked to each household member. Generally households are known to provide a more accurate account of expenses when they are asked in more detail, which would favor the use of the LSMS modules. That is indeed the case of health expenses, where LSMS records a higher level than that of HIES. For education though, expenditures are very similar. Since the LSMS modules might capture better the long-term welfare of the household, it was decided to use them.

Durable goods

Ownership of durable goods could be an important component of the welfare of the households. Given that these goods last typically for many years, the expenditure on purchases is not the proper indicator to consider. The right measure to estimate, for consumption purposes, is the stream of services that households derive from all durable goods in their possession over the relevant reference period. This flow of utility is unobservable but it can be assumed to be proportional to the value of the good. A usual procedure involves calculating depreciation rates for each type of good based on their current value and age, which in this case is provided by the LSMS along with the number of durables owned by the household[67].

The estimation of this component involved three steps. First, a selection of durable goods was done. The LSMS supplies data on 47 durable goods, ranging from home appliances to furniture. However, a third of them were excluded because they were goods used for household businesses or fell under jewelry, dwelling or "other" categories. Second, to calculate implicit depreciation rates a non-linear regression for each of the remaining goods was run with the current unit value as the dependent variable on a constant and the age of the durable. This technique allows also for the possibility of applying multiple depreciation rates, for instance a higher one when the durable good is new. Finally, the stream of consumption is computed by multiplying the current value of the good times its depreciation rate, and aggregating these consumptions by household.

Housing

Housing conditions are considered an essential part of people's living standards. Nonetheless, in most developing countries limited or nonexistent housing rental markets pose a difficult challenge for the estimation and inclusion of this component in the consumption aggregate. As in the case of durable goods, the objective is to try to measure the flow of services received by the household from occupying its dwelling. When a household rents its dwelling, and provided rental markets function well, that value would be the actual rent paid. In Mongolia, housing value for non-renters households cannot be determined based upon on information from renters because very few cases reported renting their dwellings[68]. Yet the LSMS asked households for estimates of how much their dwelling could be rented for and also how much their dwelling could be sold for. The implicit rental value can in principle be used in the consumption aggregate whenever actual rents are not reported. Implicit rents are a hypothetical concept though and the estimates may not always be credible or usable[69]. An additional complication is that

[67] Further refinements can be made using the inflation rate and the nominal interest rate.
[68] Only 24 out of the 3,308 households.
[69] Indeed, after careful inspection, some imputed rents, as well as property values, considered as outliers were dropped.

almost half of the population lives in gers, for which establishing a rent value appears to be even more difficult[70].

Two sets of hedonic housing regressions were run, one with the imputed rent value as the dependent variable and the other with the imputed value of the dwelling. The set of independent variables included characteristics of the dwelling such as main type of floor, walls, roof, number of rooms, access to water, electricity, heating, location, etc. This exercise was conducted separately for gers, detached houses and apartments. Results show that the value of the dwelling has a more consistent correlation with its characteristics and this is intuitively explained by the fact that even though households do not rent dwellings, they do buy and build them, so they report more accurately the overall value of the dwelling rather than a hypothetical rent. A second factor that favors the use of the property value is its higher response rate (more than 90% of the households reported this value compared to around 55% reporting imputed rents), which would suggest, as it was mentioned before, that households do have a better sense of the property value of their dwellings. However, the use of property values requires an additional assumption to arrive to an estimation of the services provided from housing and that is the depreciation rate of the dwelling. It was assumed that the annual rates were 3% for houses and apartments, and 6% for gers, in other words, houses and apartments will fully depreciate after 33 years and gers after 17 years. Two alternative sets of depreciation rates (2 and 5%, and 4 and 7%) produced very similar poverty measures. Therefore for the consumption aggregate, we used the estimated imputed rents derived from the imputed property values as estimates for the flow of services from housing, and otherwise actual rents if available.

Energy

The final non-food component that justified special attention was energy, meaning basically expenditures on heating and electricity. Mongolia is a country that endures extreme weather conditions, during winter temperatures can easily reach –40 degrees Celsius and in the summer 30 plus degrees. While summer may pose fewer inconveniences, winter is indeed a serious matter. Winters are long, they last on average 6 months and with usual below zero temperatures. For instance, average temperatures in January and February in the capital are –25C. This means that heating becomes a basic and essential necessity for households all over the country, and in some cases it could be a very significant and important component of their consumption.

Both surveys provide information on energy but the LSMS is the one that contains a very comprehensive and detailed module, hence it is likely to be much more accurate than the corresponding HIES section. Electricity and lighting expenses offered no problems for their inclusion in the welfare indicator. Heating was a different case. Heating is provided to households from either central or local systems or simple heating units fueled by firewood, coal or dung. While information on the former was appropriately captured, the latter presented a few complications. The questionnaire collected data on average purchases (expenditures and quantities) and collection (quantities) per winter and non-winter month for those three main sources of fuel. First, to value consumption coming from collected fuel, unit values for each one of the three main fuels were applied to their respective collected quantities. In urban areas, where most fuel is purchased, unit values

[70] Although in the definition of household expenditure the System of National Accounts recommends the inclusion of imputed rents, in the case of Mongolia several attempts to impute them failed, so that at the present time they are not included.

were estimated from actual purchases recorded in the LSMS following a similar procedure as in the case of valuing food collection. In rural areas tough, where most fuel is collected and there is no market for fuel, the same method will likely overestimate the value of consumption (Since no transactions are registered at the cluster level and very few at the aimag level, unit values are probably drawn from urban areas). Information on household fuel consumption was gathered from several aimag statistical offices and unit values were obtained from there[71]. Second, given that the recall period was the last year, we needed to make an assumption on the duration of winter and non-winter seasons in order to arrive to a monthly figure. It was assumed that each season lasts on average 6 months.

Table B.1: Maximum monthly fuel consumption during winter

	Wood (m3)	Coal (tons)	Dung (kgs)
Quantities			
Ulaanbaatar	1	1.2	800
Aimag centers	2	1.0	1,250
Soum centers	2	0.7	1,500
Countryside	2	0.4	1,800
Expenditure (Tugrug)			
Ulaanbaatar	10,000	24,000	2,000
Aimag centers	14,000	15,000	3,125
Soum centers	5,000	4,333	3,750
Countryside	2,900	2,200	4,500

Note: Households interviewed for the LSMS appear to have reported fuel consumption by calendar season, i.e. 3 months for winter and 3 months for non-winter, rather than by month. In order to arrive to a monthly figure, the estimated monthly household consumption was compared to the established maximum cut-off point. If either the quantities or expenditure reported by the household were higher than the cut-off points, the reported expenditure would be divided by three. Values for maximum expenditure were derived by multiplying the maximum quantities times their median unit value by stratum (as in valuing fuel collection, unit values in urban strata came from actual purchases recorded in the LSMS whereas those in rural strata were the same as reported in the previous footnote). Non-winter cut-off points were assumed to be 40% of those in winter. Finally, the LSMS recorded information on quantities of wood, coal and dung in kilograms, tons and cubic meters. All quantities were transformed into a single unit for each fuel using the following equivalence: one cubic meter was equivalent to 600kg of wood, 850kg of coal and 400kg of dung.

However monthly figures appeared to be too high, especially in the case of purchases. A close look at them revealed that, although questions referred to a monthly reference period, households apparently reported in many cases seasonal rather than monthly

[71] Unfortunately, this was not a proper and systematic survey covering all areas, so in order to minimize the potential bias, median unit values by stratum were considered for valuation purposes. These values were as follows: one cubic meter of wood was Tugrug 2,500 in soum centers and 1,450 in the countryside; one kilogram of dung in both strata was 2.5; and one ton of coal was 6,500 in soum centers and 5,500 in the countryside.

expenditures. An explanation for this is the fact that people often buy these fuels once or twice for the whole season and it was easier for them to report the expenditure as such[72]. The solution to this data problem consisted in establishing a reference table with average and maximum fuel consumption for winter and non-winter seasons (see Table B.1 above). These cut-off points allowed us to distinguish cases in which the household reported seasonal instead of monthly figures. Table B.1 was set in consultation with aimag statistical offices and considering the different sources of heating used by the household.

B.3. Price adjustment

Mongolia shows remarkable seasonal price differences, especially for food items, with prices in the spring (April to June) commonly 10% higher than in autumn. At the same time, across all seasons there are also regional price differences. In particular in Ulaanbaatar, prices are relatively higher than in the rest of the country. Therefore, in order to properly measure living standards, expenditure values need to be corrected for such differences using some price indexes. A price index is made of two components: prices and budget shares that attach the proper weights to prices. It follows that differences of price indices can come both from prices and consumption patterns.

The household survey provides information on budget shares as well as information on implicit prices (unit values) paid by the household. Moreover, together with the household survey the NSO also conducted a price questionnaire in soum centers collecting information on about 250 prices, and regularly collects prices for about 140 items in all aimag centers. All this provides a rich source of information, which was used to construct a Paasche price index at the cluster level. In each cluster generally between 8 and 10 households have been interviewed and prices they face as well as consumption patterns tend to be very similar.

The Paasche price index for the primary sampling unit i is obtained with the following formula:

$$p_i^P = \left[\sum_{k=1}^{n} w_{ik} \left(\frac{p_{ik}}{p_{0k}} \right)^{-1} \right]^{-1} \qquad (1)$$

where w_{ik} is the budget share of item k in the primary sampling unit i;
p_{ik} is the median price of item k in the primary sampling unit i;
p_{0k} is the national median price of item k.

Budget shares were computed from the household surveys, as well as food prices. However, it is important to note that the household survey does not collect information on prices themselves, but on implicit prices, obtained dividing expenditure by quantities purchased. Inevitably, implicit prices represent also differences in quality of the item purchased. Quality differences are generally considered acceptable for food items, but are

[72] The same situation arose in at least another recent LSMS, so it seems that there is a lesson to be learned that goes beyond the case of Mongolia.

more problematic for non-food items, which are likely to be less homogenous in nature (also questions on non-food items are less detailed than those for food ones). On the contrary, both the soum and aimag centers questionnaires collected information on actual prices and on much more well defined items. Nonetheless, the soum center price questionnaire was not always of the desired quality, some of the items show price differences that are too large, suggesting that in such cases prices of items of rather different quality were collected. This is to be expected in fragmented and incomplete markets, where the enumerator might have been compelled to substitute items that were not found.

Instead, the aimag centers prices appear to be more accurate because they are the result of a permanent activity, prices are collected in the same outlets and with more precise guidelines about the type of item for which the price is sought. Both for the soum and the aimag price questionnaire, information is not available for each household, but is representative respectively for the soum or aimag. However, it is likely that both within the same soum, and indeed the same aimag, prices of non-food items show a relatively small variation. This is because price differences for these items are mainly due to transportation costs (from Ulaanbaatar), and the soum/aimag price already captures most of such costs.

More problematic is the fact that while for food items budget shares are immediately matched with 'prices', when information on prices is taken from the price questionnaires, the correspondent budget share needs to be properly identified, and in some cases, where such correspondence does not exist, key items are considered to be representative for the budget shares of similar items. For instance, in the case of transportation expenditure, the only price that was used was the one of petrol (petroleum A-76).

The average values of the price index by quarter and analytical domains are reported in Table B.2. The index confirms that living costs in Ulaanbaatar are higher than anywhere else in the country and it also shows the seasonality effects: the index is higher in the first and second quarters and then decreases in the following quarters.

Table B.2: Cluster Paasche Index by quarter and analytical domain

	Quarter				Annual
	I	II	III	IV	average
Ulaanbaatar	1.08	1.07	1.06	1.09	1.07
Aimag centers	0.98	0.99	0.92	0.94	0.96
Soum centers	0.99	0.99	0.93	0.96	0.96
Countryside	1.03	1.06	0.92	0.94	0.98
National	1.02	1.03	0.96	0.99	1.00

Source: 2002/03 HIES/LSMS.

B.4. Household composition adjustment

The final step in constructing the welfare indicator involves going from a measure of standard of living defined at the household level to another at the individual level. Ultimately the concern is to make comparisons across individuals not households. Consumption data are collected typically at the household level (usual exceptions are health and education expenses), so computing an individual welfare measure generally is done by adjusting total household consumption by the number of people in the household, and assigning that value to each household member. Common practice to do this is to assume that all members share an equal fraction of household consumption, however as it will be explained later that is a very particular case.

Two types of adjustments have to be made to correct for differences in composition and size. The first relates to demographic composition. Household members have different needs based mainly on their age and gender, although other characteristics can also be considered. Equivalence scales are the factors that reflect those differences and are used to convert all household members into "equivalent adults". For instance, children are thought to need a fraction of what adults require, thus if a comparison is made between two households with the same total consumption and equal number of members, but one of them has children while the other is comprised entirely by adults, it would be expected that the former will have a higher individual welfare than the latter. Unfortunately there is no agreement on a consistent methodology to calculate these scales. Some are based on nutritional grounds, a child may need only 50% of the food requirements of an adult, but is not clear why the same scale should be carried over non-food items. It may very well be the case that the same child requires more in education expenses or clothing. Others are based on empirical studies of household consumption behavior, although with more analytical grounds, they do not command complete support either[73].

The second adjustment focuses in the economies of scale in consumption within the household. The motivation for this is the fact that some of the goods and services consumed by the household have characteristics of "public goods". A good is said to be public when its consumption by a member of the household does not necessarily prevent another member to consume it too. Examples of these goods could be housing and durable goods. For example, one member watching television does not preclude another for watching too. Larger households may spend less to be as well-off as smaller ones. Hence, the bigger the share in total consumption of public goods, the larger the scope for economies of scale. On the other hand, private goods cannot be shared among members, once they have been consumed by one member, no other can. Food is the classic example of a private good. It is often pointed out that in poor economies, food represents a sizeable share of the household budget and therefore in those cases there is little room for economies of scale.

Both adjustments can be implemented using the following approach:

$$AE = (A + \alpha K)^{\theta}$$

where AE is the number of adult equivalents of the household, A is the number of adults, K the number of children, α is the parameter that measures the relative cost of a child

[73] See Deaton and Muellbauer (1986) or Deaton (1997).

compared to an adult and θ represents the extent of the economies of scale[74]. Both parameters can take values between zero and one. It is been reported that in developing countries, children are relatively cheaper than adults, perhaps with values of α as low as 0.3 while in developed ones values are closer to one[75]. At the same time, in poorer economies food is often the most important good in the household consumption, and given that is a private good, the budget share of public goods is limited and so is the scope for economies of scale, perhaps with θ close to 1, whereas in richer countries around 0.75.

It was mentioned that standard practice is to use a per capita adjustment for household composition and that is also followed here. This is a special case of the above formulation, it happens when α and θ are set equal to one, so all children are treated as if their cost relative to adults were the same and there is no room for economies of scale. In other words, all members within the household consume equal shares of the total consumption and costs increase in proportion to the number of people in the household. In general, per capita measures will underestimate the welfare of households with children as well as larger households with respect to families with no kids or with a small number of members respectively. It is important then to conduct sensitivity analysis to see how robust the poverty measures and rankings are to different assumptions regarding child costs and economies of scale. Appendix C will show those results.

B.5. The poverty line

The poverty line can be defined as the monetary cost to a given person, at a given place and time, of a reference level of welfare (Ravallion, 1998). If a person does not attain that minimum level of standard of living, she will be considered as poor. But setting poverty lines could be a very controversial issue because not only people disagree on what "minimum" is but also of its eventual effects on monitoring poverty and policy making decisions.

The poverty line will be absolute because it fixes a given welfare level, or standard of living, over the domain of analysis. This guarantees that comparisons over time or across individuals will be consistent e.g. two persons with the same welfare level will be treated the same way regardless of the location where they live. Second, the reference utility level is anchored to certain attainments, generally nutritional ones, for instance, obtaining the necessary calories to have a healthy and active life. Finally, the poverty line will be set as the minimum cost of achieving that requirement.

The Cost of Basic Needs method was employed to estimate the nutrition-based poverty line. This approach calculates the cost of obtaining a consumption bundle believed to be adequate for basic consumption needs. If a person cannot afford the cost of the basket, it will be considered to be poor. First, it shall be kept in mind that the poverty status focuses on whether the person has the means to acquire the consumption bundle and not on whether its actual consumption met those requirements. Second, nutritional references are used to set the utility level but nutritional status is not the welfare indicator. Otherwise, it

[74] Actually, since the elasticity of adult equivalents with respect to "effective size" $A+\alpha K$ is θ, the measure of economies of scale is 1-θ.
[75] Deaton and Zaidi (2002).

will suffice to calculate caloric intakes and no costing would be necessary. Third, the consumption basket can be set normatively or to reflect prevailing consumption patterns. The latter is undoubtedly a better alternative. Lastly, the poverty line comprises two main components: food and non-food.

Food component

The first step in setting this component is to determine the nutritional requirements deemed to be appropriate for being healthy and able to participate in society. Clearly, it is rather difficult to arrive to a consensus on what could be considered as a healthy and active life, and hence to assign caloric requirements. Common practice is to establish 2,100 calories per person per day as the reference for energy intake. Second, a food bundle must be chosen. In theory, infinite food bundles can provide that amount of calories. One way out of this is to take into consideration the existing food consumption patterns of a reference group in the country. It was decided to use the bottom 40% of the population, ranked in terms of real per capita consumption, and obtain its average consumed food bundle. It is better to try to capture the consumption pattern of the population located in the low end of the welfare distribution because it will probably reflect better the preferences of the poor. Hence the reference group can be seen as a first guess for the poverty incidence. Third, caloric conversion factors were used to transform the food bundle into calories. The main source for these factors was the Food Research Center, which is a unit of the Ministry of Health of Mongolia. Alcohol, tobacco and meals eaten outside the household were excluded from this calculation, the former because they can be regarded as non-essential and the latter because it is very difficult to approximate caloric intakes for them. For all of the remaining food items, it was possible to assign a caloric factor. Fourth, median unit values were derived in order to price the food bundle. Unit values were computed using only transactions from the reference group. Again, this will capture more accurately the prices faced by the poor. Fifth, the average caloric intake of the food bundle was estimated, so the value of the food bundle could be scaled proportionately to achieve 2,100 calories per person per day. For instance, the average daily caloric intake of the bottom 40% of the population in Mongolia was around 1,345 calories per person and the daily value of the food bundle was Tugrug 307 per person. Hence the value of the daily poverty line is Tugrug 480 (= Tugrug 307 x 2,100 / 1,345) per person. Table B.3 shows the caloric contribution of the main food categories as well as the their respective share in the cost of the food poverty line[76].

[76] A more detailed table by food item is provided at the end of the annex.

Table B.3: Food bundle per person per day by main food groups

	Caloric intake		Value	
	Calories	Share (%)	Tugrug	Share (%)
Meat and meat products	417	20	197	41
Milk and milk products	152	7	81	17
Flour and flour products	1,304	62	127	26
Vegetables	52	2	26	5
Fruits	5	0	4	1
Candy, sugar	92	4	21	4
Tea, coffee, beverages	9	0	9	2
Seasonings	70	3	15	3
Total	2,100	100	480	100

Source: 2002/03 HIES/LSMS.

Non-food component

Setting this component of the poverty line is far from being a straightforward procedure. There is considerable disagreement on what sort of items should be included in the non-food share of the poverty line. However, it is possible to link this component with the normative judgment involved when choosing the food component. Being healthy and able to participate in society requires spending on shelter, clothing, health care, recreation, etc. A usual practice is to scale up the food poverty line to allow for basic non-food items, which can be done by dividing the food poverty line by some estimation of the budget share devoted to food. The advantage of this is that the non-food component can be based on the prevailing consumption behavior of a reference group and no pre-determined non-food bundle is needed.

The initial step is to choose a reference group. There are two ways in which this is usually done. The first is to determine the food share of the population whose food expenditures are equal to the food poverty line. The rationale behind is that if an individual spends in food what was considered appropriate for being healthy and maintaining certain activity levels, it can be assumed that this person has also acquired the necessary non-food items to support its lifestyle. The resulting poverty line is called the upper or higher poverty line. The second way to calculate the food share is to estimate it from the population whose total expenditures are equal to the food poverty line. The justification is that these people have substituted basic food needs in order to satisfy some non-food needs, therefore that amount can be interpreted as the minimum necessary allowance for non-food spending.

Two different procedures to calculate the non-food component can be proposed. One relies on econometric techniques to estimate the Engel curve, e.g. the relationship between food spending and total expenditures. Another is to use a simple non-parametric calculation as suggested in Ravallion (1998). The advantages of the latter is that no assumptions are made on the functional form of the Engel curve and that weights decline linearly around the food poverty line i.e. the closer is the household to the food poverty

line, the higher its weight. This procedure was used to determine the non-food components for the upper and lower poverty lines. For instance, in the case of the upper poverty line, first food shares are estimated from those households whose food expenditures lie within plus and minus one percent around the poverty line. The same exercise is then repeated for households lying plus and minus two percent, three percent, and up to ten percent. Second, these ten mean food shares are averaged and that will be the final food share of the poverty line. Finally, the non-food component can be easily estimated[77]. Table B.4 displays the food and non-food components of both poverty lines. The lower poverty line is applied throughout the report, while poverty estimates with the upper poverty line are presented in Table C.3.

Table B.4: Monthly poverty lines per person

	Lower poverty line		Upper poverty line	
	Tugrug	%	Tugrug	%
Food	14,386	58	14,386	44
Non-food	10,357	42	17,984	56
Total	24,743	100	32,370	100

Source: 2002/03 HIES/LSMS.

[77] For the lower poverty line, the same can be applied but taking instead households whose food spending is close to the food poverty line.

B.6. Poverty measures

Even though there is an extensive literature on poverty measurement, attention will be given to the class of poverty measures proposed by Foster, Greer and Thorbecke (1984). This family of measures can be summarized by the following equation:

$$P_\alpha = (1/n)\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^\alpha$$

where α is some non-negative parameter, z is the poverty line, y denotes consumption, i represents individuals, n is the total number of individuals in the population, and q is the number of individuals with consumptions below the poverty line.

The headcount index (α=0) gives the share of the poor in the total population, i.e. it measures the percentage of population whose consumption is below the poverty line. This is the most widely used poverty measure mainly because it is very simple to understand and easy to interpret. However, it has some limitations. It takes into account neither how close or far the consumption levels of the poor are with respect to the poverty line nor the distribution among the poor. The poverty gap (α=1) is the average consumption shortfall of the population relative to the poverty line. Since the greater the shortfall, the higher the gap, this measure overcomes the first limitation of the headcount. Finally, the severity of poverty (α=2) is sensitive to the distribution of consumption among the poor, transfers among the poor will leave unaffected the headcount or the poverty gap but will increase this measure. It applies a relatively higher weight to the largest poverty gaps.

These measures satisfy some convenient properties. First, they are able to combine individual indicators of welfare into aggregated measures of poverty. Second, they are additive in the sense that the aggregate poverty level is equal to the population-weighted sum of the poverty levels of all subgroups of the population. Third, the poverty gap and the severity of poverty satisfy the monotonicity axiom, which states that even if the number of the poor is the same, but there is a welfare reduction in a poor household, the measure of poverty should increase. And fourth, the severity of poverty will also comply with the transfer axiom: it is not only the average welfare of the poor that influences the level of poverty, but also its distribution. In particular, if there is a transfer from one poor household to a richer household, the degree of poverty should increase[78].

Finally, along the report all poverty measures are shown with their respective standard errors. Since those estimations are based on surveys and not on census data, standard errors must reflect the elements of the sample design i.e. stratification and clustering[79]. Ignoring them will risk, when carrying out poverty comparisons, mixing up true population differences with differences in sampling procedures. Appendix E shows confidence intervals and sample-design effects for the poverty measures when correlated with main variables of interest.

[78] Both the monotonicity and transfer axioms were formulated by Sen (1976).
[79] See Howes and Lanjouw (1997) for a detailed explanation.

Table B.5: Food bundle per person per day

		Unit	Calories per unit (kcals)	Daily quantity consumed (units)	Daily calories provided (kcals)	Price per unit (Tugrug)	Daily value of the food bundle a/ (Tugrug)
Meat and meat products							
101	Mutton	kg	1,083	0.054	58	918	77
102	Beef	kg	1,531	0.027	41	969	41
103	Goat	kg	1,057	0.013	13	682	14
104	Horse	kg	911	0.016	15	593	15
105	Camel	kg	1,026	0.002	2	701	2
106	Dried meat	kg	4,292	0.006	26	2,336	22
107	Pork	kg	3,554	0.000	0	1,823	0
108	Chicken	kg	1,908	0.000	0	1,586	0
109	Hunting meat	kg	1,788	0.001	2	414	1
110	Fish	kg	821	0.000	0	833	0
111	Animal interior	kg	1,058	0.012	13	429	8
112	Interior fat	kg	8,973	0.009	83	889	13
113	Sausage	kg	2,507	0.001	2	1,765	3
114	Canned meat	kg	2,250	0.000	0	1,907	0
115	Canned fish	kg	1,966	0.000	0	1,813	0
116	Egg	unit	79	0.006	1	94	1
117	Dry egg	kg	5,441	0.000	0	1,902	0
118	Other meat	kg	2,456	0.005	11	189	1
Milk and milk products							
201	Milk	lt	671	0.063	42	454	45
202	Yogurt	lt	564	0.013	7	396	8
203	Dried curds	kg	4,908	0.002	12	1,462	6
204	Horse milk	lt	487	0.004	2	542	4
205	Cheese	kg	4,733	0.001	4	954	1
206	Skim	kg	5,788	0.003	15	2,377	9
207	Cream	kg	2,495	0.000	1	1,347	1
208	Butter	kg	5,323	0.002	9	1,488	4
209	Other diary products	kg	2,566	0.000	1	859	0
210	Dried milk	kg	3,293	0.001	2	2,897	2
211	Condensed milk	lt	4,850	0.001	3	668	1
212	Other	kg	3,244	0.000	0	689	0
Flour and flour products							
301	Flour, highest grade	kg	3,617	0.014	50	305	7
302	Flour, 1st grade	kg	3,250	0.126	410	291	57
303	Flour, 2nd grade	kg	3,474	0.056	194	254	22
304	Other flour, barley	kg	3,742	0.001	3	414	1
305	Pasta	kg	3,732	0.002	9	669	2
306	Bread	670 gr	1,590	0.030	48	240	11
307	Bakery	kg	4,050	0.004	18	752	5
308	Biscuit	kg	2,508	0.001	1	1,371	1
309	Millet	kg	3,513	0.002	8	360	1
310	Rice	kg	3,447	0.026	91	421	17
311	Other grain	kg	3,455	0.000	1	735	0
312	Other cakes, etc	kg	3,097	0.000	0	3,122	1

(table continues on following page)

Table B.4: Food bundle per person per day

		Unit	Calories per unit (kcals)	Daily quantity consumed (units)	Daily calories provided (kcals)	Price per unit (Tugrug)	Daily value of the food bundle a/ (Tugrug)
Vegetables							
401	Potato	kg	877	0.031	27	249	12
402	Cabbage	kg	140	0.004	1	359	2
403	Carrot	kg	224	0.003	1	398	2
404	Turnip	kg	208	0.004	1	449	3
405	Onion	kg	336	0.005	2	448	4
406	Garlic	kg	1,108	0.000	0	959	0
407	Tomato	kg	260	0.000	0	939	0
408	Cucumber	kg	142	0.000	0	1,006	1
409	Noodles made of potato flour	kg	3,272	0.000	1	878	1
410	Pickled cucumber	kg	164	0.000	0	1,410	0
411	Canned vegetable salad	kg	1,121	0.000	0	1,377	1
412	Other	kg	714	0.000	0	1,383	0
Fruits							
501	Apple	kg	468	0.003	1	540	2
502	Grape	kg	1,812	0.000	1	1,151	1
503	Dried fruit	kg	2,721	0.000	0	1,829	0
504	Jam	kg	2,867	0.000	0	1,322	0
505	Stewed fruit	kg	814	0.000	0	1,715	0
506	Peanuts	kg	5,980	0.000	1	1,376	0
507	Fruit	kg	400	0.000	0	1,143	0
508	Other fruit	kg	504	0.000	0	920	0
Candy, sugar							
601	Sugar	kg	3,992	0.011	43	610	10
602	Lump sugar	kg	3,996	0.001	2	1,123	1
603	Caramel, domestic	kg	3,697	0.001	5	1,538	3
604	Caramel, imported	kg	3,837	0.002	7	1,641	5
605	Chocolate	kg	5,481	0.000	2	3,006	2
606	Other marmalades	kg	2,644	0.000	0	1,544	0
Tea, coffee, beverages							
701	Green tea	kg	1,076	0.004	4	1,090	6
702	Tea	gr	1	0.033	0	6	0
703	Coffee	gr	1	0.019	0	8	0
704	Beverage	lt	343	0.004	1	358	2
705	Fruit juice	lt	488	0.000	0	1,019	0
706	Other beverages	lt	869	0.000	0	442	0
Seasonings							
901	Salt	kg	0	0.012	0	189	4
902	Vegetable oil	lt	8,991	0.005	42	1,170	9
903	Mayonnaise	kg	6,258	0.000	1	2,654	1
904	Vinegar, sauce	gr	1	0.770	1	1	1
905	Other	gr	4	0.097	0	5	1
TOTAL PER DAY					1,345		480

a/ Values are already scaled up to achieve 2,100 calories per person per day i.e. the daily calories provided times the price per calory (price per unit divided by calories per unit) times the scaling caloric factor (2100/1358).

Source: 2002/03 HIES/LSMS.

C. APPENDIX C: SENSITIVITY OF POVERTY ESTIMATES TO CRUCIAL HYPOTHESES

As discussed in Appendix B in the process of estimating poverty, a number of assumptions and estimations have been made. Since some of these adjustments involve an unavoidable degree of arbitrariness, it is important to test how sensitive the final results are to these assumptions. In particular, we want to analyze the effect of:

1) Different hypotheses of economies of size and equivalence scale;
2) The exclusion of heating and imputed rents from the consumption aggregate.

C.1. Alternative hypotheses of equivalence scale and economies of size

As discussed in section IV of appendix B, it is important to test whether the poverty profile is very sensitive to the different possible adjustments of household size, taking into account equivalence scales and economies of size. The formula presented earlier was as follows:

$$AE = (A + \alpha K)^{\theta}$$

However, it is also possible to consider the same effect considering a single parameter and express the adult equivalent household size as follows:

$$AE = (\text{Household size})^{\alpha}$$

Both higher economies of size and larger differences in needs between people of different age (equivalence scale parameters) will have the effect of reducing the parameter α. This approach has been used by Lanjouw, Milanovic and Paternostro (1998), and it is applied here to test for the effect of different values of α on the ranking of the main demographic groups, where it is likely that different adjustments might have an impact. In fact, these tests want to assess whether different adjustments of household size affect the conclusions reached in generating the poverty profile of relevant population groups. These groups are those with high household size and with members that might have consumption needs lower than adults, namely children and elderly people.

The source of potential economies of size is mainly related to the share of consumption expenditure for public goods or quasi-public goods: housing (rent), durables, and utilities. These consumption subgroups represent respectively 5%, 1% and 9% of total consumption, altogether 15% of total consumption. In Mongolia it is also likely that different needs of children versus adults may be important. In fact, education is still subsidized and it is reasonable to believe that the requirement for children is lower than the one for adults for what concerns food, and other non-food expenditure. Taking all this into consideration, reasonable values of α are unlikely to be below 0.5.

The groups of households considered in this analysis are:

1) Elderly households (households composed exclusively by elderly people: women more than 54 and men more than 59);
2) Households with high child ratio (more than average number of children, children are those aged less than 16);

3) Female-headed households;
4) Households with high dependency ratio (higher than average dependency ratio);
5) Households with no children;
6) Households with 1 child;
7) Households with 2 children;
8) Households with 3 children or more.

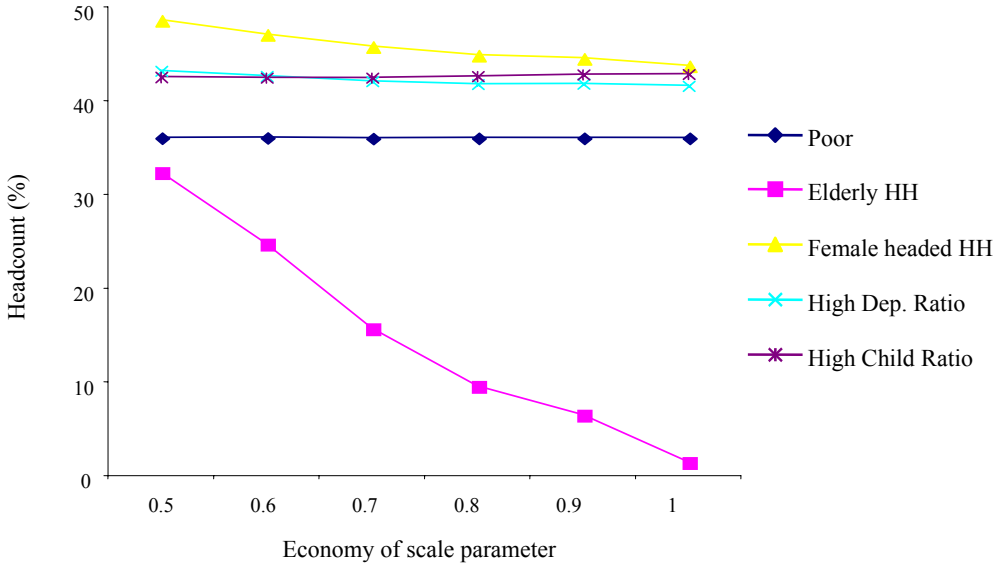
These groups of households are used to evaluate the changes in their relative levels of poverty when giving different values to α, but keeping the overall headcount ratio equal to 36%. Table C.1 shows the results of such analysis considering values of α from 0.5 to 1. Although as α decreases, the head count increases significantly for elderly households and households with no children, poverty rankings of these groups remain the same. Moreover, it is worth to remember that households with only elderly people represent less than 2% of the population. This result suggests that poverty estimates within these groups are no particularly sensitive to the different values of α, at least within the considered range. The only exception is female-headed households, where as α decreases, they become relatively poorer than households with high dependency ratio and high child ratio. These results are reported also in two graphs Figure C.1 and Figure C.2.

Table C.1: Headcount within different groups of households making different assumptions on the extent of economies of scale

	α = 0.5	α = 0.6	α = 0.7	α = 0.8	α = 0.9	α = 1	% of pop.
Poor	36.1	36.1	36.1	36.1	36.1	36.1	
Elderly households	32.4	24.8	15.7	9.6	6.5	1.5	1.7
Female-headed households	48.6	47.1	45.8	44.9	44.6	43.8	14.2
High dependency ratio	43.2	42.7	42.1	41.8	41.8	41.6	51.5
High child ratio	42.6	42.5	42.5	42.6	42.8	42.9	62.0
No. children	23.1	20.6	18.5	16.7	15.8	14.7	17.1
1 child	27.1	27.2	26.4	25.9	25.0	24.0	25.4
2 children	34.8	34.2	33.8	33.7	33.1	32.9	28.5
3+ children	53.0	54.9	57.1	58.8	60.7	62.5	29.0
Av. hhsize for the poor	4.6	4.8	5.0	5.2	5.3	5.4	
Av. hhsize for the non-poor	4.2	4.1	4.0	3.9	3.9	3.9	
% of children in poverty	42.7	43.0	43.1	43.4	43.7	43.8	
% of elderly in poverty	32.0	29.5	26.8	24.2	23.3	21.5	

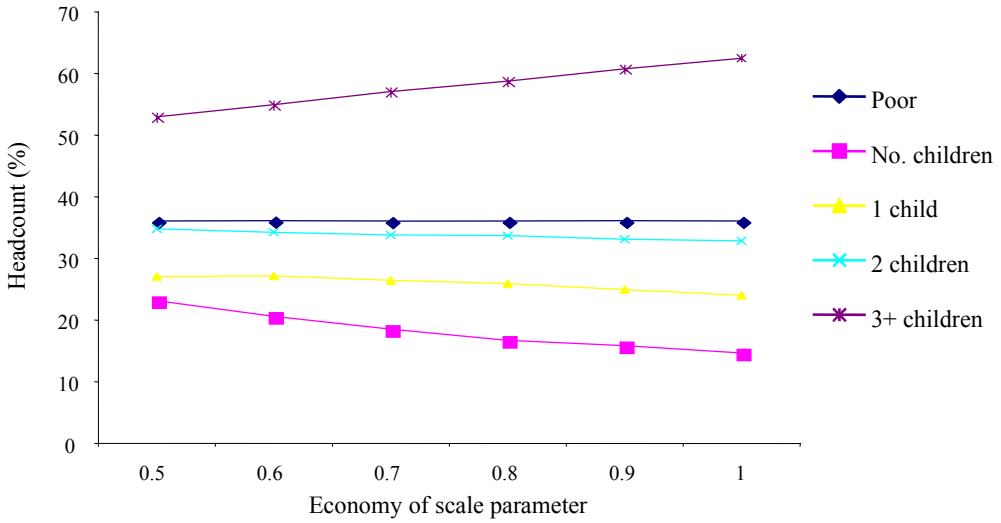
Source: 2002/03 HIES/LSMS.

Figure C.1: Headcount within different groups of households making different assumptions on the extent of economies of scale



Source: 2002/03 HIES/LSMS.

Figure C.2: Headcount within different groups of households making different assumptions on the extent of economies of scale



Source: 2002/03 HIES/LSMS.

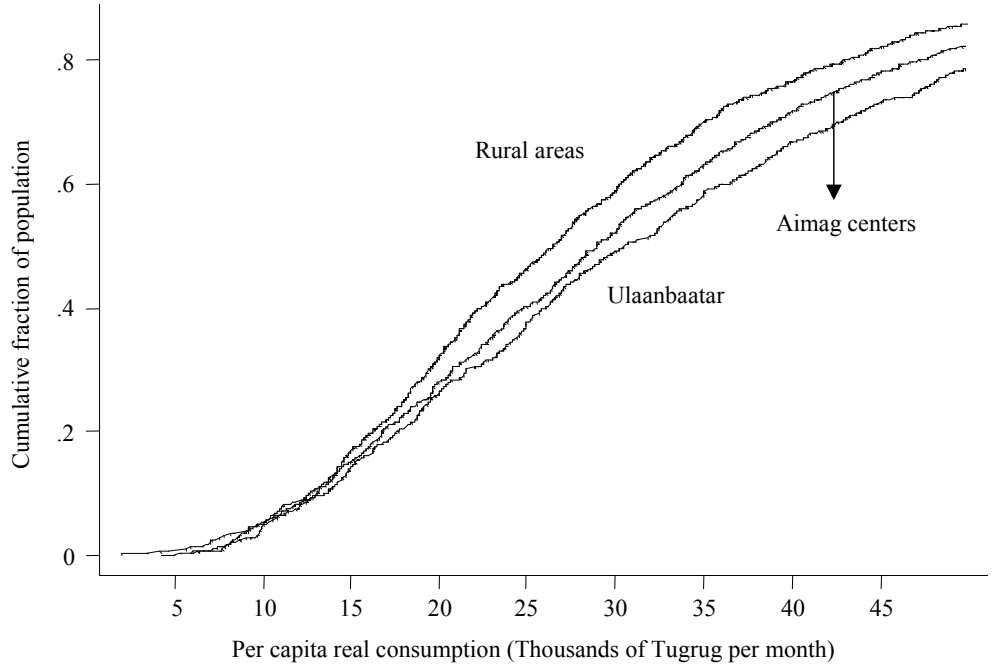
The same analysis can be repeated considering other groups based on other characteristics, for instance geographical areas, but in this case rankings are even less affected by different hypothesis of α, because there are no substantial differences in demographic characteristics between the various geographical areas (strata and regions).

C.2. The inclusion of rent and heating expenses in the consumption aggregate

The inclusion of imputed rents as well as heating expenses (central heating, wood, coal, and dung) required elaborated analysis, and although it is believed that the best use of the available data was made, it is important to check how the final results are sensitive to a consumption aggregate that excludes both rent and heating expenses. The exclusion of these two consumption components is because there are some important inter-linkages between the two: the imputed rent seems to be strongly associated with the heating system the dwelling uses.

The population rankings to test are that of the main analytical domains. In fact, it is between urban (Ulaanbaatar and aimag centers) and rural areas (soum centers and countryside) that the main differences in rent and heating expenditures are likely to be. In order to see whether the rankings between these areas change when excluding rent and heating expenditures from the consumption aggregate, the same technique explained in section 2 is used to plot on the same graph three cumulative distribution functions: one for Ulaanbaatar, one for aimag centers and one for rural areas. As shown in Figure C.3 urban areas are still better-off than rural areas, although the gap between the two is reduced considerably. Also the gap between Ulaanbaatar and aimag centers now is very small for a good part of the lower part of the distribution.

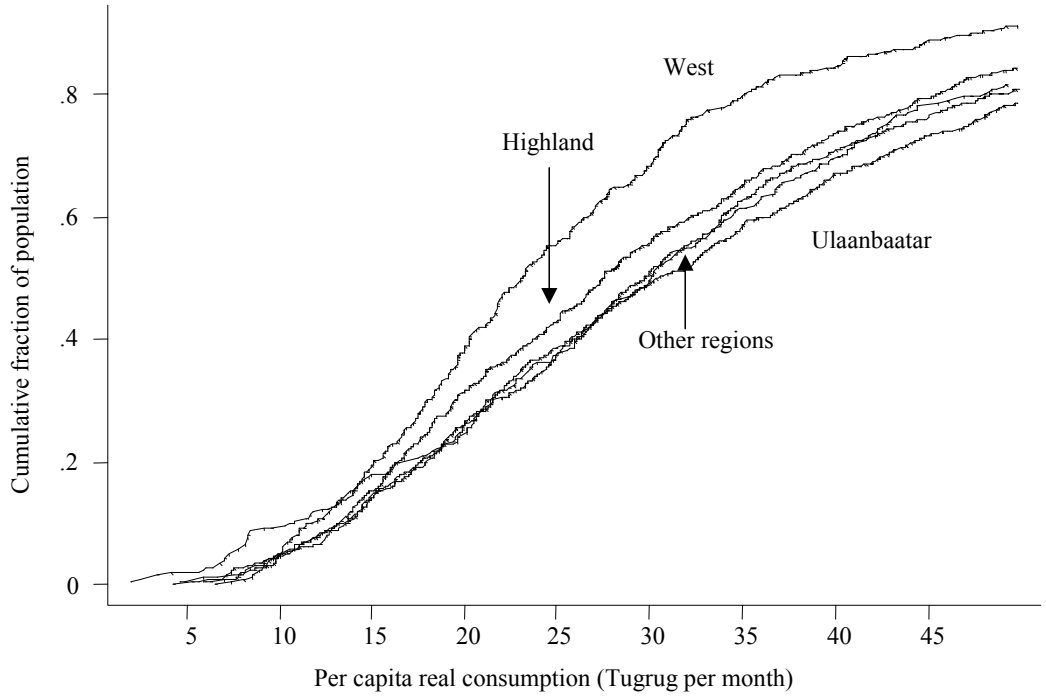
Figure C.3: Cumulative distribution functions of urban and rural areas (excluding rents and heating costs)



Source: 2002/03 HIES/LSMS.

The same analysis is conducted for the main geographical regions. Looking at the cumulative distribution functions in Figure C.4, the West is still the worse-off region followed by the Highland, but for the other regions, the curves intersect in various points and there is not a clear trend that emerges. Contrary with the result presented in section 2, when rent and central heating expenditure are excluded Ulaanbaatar is no longer better-off than the rest of the Central region, and the East. Therefore, the finding that Ulaanbaatar is the least poor depends on the inclusion of rent and heating expenditure in the consumption aggregate.

Figure C.4: Cumulative distribution functions by region (excluding rent and heating costs)



Source: 2002/03 HIES/LSMS.

The conclusion is that the geographical poverty rankings are sensitive to the treatment of heating expenditure and rent. Although urban areas remain better-off than rural ones, the differences in welfare levels between the two are sensibly reduced, and Ulaanbaatar is no longer in-equivocally the richest area of the country. Poverty estimates with and without rent and heating are shown in Tables C.2 and C.3, which also present estimations with the lower and upper poverty line.

Table C.2: Lower poverty estimates

	All components			Excluding rent and heating		
	Headcount	Poverty Gap	Severity	Headcount	Poverty Gap	Severity
National	36.1	11.0	4.7	41.0	13.4	6.0
	(1.4)	(0.6)	(0.3)	(1.5)	(0.7)	(0.4)
Analytical domain						
Ulaanbaatar	27.3	8.1	3.3	35.8	11.8	5.3
	(2.6)	(1.0)	(0.5)	(2.8)	(1.2)	(0.7)
Aimag centers	33.9	10.5	4.7	39.6	13.2	6.2
	(2.2)	(1.0)	(0.7)	(2.2)	(1.1)	(0.7)
Soum centers	44.5	14.4	6.4	46.2	16.0	7.4
	(3.0)	(1.5)	(0.9)	(2.9)	(1.6)	(1.0)
Countryside	42.7	12.6	5.1	44.8	13.8	5.8
	(3.3)	(1.3)	(0.7)	(3.4)	(1.4)	(0.8)
Region						
West	51.1	14.6	5.7	55.3	17.0	7.2
	(3.5)	(1.3)	(0.7)	(3.5)	(1.5)	(0.8)
Highland	38.7	12.3	5.2	42.0	13.8	6.1
	(2.9)	(1.3)	(0.7)	(3.0)	(1.3)	(0.8)
Central a/	34.4	10.1	4.3	37.7	12.0	5.3
	(3.0)	(1.4)	(0.8)	(3.0)	(1.4)	(0.9)
East	34.5	12.4	6.6	36.1	13.9	7.6
	(4.4)	(2.3)	(1.6)	(4.3)	(2.4)	(1.7)
Location						
Urban	30.3	9.2	4.0	37.6	12.5	5.7
	(1.7)	(0.7)	(0.4)	(1.8)	(0.8)	(0.5)
Rural	43.4	13.2	5.6	45.3	14.6	6.4
	(2.4)	(1.0)	(0.5)	(2.4)	(1.1)	(0.6)
Memorandum items:						
Bottom 40%						
Calories	1,345			1,337		
National poverty line						
Food	14,386			14,323		
Non-food	10,357			10,245		
Total	24,743			24,568		

a/ Excludes Ulaanbaatar.

Note: Standard errors taking into account the survey design are shown in parentheses.

Source: 2002/03 HIES/LSMS.

Table C.3: Upper poverty estimates

	All components			Excluding rent and heating		
	Headcount	Poverty Gap	Severity	Headcount	Poverty Gap	Severity
National	53.6	19.0	9.0	52.9	18.9	9.1
	(1.5)	(0.8)	(0.5)	(1.5)	(0.8)	(0.5)
Analytical domain						
Ulaanbaatar	42.4	14.5	6.7	47.9	16.8	8.0
	(3.1)	(1.3)	(0.8)	(2.8)	(1.4)	(0.8)
Aimag centers	51.5	18.1	8.8	51.0	18.4	9.1
	(2.2)	(1.2)	(0.8)	(2.2)	(1.2)	(0.9)
Soum centers	61.2	23.1	11.6	55.9	21.7	10.9
	(2.7)	(1.8)	(1.2)	(2.9)	(1.8)	(1.2)
Countryside	62.9	22.2	10.2	58.4	20.0	9.1
	(3.5)	(1.7)	(1.0)	(3.4)	(1.6)	(1.0)
Region						
West	71.1	25.5	11.8	66.6	24.2	11.2
	(3.0)	(1.7)	(1.0)	(3.2)	(1.7)	(1.0)
Highland	56.7	20.8	10.0	54.7	19.5	9.3
	(3.3)	(1.6)	(1.0)	(3.2)	(1.6)	(1.0)
Central a/	52.3	17.8	8.4	49.1	17.1	8.1
	(2.8)	(1.6)	(1.1)	(2.7)	(1.6)	(1.1)
East	52.3	19.5	10.5	48.1	18.5	10.1
	(4.9)	(2.6)	(1.9)	(4.9)	(2.6)	(1.9)
Location						
Urban	46.5	16.1	7.6	49.3	17.5	8.5
	(1.9)	(0.9)	(0.6)	(1.8)	(0.9)	(0.6)
Rural	62.3	22.5	10.8	57.5	20.6	9.8
	(2.4)	(1.2)	(0.8)	(2.4)	(1.2)	(0.8)
Memorandum items:						
Bottom 40%						
Calories	1,345			1,337		
National poverty line						
Food	14,386			14,323		
Non-food	17,984			15,029		
Total	32,370			29,352		

a/ Excludes Ulaanbaatar.

Note: Standard errors taking into account the survey design are shown in parentheses.

Source: 2002/03 HIES/LSMS.

D. APPENDIX D: ADDITIONAL STATISTICAL TABLES

Table D.1: Inequality measures

	Gini coefficient	Theil index
National	0.329	0.183
Urban	0.331	0.185
Rural	0.313	0.165
Region		
West	0.306	0.166
Highland	0.320	0.171
Central a/	0.314	0.164
East	0.317	0.173
Analytical domain		
Ulaanbaatar	0.332	0.187
Aimag centers	0.324	0.175
Soum centers	0.318	0.170
Countryside	0.309	0.162

a/ Excludes Ulaanbaatar.
Source: 2002/03 HIES/LSMS.

Table D.2: Decomposition of inequality between and within various population groups (Theil index)

	Within	Between	Total
Urban/rural areas	96.7	3.3	100.0
Geographical regions	95.6	4.4	100.0
Strata (Ulaanbaatar, aimag centers, soum centers, countryside)	95.8	4.2	100.0
Dwelling type (house, apartment, ger)	92.4	7.6	100.0
Water source	87.5	12.5	100.0
Toilet (inside, outside)	90.5	9.5	100.0
Whether household has telephone	87.4	12.6	100.0
Heating system (central, wood, coal, other)	89.6	10.4	100.0
Household size	77.1	22.9	100.0
Age of household head (15-29, 30-49, 50+)	98.8	1.2	100.0
Sex of household head	100.0	0.0	100.0
Education of household head	90.4	9.6	100.0
Sector of employment of household head	97.0	3.0	100.0

Source: 2002/03 HIES/LSMS.

Table D.3: Per capita daily caloric intake by main food groups

	National	Urban	Rural	Analytical domains				Geographical regions			
				Ulaanbaatar	Aimag centers	Soum centers	Countryside	West	Highland	Central a/	East
Caloric intake											
Meat and meat products	379	302	474	270	342	408	512	452	434	385	445
Milk and dairy products	213	127	320	122	132	202	388	155	335	186	354
Flour and flour products	1,062	1,072	1,048	1,023	1,132	1,031	1,058	1,089	1,079	1,096	1,020
Vegetables	60	82	32	89	74	45	25	47	35	59	56
Fruits	10	14	6	15	12	7	5	6	7	11	10
Candy, sugar	106	109	102	104	115	102	103	98	114	108	103
Tea, coffee, beverages	10	12	8	13	11	9	8	10	8	10	8
Spices	81	112	42	122	99	63	31	35	58	94	62
Total	1,921	1,830	2,034	1,758	1,916	1,865	2,129	1,891	2,071	1,948	2,058
Shares											
Meat and meat products	20	17	23	15	18	22	24	24	21	20	22
Milk and dairy products	11	7	16	7	7	11	18	8	16	10	17
Flour and flour products	55	59	52	58	59	55	50	58	52	56	50
Vegetables	3	4	2	5	4	2	1	2	2	3	3
Fruits	1	1	0	1	1	0	0	0	0	1	1
Candy, sugar	6	6	5	6	6	5	5	5	6	6	5
Tea, coffee, beverages	1	1	0	1	1	0	0	1	0	1	0
Spices	4	6	2	7	5	3	1	2	3	5	3
Total	100	100	100	100	100	100	100	100	100	100	100

a/ Excludes Ulaanbaatar.

Source: 2002/03 HIES/LSMS.

Table D.4: Per capita monthly consumption by poverty status and urban-rural divide

	Total		Urban		Rural	
	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor
Consumption						
Food	20,504	9,002	18,636	7,912	23,366	9,949
Alcohol and tobacco	1,767	557	1,851	531	1,637	579
Education	3,284	1,166	3,986	1,400	2,209	962
Health	2,561	782	2,813	801	2,176	765
Durable goods 1/	574	120	709	132	369	110
Rent 2/	2,722	586	4,060	832	671	372
Heating 3/	1,349	934	1,739	1,429	751	504
Utilities 4/	2,730	927	3,748	1,196	1,171	695
Clothing	6,206	1,684	6,308	1,460	6,049	1,878
Transportation and communication	2,659	534	2,945	602	2,220	476
Others 5/	3,434	921	3,591	929	3,194	915
Total	47,790	17,214	50,386	17,224	43,813	17,205
Shares						
Food	43	52	37	46	53	58
Alcohol and tobacco	4	3	4	3	4	3
Education	7	7	8	8	5	6
Health	5	5	6	5	5	4
Durable goods 1/	1	1	1	1	1	1
Rent 2/	6	3	8	5	2	2
Heating 3/	3	5	3	8	2	3
Utilities 4/	6	5	7	7	3	4
Clothing	13	10	13	8	14	11
Transportation and communication	6	3	6	3	5	3
Others 5/	7	5	7	5	7	5
Total	100	100	100	100	100	100

1/ Estimation of the monetary value of the consumption derived from the use of durable goods.

2/ Estimation of the monetary value of the consumption derived from occupying the dwelling. If the household rents its dwelling, the actual rent will be included instead of the imputed rent.

3/ Includes central and local heating, firewood, coal and dung. *4/ Includes electricity and lighting, water and telephone.*

5/ Includes recreation, entertaiment, beauty and toilet articles, and household utensils.

Source: 2002/03 HIES/LSMS.

Table D.5: Per capita monthly consumption by poverty status and analytical domain

	Total		Ulaanbaatar		Aimag centers		Soum centers		Countryside	
	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor
Consumption										
Food	20,504	9,002	18,426	7,612	18,911	8,200	19,849	8,780	25,310	10,644
Alcohol and tobacco	1,767	557	1,861	544	1,839	518	1,819	617	1,536	557
Education	3,284	1,166	4,253	1,418	3,635	1,384	3,720	1,269	1,374	780
Health	2,561	782	2,657	806	3,018	797	3,130	843	1,649	719
Durable goods 1/	574	120	774	140	623	125	426	111	337	110
Rent 2/	2,722	586	5,915	1,029	1,622	644	664	390	675	361
Heating 3/	1,349	934	1,756	1,669	1,717	1,199	942	606	645	444
Utilities 4/	2,730	927	4,392	1,292	2,901	1,104	1,671	947	894	545
Clothing	6,206	1,684	5,476	1,161	7,402	1,749	6,402	1,704	5,854	1,982
Transportation and communication	2,659	534	3,481	866	2,241	347	2,266	461	2,194	484
Others 5/	3,434	921	3,615	852	3,560	1,002	3,132	1,030	3,229	846
Total	47,790	17,214	52,605	17,387	47,468	17,066	44,022	16,758	43,698	17,471
Shares										
Food	43	52	35	44	40	48	45	52	58	61
Alcohol and tobacco	4	3	4	3	4	3	4	4	4	3
Education	7	7	8	8	8	8	8	8	3	4
Health	5	5	5	5	6	5	7	5	4	4
Durable goods 1/	1	1	1	1	1	1	1	1	1	1
Rent 2/	6	3	11	6	3	4	2	2	2	2
Heating 3/	3	5	3	10	4	7	2	4	1	3
Utilities 4/	6	5	8	7	6	6	4	6	2	3
Clothing	13	10	10	7	16	10	15	10	13	11
Transportation and communication	6	3	7	5	5	2	5	3	5	3
Others 5/	7	5	7	5	8	6	7	6	7	5
Total	100	100	100	100	100	100	100	100	100	100

1/ Estimation of the monetary value of the consumption derived from the use of durable goods.

2/ Estimation of the monetary value of the consumption derived from occupying the dwelling. If the household rents its dwelling, the actual rent will be included instead of the imputed rent.

3/ Includes central and local heating, firewood, coal and dung. *4/ Includes electricity and lighting, water and telephone.*

5/ Includes recreation, entertaiment, beauty and toilet articles, and household utensils.

Source: 2002/03 HIES/LSMS.

Table D.6: Per capita monthly consumption by poverty status and region

	Total		West		Highland		Central		East		Ulaanbaatar	
	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor
Consumption												
Food	20,504	9,002	19,097	9,521	22,717	9,664	20,966	9,183	23,594	8,870	18,426	7,612
Alcohol and tobacco	1,767	557	1,662	574	1,825	588	1,764	601	1,432	357	1,861	544
Education	3,284	1,166	3,071	1,005	2,633	977	3,006	1,398	2,237	1,016	4,253	1,418
Health	2,561	782	2,390	841	2,119	645	3,216	908	2,143	692	2,657	806
Durable goods 1/	574	120	485	170	498	104	440	67	444	95	774	140
Rent 2/	2,722	586	759	387	1,005	483	1,327	509	971	444	5,915	1,029
Heating 3/	1,349	934	1,411	840	941	552	1,191	804	1,115	682	1,756	1,669
Utilities 4/	2,730	927	1,815	760	1,528	742	2,214	958	1,980	921	4,392	1,292
Clothing	6,206	1,684	6,274	2,103	6,773	1,773	6,636	1,679	6,460	1,650	5,476	1,161
Transportation and communication	2,659	534	2,295	595	1,955	330	2,800	445	1,594	296	3,481	866
Others 5/	3,434	921	3,033	882	3,421	1,041	3,348	917	3,548	866	3,615	852
Total	47,790	17,214	42,291	17,679	45,415	16,899	46,909	17,469	45,519	15,889	52,605	17,387
Shares												
Food	43	52	45	54	50	57	45	53	52	56	35	44
Alcohol and tobacco	4	3	4	3	4	3	4	3	3	2	4	3
Education	7	7	7	6	6	6	6	8	5	6	8	8
Health	5	5	6	5	5	4	7	5	5	4	5	5
Durable goods 1/	1	1	1	1	1	1	1	0	1	1	1	1
Rent 2/	6	3	2	2	2	3	3	3	2	3	11	6
Heating 3/	3	5	3	5	2	3	3	5	2	4	3	10
Utilities 4/	6	5	4	4	3	4	5	5	4	6	8	7
Clothing	13	10	15	12	15	10	14	10	14	10	10	7
Transportation and communication	6	3	5	3	4	2	6	3	4	2	7	5
Others 5/	7	5	7	5	8	6	7	5	8	5	7	5
Total	100	100	100	100	100	100	100	100	100	100	100	100

1/ Estimation of the monetary value of the consumption derived from the use of durable goods.

2/ Estimation of the monetary value of the consumption derived from occupying the dwelling. If the household rents its dwelling, the actual rent will be included instead of the imputed rent.

3/ Includes central and local heating, firewood, coal and dung. *4/ Includes electricity and lighting, water and telephone.*

5/ Includes recreation, entertaiment, beauty and toilet articles, and household utensils.

Source: 2002/03 HIES/LSMS.

Table D.7: Per capita monthly consumption by decile

	Total	Urban	Rural	Ulaanbaatar	Aimag centers	Soum centers	Countryside
Poorest	10,991	11,422	10,589	12,333	10,456	9,646	11,257
II	16,481	17,750	15,375	18,618	17,007	14,651	15,820
III	20,407	22,356	18,800	23,607	21,173	18,185	19,234
IV	24,288	26,961	21,819	28,450	25,321	21,435	22,002
V	28,589	31,526	25,537	33,648	29,602	25,567	25,552
VI	33,150	36,691	29,368	39,107	34,162	30,086	29,002
VII	38,559	42,799	33,894	46,449	39,277	34,222	33,647
VIII	46,353	51,603	40,144	55,552	46,210	39,799	40,415
IX	58,201	63,596	50,343	67,168	58,360	48,692	51,360
Richest	90,533	99,171	77,106	105,726	90,650	77,064	77,366
Total	36,747	40,348	32,269	43,002	37,175	31,881	32,491

Note: Deciles were constructed separately for each geographical domain. They comprise 10% of the population of the respective region.
Source: 2002/03 HIES/LSMS.

Table D.8: Share of total consumption by decile

	Total	Urban	Rural	Ulaanbaatar	Aimag centers	Soum centers	Countryside
Poorest	3.0	2.8	3.3	2.9	2.8	3.0	3.6
II	4.5	4.4	4.8	4.4	4.7	4.6	4.8
III	5.5	5.5	5.8	5.5	5.6	5.8	6.0
IV	6.6	6.6	6.8	6.5	6.9	6.5	6.7
V	7.8	7.9	7.8	7.9	7.9	8.2	7.8
VI	9.0	9.1	9.1	9.1	9.3	9.3	8.9
VII	10.5	10.7	10.6	10.9	10.4	10.8	10.4
VIII	12.6	12.8	12.4	12.7	12.5	12.5	12.4
IX	15.8	15.7	15.6	15.7	15.7	15.2	16.0
Richest	24.6	24.5	23.8	24.5	24.3	24.1	23.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Deciles were constructed separately for each geographical domain. They comprise 10% of the population of the respective region.
Source: 2002/03 HIES/LSMS.

Table D.9: Poverty incidence by characteristics of the household head and urban-rural divide

	Headcount			Share of population			Share of poor		
	Urban	Rural	National	Urban	Rural	National	Urban	Rural	National
Gender									
Male	27.9	42.8	34.8	82.5	89.9	85.8	75.9	88.7	82.8
Female	41.6	48.4	43.8	17.5	10.1	14.2	24.1	11.3	17.2
Age									
Less than 30 years	23.1	29.3	27.0	7.6	15.9	11.3	5.8	10.7	8.4
Between 30 and 49	32.4	49.4	40.2	56.6	60.3	58.2	60.5	68.7	64.9
50 years or more	28.4	37.6	31.6	35.8	23.8	30.5	33.7	20.6	26.7
Educational attainment									
None	52.3	43.8	45.8	1.8	7.3	4.2	3.1	7.4	5.4
Primary	48.1	44.5	45.6	8.1	21.7	14.2	12.9	22.2	17.9
Secondary 8th grade	47.7	43.8	45.5	20.9	35.6	27.5	33.0	35.9	34.6
Complete secondary	29.2	44.8	34.9	21.7	15.4	18.8	20.9	15.9	18.2
Vocational	34.9	50.2	40.7	11.4	8.7	10.2	13.2	10.1	11.5
Higher diploma	19.6	34.4	23.4	18.3	7.9	13.6	11.8	6.2	8.8
University	8.8	29.0	11.6	17.8	3.6	11.5	5.2	2.4	3.7
Migration									
Migrant	29.0	38.7	31.2	17.2	6.1	12.3	16.5	5.5	10.6
Non-migrant	30.5	43.7	36.8	82.8	93.9	87.7	83.5	94.5	89.4
Employment									
Labor force participation									
Employed	25.5	41.4	33.6	62.9	82.1	71.5	53.0	78.3	66.5
Unemployed	43.8	60.1	48.7	3.8	2.0	3.0	5.5	2.8	4.0
Out of labor force	37.8	51.7	41.6	33.3	15.9	25.5	41.6	18.9	29.4
Among those employed,									
Economic activity									
Agriculture	40.6	41.0	41.0	5.6	60.7	30.2	7.5	57.4	34.2
Industry	28.2	57.5	33.2	13.1	3.4	8.8	12.2	4.4	8.1
Services	22.7	39.5	26.9	44.2	18.1	32.6	33.2	16.5	24.3
Sector									
Private	28.8	42.4	37.1	35.7	69.2	50.6	34.0	67.5	51.9
Herders	43.9	38.8	39.2	3.1	55.6	26.5	4.5	49.8	28.8
Non-herders	27.4	56.7	34.7	32.6	13.6	24.1	29.4	17.8	23.2
Public	22.4	34.7	25.9	23.3	11.2	17.9	17.3	9.0	12.8
State	13.1	45.0	21.6	3.9	1.8	3.0	1.7	1.8	1.8
Total	30.3	43.4	36.1	100.0	100.0	100.0	100.0	100.0	100.0

Source: 2002/03 HIES/LSMS.

Table D.10: Poverty incidence by characteristics of the household head and analytical domain

	Headcount				Share of population				Share of poor			
	Ulaan-baatar	Aimag centers	Soum centers	Country side	Ulaan-baatar	Aimag centers	Soum centers	Country side	Ulaan-baatar	Aimag centers	Soum centers	Country side
Gender												
Male	22.8	33.3	44.3	42.0	78.6	87.2	89.4	90.2	65.8	85.6	88.9	88.6
Female	43.5	37.9	46.8	49.4	21.4	12.8	10.6	9.8	34.2	14.4	11.2	11.4
Age												
Less than 30 years	24.2	21.8	40.2	26.1	7.5	7.8	10.0	19.3	6.6	5.0	9.0	11.7
Between 30 and 49	27.1	37.5	48.5	49.9	50.9	63.3	64.5	57.9	50.6	70.1	70.3	67.7
50 years or more	28.0	29.2	36.1	38.5	41.6	28.9	25.5	22.8	42.7	24.9	20.7	20.6
Educational attainment												
None	48.0	56.7	33.4	45.1	1.6	1.9	2.3	10.1	2.9	3.2	1.8	10.7
Primary	47.8	48.4	56.0	42.0	8.5	7.8	10.5	28.1	14.8	11.1	13.3	27.6
Secondary 8th grade	43.2	52.1	49.8	41.1	18.8	23.5	30.6	38.4	29.8	36.1	34.2	36.9
Complete secondary	29.6	28.7	44.7	45.0	20.1	23.6	22.9	11.0	21.8	20.0	23.0	11.6
Vocational	34.5	35.3	51.4	48.5	10.2	12.9	13.7	5.8	12.9	13.4	15.8	6.6
Higher diploma	17.2	22.6	29.8	40.4	19.1	17.2	12.4	5.2	12.1	11.5	8.3	5.0
University	7.2	12.0	21.8	53.0	21.7	13.2	7.5	1.3	5.7	4.7	3.7	1.6
Migration												
Migrant	23.4	35.3	35.0	45.5	16.7	17.9	10.9	3.4	14.3	18.7	8.6	3.6
Non-migrant	28.0	33.5	45.7	42.6	83.4	82.1	89.1	96.6	85.7	81.3	91.5	96.4
Employment												
Labor force participation												
Employed	21.9	29.3	41.6	41.3	59.6	66.9	71.4	88.3	47.8	57.9	66.7	85.2
Unemployed	43.5	44.2	72.4	43.6	3.5	4.2	3.2	1.3	5.6	5.4	5.1	1.4
Out of labor force	34.4	42.9	49.3	55.1	36.9	29.0	25.4	10.4	46.6	36.7	28.1	13.4
Among those employed, Economic activity												
Agriculture	28.2	45.3	48.7	39.5	2.9	8.9	27.4	79.7	3.0	11.9	30.0	73.8
Industry	27.4	29.1	55.7	61.8	12.6	13.8	6.6	1.5	12.7	11.8	8.2	2.2
Services	19.9	26.1	33.9	56.4	44.1	44.2	37.5	7.0	32.2	34.2	28.6	9.3
Sector												
Private	23.6	35.0	47.9	40.7	35.5	35.8	44.4	83.3	30.8	37.0	47.8	79.3
Herders	28.5	50.5	41.1	38.5	1.7	4.8	19.2	76.4	1.8	7.2	17.7	68.8
Non-herders	23.4	32.5	53.1	64.2	33.8	31.0	25.3	7.0	29.0	29.8	30.1	10.5
Public	19.5	25.4	28.1	52.9	21.5	25.5	22.6	4.7	15.4	19.1	14.2	5.8
State	17.4	10.8	47.2	19.2	2.6	5.5	4.4	0.2	1.6	1.8	4.7	0.1
Total	27.3	33.9	44.5	42.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 2002/03 HIES/LSMS.

Table D.11: Poverty incidence by characteristics of the household head and region

	Headcount					Share of population					Share of poor				
	West	High-land	Central	East	Ulaan-baatar	West	High-land	Central	East	Ulaan-baatar	West	High-land	Central	East	Ulaan-baatar
Gender															
Male	51.4	37.6	33.6	32.7	22.8	94.1	89.0	84.2	88.9	78.6	94.7	86.5	82.3	84.2	65.8
Female	46.3	47.5	38.5	49.4	43.5	5.9	11.0	15.8	11.1	21.4	5.3	13.5	17.7	15.8	34.2
Age															
Less than 30 years	41.7	26.7	22.1	19.1	24.2	12.2	12.5	13.1	15.2	7.5	10.0	8.7	8.4	8.4	6.6
Between 30 and 49	58.3	40.1	41.0	39.8	27.1	64.7	61.8	56.5	64.6	50.9	73.9	64.1	67.4	74.4	50.6
50 years or more	35.8	41.1	27.3	29.4	28.0	23.1	25.6	30.5	20.2	41.6	16.2	27.3	24.2	17.2	42.7
Educational attainment															
None	56.2	40.8	38.9	44.6	48.0	6.4	6.4	3.0	5.6	1.6	7.0	6.8	3.4	7.3	2.9
Primary	56.9	43.6	38.0	45.1	47.8	14.5	18.8	16.0	16.4	8.5	16.2	21.2	17.6	21.5	14.8
Secondary 8th grade	58.3	42.6	44.2	37.9	43.2	30.3	32.6	29.0	33.7	18.8	34.7	35.9	37.3	37.0	29.8
Complete secondary	47.7	43.3	29.2	24.4	29.6	17.3	17.3	19.9	19.8	20.1	16.1	19.3	16.9	13.9	21.8
Vocational	56.4	35.3	38.4	39.5	34.5	12.8	6.3	12.7	10.3	10.2	14.1	5.7	14.2	11.8	12.9
Higher diploma	31.2	27.9	25.0	26.7	17.2	12.0	11.9	10.9	8.9	19.1	7.4	8.6	7.9	6.9	12.1
University	34.9	14.0	10.8	10.9	7.2	6.8	6.7	8.5	5.3	21.7	4.6	2.4	2.7	1.7	5.7
Migration															
Migrant	42.4	29.4	44.6	43.5	23.4	10.2	14.5	5.1	11.2	16.7	8.5	11.0	6.6	14.1	14.3
Non-migrant	52.0	40.2	33.9	33.4	28.0	89.8	85.5	94.9	88.8	83.4	91.6	89.0	93.4	85.9	85.7
Employment															
Labor force participation															
Employed	51.3	35.4	33.4	24.1	21.9	80.7	79.5	72.2	71.0	59.6	81.1	72.7	70.2	49.6	47.8
Unemployed	59.9	50.9	36.8	50.5	43.5	3.3	2.9	1.4	4.3	3.5	3.9	3.9	1.4	6.3	5.6
Out of labor force	48.0	51.4	36.9	61.8	34.4	16.0	17.6	26.4	24.6	36.9	15.0	23.4	28.3	44.1	46.6
Among those employed, Economic activity															
Agriculture	59.0	38.2	37.3	25.0	28.2	43.3	48.8	31.2	44.7	2.9	50.0	48.1	33.8	32.3	3.0
Industry	62.5	28.0	32.7	41.8	27.4	5.5	5.6	11.9	4.0	12.6	6.7	4.1	11.3	4.8	12.7
Services	38.9	31.7	29.6	19.2	19.9	32.0	25.1	29.2	22.4	44.1	24.4	20.5	25.1	12.5	32.2
Sector															
Private	54.7	38.7	37.2	24.5	23.6	61.9	61.9	47.3	56.8	35.5	66.3	61.9	51.2	40.2	30.8
Herders	58.4	37.7	30.5	24.0	28.5	37.0	46.2	25.1	39.8	1.7	42.3	45.0	22.3	27.7	1.8
Non-herders	49.2	41.5	44.8	25.7	23.4	24.8	15.7	22.2	17.0	33.8	23.9	16.9	28.9	12.6	29.0
Public	40.8	27.4	25.1	19.9	19.5	18.1	14.5	18.9	12.7	21.5	14.5	10.3	13.8	7.3	15.4
State	22.7	7.7	30.0	44.1	17.4	0.7	3.0	6.0	1.6	2.6	0.3	0.6	5.3	2.0	1.6
Total	51.1	38.7	34.4	34.5	27.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 2002/03 HIES/LSMS.

Table D.12: Poverty incidence by characteristics of the dwelling and urban-rural divide

	Headcount			Share of population			Share of poor		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Dwelling									
Ger	47.5	41.9	43.4	20.9	73.0	44.2	32.9	70.6	53.1
House	33.9	48.5	38.2	44.7	23.1	35.1	50.1	25.8	37.1
Apartment	14.3	41.8	16.6	32.9	3.7	19.9	15.6	3.6	9.2
Other 1/	31.2	20.0	30.0	1.4	0.2	0.9	1.5	0.1	0.7
Water supply									
Central, hot and cold	9.7	34.3	10.8	32.5	1.9	18.8	10.4	1.5	5.6
Central, only cold	35.7	27.7	34.5	4.7	1.0	3.0	5.5	0.6	2.9
Protected well	41.2	47.5	43.6	43.8	33.3	39.1	59.7	36.5	47.3
Unprotected well	32.5	30.7	30.9	2.3	20.1	10.2	2.5	14.2	8.8
Truck distribution	36.4	43.1	38.4	14.1	7.2	11.1	17.0	7.2	11.8
Other 2/	57.3	47.5	48.3	2.6	36.5	17.7	4.9	40.0	23.7
Improved water sources 3/									
Yes	28.3	46.3	33.0	81.0	36.2	61.0	75.7	38.6	55.8
No	38.8	41.7	40.9	19.0	63.8	39.0	24.4	61.4	44.2
Sewage system									
Yes	25.9	45.1	30.1	71.3	24.5	50.5	61.1	25.5	42.0
No	41.0	42.8	42.2	28.7	75.5	49.5	38.9	74.5	58.0
Improved sanitation 4/									
Yes	26.0	45.0	30.2	73.3	25.6	52.0	63.0	26.5	43.5
No	41.9	42.8	42.5	26.7	74.4	48.0	37.0	73.5	56.5
Heating									
Central	13.4	18.8	13.6	38.0	2.5	22.2	16.8	1.1	8.4
Simple unit 5/	40.6	44.1	42.5	61.8	97.4	77.7	82.8	98.9	91.4
Other 6/	57.1	0.0	43.3	0.2	0.1	0.2	0.4	0.0	0.2
Electricity									
Central	29.7	47.0	33.3	89.4	29.8	62.9	87.7	32.3	58.0
Local	29.3	46.2	38.2	8.7	12.1	10.2	8.4	12.9	10.8
Other 7/	57.7	18.7	19.7	0.2	7.6	3.5	0.3	3.3	1.9
None	64.1	44.3	45.1	1.7	50.4	23.4	3.6	51.5	29.2
National	30.3	43.4	36.1	100.0	100.0	100.0	100.0	100.0	100.0

1/ Students dormitory, public dormitory, other public apartments, others. *2/ Spring, river, snow, ice, others.*

3/ It refers to the percentage of the population with access to an improved water source such as household connection, public standpipe or protected well or spring. Unimproved sources include vendors, tanker trucks and unprotected wells and springs.

4/ It refers to the percentage of the population with access to improved sanitation facilities such as adequate excreta disposal facilities (private or shared but not public). They can range from simple but protected pit latrines to flush toilets with sewerage connection.

5/ Simple heating units fueled by firewood, coal or dung. *6/ Individual electric heating unit, private low pressure stove, others.*

7/ Solar or wind systems, small gen-sets, others.

Source: 2002/03 HIES/LSMS.

Table D.13: Poverty incidence by characteristics of the dwelling and analytical domain

	Headcount				Share of population				Share of poor			
	Ulaan-baatar	Aimag centers	Soum centers	Country side	Ulaan-baatar	Aimag centers	Soum centers	Country side	Ulaan-baatar	Aimag centers	Soum centers	Country side
Dwelling												
Ger	56.7	42.1	46.9	40.4	14.3	28.9	48.1	87.2	29.7	35.9	50.7	82.4
House	33.9	33.8	44.1	57.2	45.5	43.8	42.4	12.0	56.7	43.8	42.1	16.1
Apartment	8.3	25.1	35.9	84.7	38.7	26.1	9.0	0.7	11.8	19.3	7.2	1.4
Other 1/	33.9	27.4	0.0	100.0	1.5	1.3	0.5	0.1	1.9	1.0	0.0	0.2
Water supply												
Central, hot and cold	4.4	20.5	30.2	71.5	39.9	23.6	4.6	0.3	6.5	14.3	3.1	0.5
Central, only cold	45.6	30.8	27.3	36.9	2.8	6.9	2.6	0.1	4.7	6.3	1.6	0.1
Protected well	40.8	41.7	46.9	48.5	45.4	42.0	52.4	22.4	67.9	51.7	55.2	25.4
Unprotected well	100.0	30.7	35.0	29.4	0.1	4.9	12.8	24.2	0.4	4.5	10.1	16.7
Truck distribution	46.9	28.0	47.5	36.8	11.5	17.3	11.7	4.7	19.9	14.3	12.5	4.0
Other 2/	60.8	57.1	49.4	47.1	0.3	5.3	15.8	48.3	0.6	9.0	17.5	53.3
Improved water sources 3/												
Yes	24.5	33.8	44.7	48.7	88.1	72.5	59.7	22.8	79.1	72.3	59.9	26.0
No	47.7	34.1	44.3	41.0	11.9	27.5	40.3	77.2	20.9	27.7	40.1	74.0
Sewage system												
Yes	22.3	31.0	43.4	49.6	76.2	65.5	48.1	11.0	62.3	60.0	46.9	12.8
No	43.2	39.3	45.6	41.9	23.8	34.5	51.9	89.0	37.7	40.0	53.2	87.2
Improved sanitation 4/												
Yes	22.4	30.8	42.7	50.4	77.0	68.8	49.5	12.0	63.3	62.7	47.5	14.1
No	43.4	40.5	46.3	41.7	23.0	31.2	50.5	88.0	36.7	37.3	52.5	85.9
Heating												
Central	7.4	23.1	19.4	10.2	43.4	31.5	6.5	0.3	11.9	21.5	2.9	0.1
Simple unit 5/	42.3	38.9	46.4	42.8	56.3	68.3	93.2	99.7	87.3	78.5	97.2	99.9
Other 6/	100.0	0.0	0.0	-	0.2	0.2	0.2	0.0	0.8	0.0	0.0	0.0
Electricity												
Central	27.1	33.6	46.6	47.9	99.1	77.9	59.1	13.1	98.4	77.4	61.8	14.7
Local	-	29.3	41.8	61.0	0.0	19.1	25.7	4.4	0.0	16.6	24.1	6.3
Other 7/	100.0	0.0	30.1	18.2	0.2	0.2	1.0	11.5	0.7	0.0	0.7	4.9
None	36.3	72.6	42.0	44.6	0.7	2.8	14.3	71.0	1.0	6.0	13.5	74.1
National	27.3	33.9	44.5	42.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Students dormitory, public dormitory, other public apartments, others. *2/ Spring, river, snow, ice, others.*

3/ It refers to the percentage of the population with access to an improved water source such as household connection, public standpipe or protected well or spring. Unimproved sources include vendors, tanker trucks and unprotected wells and springs.

4/ It refers to the percentage of the population with access to improved sanitation facilities such as adequate excreta disposal facilities (private or shared but not public). They can range from simple but protected pit latrines to flush toilets with sewerage connection.

5/ Simple heating units fueled by firewood, coal or dung. *6/ Individual electric heating unit, private low pressure stove, others.*

7/ Solar or wind systems, small gen-sets, others.

Source: 2002/03 HIES/LSMS.

Table D.14: Poverty incidence by characteristics of the dwelling and region

	Headcount					Share of population					Share of poor				
	West	High-land	Central	East	Ulaan-baatar	West	High-land	Central	East	Ulaan-baatar	West	High-land	Central	East	Ulaan-baatar
Dwelling															
Ger	54.0	40.8	33.7	31.0	56.7	65.2	68.4	38.7	51.4	14.3	68.9	72.2	38.0	46.2	29.7
House	48.3	37.1	41.0	34.7	33.9	32.7	22.3	36.1	36.5	45.5	30.9	21.4	42.9	36.7	56.7
Apartment	7.0	24.9	26.4	49.3	8.3	1.7	8.5	24.5	12.0	38.7	0.2	5.5	18.8	17.2	11.8
Other 1/	0.0	45.8	14.4	0.0	33.9	0.5	0.8	0.7	0.1	1.5	0.0	1.0	0.3	0.0	1.9
Water supply															
Central, hot and cold	21.2	20.6	20.1	31.2	4.4	3.2	7.2	17.4	12.3	39.9	1.3	3.8	10.1	11.1	6.5
Central, only cold	0.0	28.0	30.2	34.6	45.6	0.2	1.6	6.8	4.8	2.8	0.0	1.1	6.0	4.8	4.7
Protected well	53.7	40.0	44.1	36.7	40.8	47.4	30.9	36.7	30.5	45.4	49.9	31.9	47.1	32.4	67.9
Unprotected well	52.3	20.8	25.1	30.1	100.0	11.5	8.4	18.4	28.4	0.1	11.8	4.5	13.4	24.7	0.4
Truck distribution	23.9	34.4	37.3	41.1	46.9	8.3	8.0	17.8	8.2	11.5	3.9	7.2	19.3	9.8	19.9
Other 2/	57.6	45.3	48.6	37.6	60.8	29.4	44.0	2.9	15.8	0.3	33.2	51.5	4.1	17.2	0.6
Improved water sources 3/															
Yes	51.5	36.0	35.7	35.0	24.5	50.8	39.6	60.9	47.6	88.1	51.2	36.9	63.2	48.3	79.1
No	50.6	40.4	32.4	34.1	47.7	49.2	60.4	39.1	52.4	11.9	48.8	63.1	36.8	51.7	20.9
Sewage system															
Yes	42.8	38.0	31.9	30.5	22.3	43.9	36.2	41.9	33.6	76.2	36.8	35.6	38.8	29.6	62.3
No	57.5	39.1	36.2	36.6	43.2	56.1	63.8	58.1	66.5	23.8	63.2	64.4	61.2	70.4	37.7
Improved sanitation 4/															
Yes	43.2	37.3	31.5	32.0	22.4	44.6	37.4	45.6	35.7	77.0	37.7	36.1	41.8	33.1	63.3
No	57.4	39.5	36.8	35.9	43.4	55.4	62.6	54.4	64.3	23.0	62.3	63.9	58.2	66.9	36.7
Heating															
Central	17.2	21.5	20.8	30.7	7.4	62.1	51.8	77.8	54.0	99.1	1.2	4.9	14.5	16.5	11.9
Simple unit 5/	52.3	40.3	38.7	35.6	42.3	2.5	5.3	4.8	8.7	0.2	98.9	95.2	85.5	83.5	87.3
Other 6/	0.0	0.0	0.0	0.0	100.0	35.4	42.9	17.4	37.3	0.7	0.0	0.0	0.0	0.0	0.8
Electricity															
Central	51.0	37.5	36.2	35.9	27.1	33.5	34.2	74.2	49.3	99.1	33.5	33.1	78.0	51.2	98.4
Local	35.7	44.0	19.5	40.4	-	28.5	17.7	3.6	4.7	0.0	20.0	20.1	2.1	5.5	0.0
Other 7/	27.2	17.2	21.8	12.1	100.0	2.5	5.3	4.8	8.7	0.2	1.4	2.4	3.0	3.1	0.7
None	65.2	40.1	33.4	37.3	36.3	35.4	42.9	17.4	37.3	0.7	45.2	44.4	16.9	40.3	1.0
National	51.1	38.7	34.4	34.5	27.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Students dormitory, public dormitory, other public apartments, others. *2/ Spring, river, snow, ice, others.*

3/ It refers to the percentage of the population with access to an improved water source such as household connection, public standpipe or protected well or spring. Unimproved sources include vendors, tanker trucks and unprotected wells and springs.

4/ It refers to the percentage of the population with access to improved sanitation facilities such as adequate excreta disposal facilities (private or shared but not public). They can range from simple but protected pit latrines to flush toilets with sewerage connection.

5/ Simple heating units fueled by firewood, coal or dung. *6/ Individual electric heating unit, private low pressure stove, others.*

7/ Solar or wind systems, small gen-sets, others.

Source: 2002/03 HIES/LSMS.

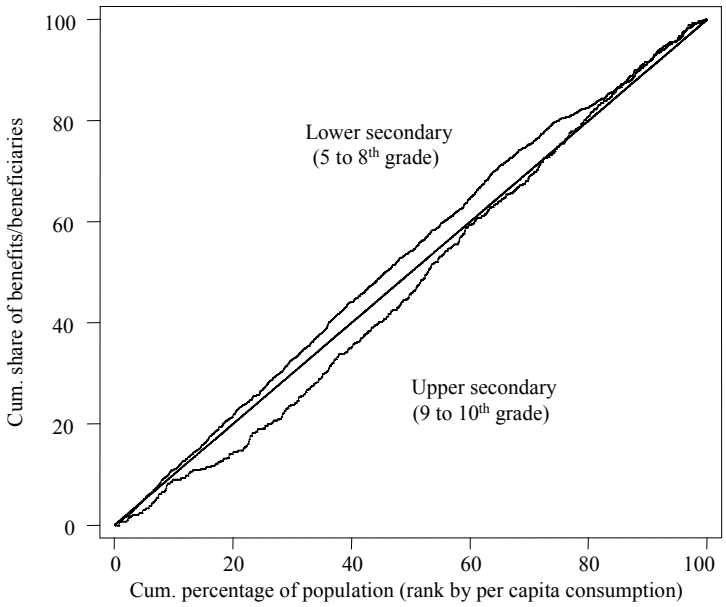
Table D.15: Characteristics of the adult population by highest level of education attained

	None	Primary	Secondary 8th grade	Complete Secondary	Vocational	Higher diploma	University	Total
Location								
Urban	25.0	32.5	43.5	67.2	62.4	75.3	86.8	57.6
Rural	75.0	67.5	56.5	32.8	37.6	24.7	13.2	42.4
Ulaanbaatar	12.6	17.6	22.8	38.0	31.9	43.8	57.0	32.6
Aimag centers	12.5	15.0	20.7	29.2	30.5	31.5	29.8	25.0
Soum centers	9.1	11.4	16.4	16.7	21.5	16.3	9.7	15.3
Countryside	65.8	56.1	40.1	16.2	16.1	8.4	3.5	27.1
West	23.6	20.2	16.4	13.6	17.7	13.3	9.0	15.4
Highland	37.5	28.2	29.4	21.2	15.3	20.1	13.9	23.5
Central a/	13.3	23.9	20.7	19.8	26.2	15.1	15.9	19.8
East	13.0	10.1	10.6	7.5	8.9	7.7	4.1	8.7
Gender								
Men	46.1	46.8	56.2	44.0	47.7	39.5	45.7	47.4
Women	53.9	53.2	43.8	56.0	52.3	60.5	54.3	52.6
Quintile								
Poorest	22.4	21.6	24.8	14.6	18.0	8.9	3.1	16.7
Q2	21.7	20.0	22.7	19.0	19.2	14.4	7.4	18.4
Q3	19.5	20.5	19.7	21.4	19.6	18.8	15.2	19.7
Q4	18.9	19.0	17.5	23.3	22.8	24.7	28.1	21.8
Richest	17.5	19.0	15.4	21.7	20.4	33.3	46.2	23.4
Poverty								
Non-poor	60.6	61.6	57.3	70.5	65.6	80.9	91.6	68.7
Poor	39.4	38.4	42.7	29.5	34.4	19.2	8.4	31.3
National	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a/ Excludes Ulaanbaatar.

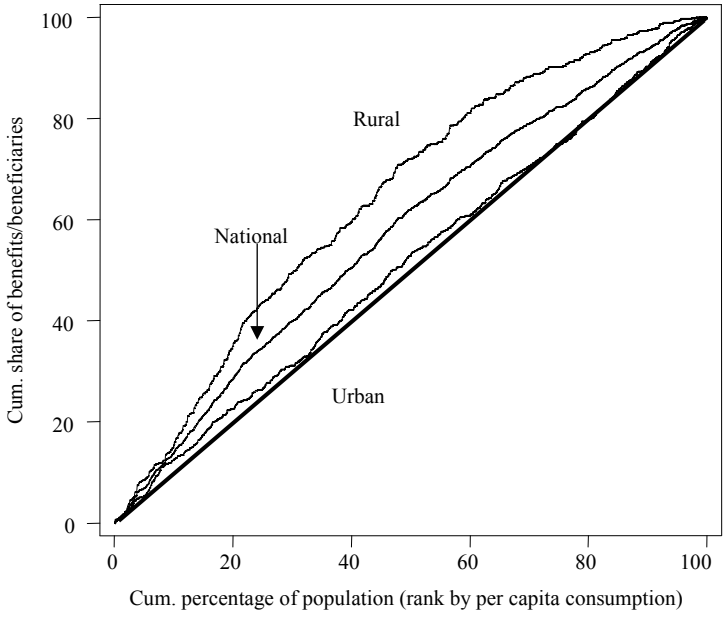
Source: 2002/03 HIES/LSMS.

Figure D.1: Public spending in lower and upper secondary



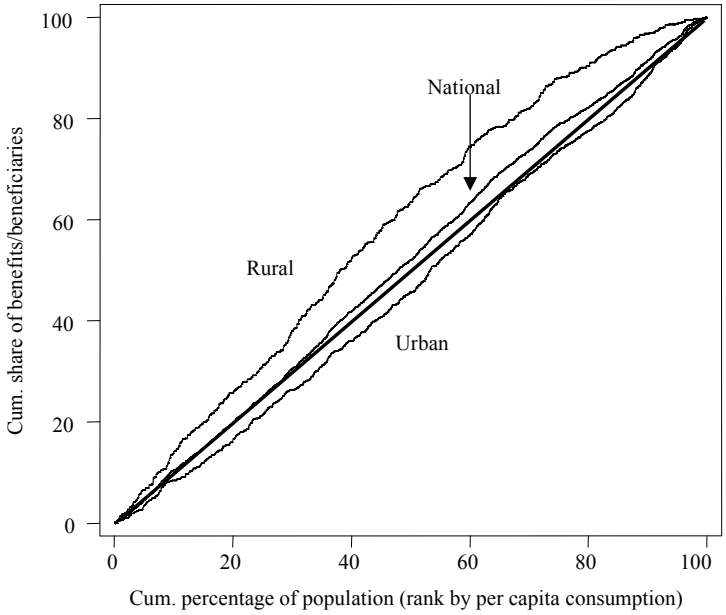
Source: 2002/03 HIES/LSMS.

Figure D.2: Public spending in primary schools by urban-rural divide



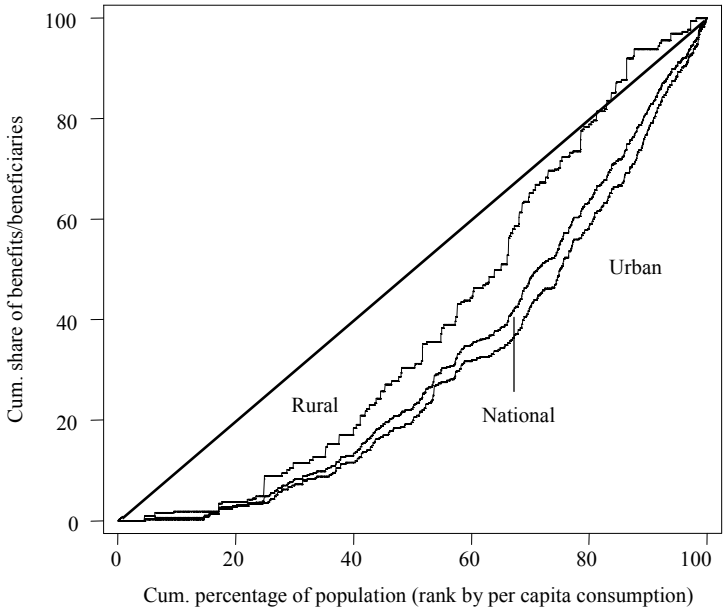
Source: 2002/03 HIES/LSMS.

Figure D.3: Public spending in secondary schools by urban-rural divide



Source: 2002/03 HIES/LSMS.

Figure D.4: Public spending in universities by urban-rural divide



Source: 2002/03 HIES/LSMS.

Table D.16: Enrollment rates comparison, 2002

	Net enrollment rates		Gross enrollment rates	
	LSMS	NSO	LSMS	NSO
Primary	89	89	109	103
Men	89	87	108	103
Women	88	91	111	103
Secondary	75	82	82	82
Men	72	79	79	77
Women	78	84	84	87

Source: 2002/03 HIES/LSMS and National Statistics Office.

Table D.17: Educational level of current students

	Primary	Secondary	University, college	Vocational, others	Total
Location					
Urban	29.9	51.5	17.3	1.2	100.0
Rural	43.1	46.4	8.9	1.7	100.0
Ulaanbaatar	28.2	49.4	21.1	1.3	100.0
Aimag centers	31.8	53.8	13.3	1.2	100.0
Soum centers	34.6	51.0	13.2	1.2	100.0
Countryside	51.5	41.8	4.6	2.1	100.0
West	44.0	45.0	10.0	1.0	100.0
Highland	38.7	49.3	11.1	0.9	100.0
Central a/	33.5	51.4	12.8	2.3	100.0
East	36.3	55.4	6.7	1.7	100.0
Gender					
Men	37.3	49.1	12.0	1.6	100.0
Women	32.8	50.0	16.0	1.2	100.0
Quintile					
Poorest	47.8	48.7	2.5	1.0	100.0
Q2	39.6	51.4	7.3	1.7	100.0
Q3	32.8	53.0	13.4	0.8	100.0
Q4	28.2	49.8	21.4	0.7	100.0
Richest	26.0	44.7	26.5	2.8	100.0
Poverty					
Non-poor	29.5	49.3	19.7	1.5	100.0
Poor	44.5	50.0	4.3	1.2	100.0
National	34.9	49.6	14.1	1.4	100.0

a/ Excludes Ulaanbaatar.

Source: 2002/03 HIES/LSMS.

Table D.18: Characteristics of current students by level of education enrolled

	Primary	Secondary	University, college	Vocational, others	Total
Location					
Urban	53.0	64.4	76.1	54.8	61.9
Rural	47.0	35.6	24.0	45.2	38.1
Ulaanbaatar	25.9	32.1	48.0	29.6	32.1
Aimag centers	27.1	32.3	28.0	25.2	29.8
Soum centers	18.7	19.5	17.7	16.3	18.9
Countryside	28.3	16.2	6.2	28.9	19.2
West	21.4	15.4	12.1	12.5	17.0
Highland	24.3	21.8	17.2	14.8	21.9
Central a/	19.7	21.3	18.6	33.1	20.5
East	8.8	9.5	4.1	10.1	8.5
Gender					
Men	50.4	46.8	40.2	54.5	47.2
Women	49.6	53.2	59.8	45.5	52.8
Quintile					
Poorest	27.3	19.6	3.5	14.2	20.0
Q2	23.3	21.3	10.6	24.7	20.5
Q3	19.1	21.8	19.4	11.6	20.4
Q4	15.4	19.2	28.9	9.1	19.1
Richest	14.9	18.1	37.6	40.4	20.0
Poverty					
Non-poor	53.5	63.1	88.8	68.5	63.5
Poor	46.5	36.9	11.2	31.6	36.5
National	100.0	100.0	100.0	100.0	100.0

a/ Excludes Ulaanbaatar.

Source: 2002/03 HIES/LSMS.

Table D.19: Contraceptive methods, all women 15-49

	National	Urban	Rural	Non-poor	Poor	Poorest	Q2	Q3	Q4	Richest
Ever used contraceptive methods (%)	42	41	43	43	40	40	39	43	41	46
None, primary	18	10	22	15	21	19	23	17	8	20
Sec. 8th grade	34	27	39	30	39	43	31	32	30	28
Complete secondary	44	41	48	44	44	44	45	45	44	41
Vocational, tertiary	58	55	65	59	55	57	53	64	54	60
Married	63	63	62	63	62	64	59	64	61	65
Divorced	49	52	41	52	44	39	51	57	46	53
Single	11	10	11	11	10	11	9	10	8	14
Among women that had used,										
Current use of contraceptive methods (%)	91	90	92	90	93	94	92	87	91	91
None, primary	89	89	89	89	89	85	94	87	100	83
Sec. 8th grade	90	92	89	87	93	94	92	82	91	87
Complete secondary	93	92	95	92	94	96	93	93	92	91
Vocational, tertiary	90	89	92	89	92	93	91	85	91	91
Married	93	93	93	92	95	96	94	91	94	91
Divorced	74	75	70	71	78	82	76	53	76	83
Single	90	90	89	90	88	84	96	89	77	98
Which method? (%)										
IUD	47	44	52	44	53	56	46	48	44	43
Pill, drugs	19	21	15	20	16	14	21	17	22	20
Calendar	13	16	10	16	7	5	10	17	15	17
Injection	9	6	14	7	13	14	11	9	8	6
Condom	9	11	5	9	7	8	7	7	9	12
Others b/	3	3	4	3	4	4	6	2	3	3

a/ Includes abstinence, withdrawal, patch, male or female sterilization, diaphragm, and spermicide.
Source: 2002/03 HIES/LSMS.

Table D.20: Abortions, all women 15 to 49

	National	Urban	Rural	Non-poor	Poor	Poorest	Q2	Q3	Q4	Richest
Ever had abortions? (%)	12	15	7	14	9	9	8	13	13	16
None, primary	3	4	3	3	4	4	2	5	3	2
Sec. 8th grade	7	8	6	6	8	9	5	6	6	7
Complete secondary	10	13	6	12	8	7	8	13	15	8
Vocational, tertiary	22	23	17	23	16	15	17	24	19	27
Married	19	25	12	21	14	15	13	20	21	25
Divorced	15	19	5	18	11	11	10	22	18	16
Single	1	2	0	1	1	0	1	2	1	2
Reasons for abortion (%)										
Due to health	29	24	43	29	29	28	29	25	27	34
Do not want a child	20	21	18	24	11	11	13	18	21	30
Too soon to give birth again	21	22	18	20	24	19	28	26	20	15
Lack of money	19	20	16	16	29	36	19	23	18	10
Others a/	10	12	5	11	8	6	11	8	14	11

a/ Attending school, not married, others.
Source: 2002/03 HIES/LSMS.

Table D.21: Labor force participation and unemployment rates comparison

	Household survey		Labor Force Survey 2003	Administrative data 2002
	International standard 2002	Mongolian standard 2002		
Labor force participation rates				
National	61.6	65.2	67.7	62.7
Urban	53.0	57.1	56.8	n.a.
Rural	73.2	76.0	81.2	n.a.
Men	64.3	67.6	72.7	64.9
Women	59.1	62.9	62.8	60.5
Unemployment rates				
National	6.3	6.6	14.2	3.4
Urban	8.8	9.1	18.7	n.a.
Rural	3.9	4.1	10.0	n.a.
Men	6.4	6.5	14.2	3.1
Women	6.2	6.7	14.1	3.8

Source: 2002/03 HIES/LSMS, 2003 Labor Force Survey and National Statistical Office.

Table D.22: Participation rates by gender

	Men	Women	Total
Location			
Urban	58.2	56.1	57.1
Rural	79.5	72.5	76.0
Ulaanbaatar	57.2	54.8	56.0
Aimag centers	59.5	57.7	58.6
Soum centers	62.3	58.8	60.5
Countryside	89.6	81.5	85.7
West	77.5	68.0	72.7
Highland	77.2	71.7	74.4
Central a/	62.9	59.4	61.1
East	70.6	67.4	69.0
Quintile			
Poorest	62.2	58.5	60.3
Q2	66.5	62.6	64.5
Q3	69.7	62.8	66.1
Q4	68.4	63.7	66.1
Richest	70.4	66.4	68.3
Poverty			
Non-poor	69.1	64.4	66.7
Poor	64.6	59.9	62.2
Education			
None	70.6	61.9	67.4
Primary	67.5	57.8	63.4
Secondary 8th grade	64.2	57.5	61.2
Complete secondary	58.9	52.2	55.1
Vocational	74.6	70.5	72.5
Higher diploma	82.3	81.1	81.6
University	82.5	83.2	82.9
National	67.6	62.9	65.2

a/ Excludes Ulaanbaatar.

Source: 2002/03 HIES/LSMS.

Table D.23: Participation rates by poverty status

	Non-poor	Poor	Total
Location			
Urban	59.7	50.5	57.1
Rural	78.0	73.1	76.0
Ulaanbaatar	58.6	48.2	56.0
Aimag centers	61.2	52.8	58.6
Soum centers	60.8	60.0	60.5
Countryside	88.3	81.7	85.7
West	70.0	75.8	72.7
Highland	76.2	71.3	74.4
Central a/	63.5	56.3	61.1
East	76.8	52.2	69.0
Gender			
Male	69.1	64.6	67.6
Female	64.4	59.9	62.9
Education			
None	68.1	66.7	67.4
Primary	67.1	59.2	63.4
Secondary 8th grade	63.5	58.0	61.2
Complete secondary	52.0	62.7	55.1
Vocational	73.9	70.0	72.5
Higher diploma	84.1	71.3	81.6
University	83.7	73.8	82.9
National	66.7	62.2	65.2

a/ Excludes Ulaanbaatar.

Source: 2002/03 HIES/LSMS.

Table D.24: Population by labor force status

	As % of the variable of interest				As % of the labor force status			
	Employed	Unemployed	Out of the Labor Force	Total	Employed	Unemployed	Out of the Labor Force	Total
Location								
Urban	52.0	5.2	42.9	100.0	48.8	68.9	70.5	57.2
Rural	72.9	3.1	24.0	100.0	51.2	31.1	29.5	42.8
Ulaanbaatar	51.3	4.6	44.0	100.0	26.7	34.0	40.0	31.6
Aimag centers	52.7	5.9	41.4	100.0	22.1	34.9	30.5	25.6
Soum centers	55.3	5.2	39.5	100.0	14.9	19.9	18.6	16.4
Countryside	83.9	1.8	14.3	100.0	36.4	11.2	10.9	26.4
West	68.2	4.6	27.3	100.0	17.6	16.6	12.3	15.7
Highland	69.9	4.5	25.6	100.0	27.6	25.2	17.7	24.1
Central a/	58.4	2.7	38.9	100.0	18.8	12.5	22.0	19.6
East	63.4	5.6	31.0	100.0	9.3	11.8	8.0	9.0
Quintile								
Poorest	53.5	6.7	39.7	100.0	15.9	28.3	20.6	18.1
Q2	58.7	5.8	35.5	100.0	18.6	26.2	19.7	19.3
Q3	61.4	4.7	33.9	100.0	20.2	21.9	19.5	20.0
Q4	63.1	3.0	33.9	100.0	22.0	14.6	20.7	21.2
Richest	66.5	1.8	31.7	100.0	23.4	9.1	19.5	21.4
Poverty								
Non-poor	63.5	3.3	33.3	100.0	69.4	50.8	63.7	66.6
Poor	55.9	6.3	37.8	100.0	30.6	49.2	36.3	33.4
Gender								
Men	63.2	4.4	32.4	100.0	51.0	50.3	45.8	49.2
Women	58.7	4.2	37.1	100.0	49.0	49.7	54.2	50.8
Age								
16-24	34.0	5.0	61.0	100.0	19.0	39.3	59.6	34.0
25-34	73.2	4.8	22.0	100.0	31.8	29.6	16.7	26.5
35-44	79.2	4.5	16.3	100.0	30.7	24.8	11.1	23.6
45-54	71.0	1.8	27.2	100.0	16.1	5.8	10.8	13.8
55-59 b/	69.8	1.0	29.2	100.0	2.4	0.5	1.8	2.1
Education								
None	64.1	3.3	32.6	100.0	3.7	2.7	3.3	3.5
Primary	61.1	2.3	36.6	100.0	10.3	5.5	10.9	10.3
Secondary 8th grade	56.2	4.9	38.8	100.0	26.9	33.5	32.5	29.1
Complete secondary	50.0	5.1	44.9	100.0	22.9	33.3	36.0	27.9
Vocational	68.1	4.4	27.5	100.0	9.6	8.8	6.8	8.6
Higher diploma	78.2	3.4	18.4	100.0	14.6	9.1	6.0	11.4
University	79.5	3.4	17.1	100.0	12.0	7.2	4.5	9.2
Total	60.9	4.3	34.8	100.0	100.0	100.0	100.0	100.0

a/ Excludes Ulaanbaatar. *b/ Includes only men.*

Source: 2002/03 HIES/LSMS.

Table D.25: Industry, sector and occupation by urban-rural divide and gender

	Urban			Rural			National		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Industry									
Agriculture	8.0	7.8	7.9	77.6	75.4	76.6	45.1	41.0	43.1
Industry	23.9	14.8	19.2	3.9	2.6	3.3	13.2	8.8	11.1
Services	68.1	77.4	72.9	18.5	21.9	20.1	41.7	50.2	45.9
Agriculture	8.0	7.8	7.9	77.6	75.4	76.6	45.1	41.0	43.1
Mining	5.6	1.8	3.7	1.7	0.8	1.3	3.5	1.3	2.5
Manufacturing	6.1	8.1	7.1	0.8	1.2	1.0	3.2	4.8	4.0
Electricity/water	4.8	1.6	3.1	0.7	0.4	0.6	2.6	1.0	1.8
Contruction	7.4	3.2	5.3	0.7	0.2	0.5	3.8	1.7	2.8
Trade	10.8	17.7	14.3	1.9	3.4	2.6	6.1	10.7	8.3
Transportation	15.1	3.3	9.1	3.0	0.8	2.0	8.7	2.1	5.5
Business	6.9	6.4	6.6	1.6	0.7	1.2	4.1	3.6	3.8
Public administration	14.0	8.4	11.1	4.6	1.7	3.3	9.0	5.1	7.1
Education	6.3	15.2	10.8	3.5	8.2	5.7	4.8	11.8	8.2
Health	2.0	10.5	6.4	1.2	4.1	2.5	1.6	7.4	4.4
Other	13.2	15.9	14.6	2.6	3.0	2.8	7.5	9.6	8.5
Sector									
Private	61.5	57.9	59.7	86.7	84.0	85.4	74.9	70.7	72.9
Public	32.4	38.8	35.7	11.3	14.9	13.0	21.2	27.1	24.1
State	6.0	3.3	4.6	2.1	1.1	1.6	3.9	2.2	3.1
Occupation									
Herders, farmers	6.7	6.8	6.7	75.0	73.4	74.3	43.1	39.4	41.3
Managers, senior officials and legislators	6.9	4.1	5.5	2.8	0.6	1.8	4.7	2.4	3.6
Professionals	12.1	24.3	18.3	2.6	7.3	4.8	7.0	16.0	11.4
Technicians and associate professionals	9.0	11.0	10.0	1.8	3.4	2.6	5.2	7.3	6.2
Clerks	1.8	5.5	3.7	0.9	2.1	1.5	1.3	3.8	2.5
Service workers, shop and market salespeople	14.3	24.1	19.3	2.5	5.8	4.0	8.0	15.1	11.5
Skilled agricultural and fishery workers	0.7	0.5	0.6	1.5	1.2	1.4	1.1	0.9	1.0
Craft and related trader workers	17.8	12.1	14.9	4.7	2.2	3.5	10.8	7.2	9.1
Plant and machine operators	20.4	1.7	10.8	5.0	0.3	2.8	12.2	1.0	6.7
Elementary occupations	7.7	7.5	7.6	2.3	3.1	2.7	4.8	5.4	5.1
Others	2.6	2.6	2.6	1.0	0.6	0.8	1.7	1.6	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 2002/03 HIES/LSMS.

Table D.26: Industry, sector and occupation by urban-rural divide and poverty status

	Urban			Rural			National		
	Non-poor	Poor	Total	Non-poor	Poor	Total	Non-poor	Poor	Total
Industry									
Agriculture	5.9	14.7	7.9	75.6	78.2	76.6	37.9	54.9	43.1
Industry	18.1	22.7	19.2	2.8	4.1	3.3	11.1	11.0	11.1
Services	76.0	62.6	72.9	21.6	17.7	20.1	51.0	34.2	45.9
Agriculture	5.9	14.7	7.9	75.6	78.2	76.6	37.9	54.9	43.1
Mining	3.8	3.4	3.7	1.6	0.9	1.3	2.8	1.8	2.5
Manufacturing	6.3	10.0	7.1	0.7	1.5	1.0	3.7	4.6	4.0
Electricity/water	3.4	2.4	3.1	0.3	0.9	0.6	2.0	1.5	1.8
Contruction	4.8	6.9	5.3	0.2	0.9	0.5	2.7	3.1	2.8
Trade	15.1	11.6	14.3	2.2	3.3	2.6	9.2	6.4	8.3
Transportation	9.3	8.5	9.1	2.0	1.9	2.0	5.9	4.3	5.5
Business	6.8	6.1	6.6	1.1	1.3	1.2	4.2	3.1	3.8
Public administration	12.1	7.9	11.1	3.8	2.4	3.3	8.3	4.4	7.1
Education	11.8	7.6	10.8	6.5	4.5	5.7	9.4	5.6	8.2
Health	6.3	6.4	6.4	3.1	1.5	2.5	4.9	3.3	4.4
Other	14.6	14.5	14.6	2.8	2.7	2.8	9.2	7.1	8.5
Sector									
Private	56.9	69.0	59.7	83.4	88.7	85.4	69.1	81.5	72.9
Public	37.8	28.7	35.7	14.8	10.0	13.0	27.2	16.8	24.1
State	5.3	2.4	4.6	1.8	1.3	1.6	3.7	1.7	3.1
Occupation									
Herders, farmers	4.6	14.0	6.7	73.9	74.9	74.3	36.4	52.5	41.3
Managers, senior officials and legislators	6.6	1.8	5.5	2.4	0.8	1.8	4.6	1.1	3.6
Professionals	21.6	7.5	18.3	6.1	2.7	4.8	14.5	4.5	11.4
Technicians and associate professionals	11.3	5.8	10.0	2.9	2.0	2.6	7.4	3.4	6.2
Clerks	4.2	2.0	3.7	1.5	1.5	1.5	2.9	1.6	2.5
Service workers, shop and market salespeople	18.5	22.0	19.3	4.1	3.9	4.0	11.9	10.5	11.5
Skilled agricultural and fishery workers	0.5	1.0	0.6	1.0	1.9	1.4	0.7	1.6	1.0
Craft and related trader workers	12.1	24.2	14.9	2.7	4.9	3.5	7.8	12.0	9.1
Plant and machine operators	11.6	8.2	10.8	2.9	2.7	2.8	7.6	4.7	6.7
Elementary occupations	6.6	11.0	7.6	2.1	3.6	2.7	4.5	6.3	5.1
Others	2.6	2.6	2.6	0.6	1.2	0.8	1.7	1.7	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 2002/03 HIES/LSMS.

Table D.27: Unemployment rates by gender

	Men	Women	Total
Location			
Urban	9.5	8.6	9.1
Rural	3.7	4.6	4.1
Ulaanbaatar	9.0	7.5	8.3
Aimag centers	10.1	9.9	10.0
Soum centers	7.9	9.4	8.6
Countryside	2.0	2.3	2.1
West	6.6	5.9	6.3
Highland	5.0	7.2	6.0
Central a/	3.8	5.2	4.5
East	9.1	7.2	8.2
Quintile			
Poorest	10.7	11.7	11.2
Q2	7.0	11.1	9.0
Q3	7.9	6.3	7.1
Q4	4.8	4.1	4.5
Richest	3.4	1.9	2.7
Age			
16-24	13.1	12.5	12.8
25-34	5.1	7.2	6.2
35-44	5.5	5.3	5.4
45-54	3.4	1.7	2.5
55-59 b/	1.4	-	1.4
Education			
None	6.8	1.2	4.9
Primary	3.2	4.2	3.6
Secondary 8th grade	8.5	7.5	8.1
Complete secondary	8.6	9.9	9.3
Vocational	6.1	6.1	6.1
Higher diploma	3.6	4.6	4.2
University	3.2	4.7	4.1
National	6.5	6.7	6.6

a/ Excludes Ulaanbaatar. *b/ Includes only men.*

Source: 2002/03 HIES/LSMS.

Table D.28: Unemployment rates by poverty status

	Non-poor	Poor	Total
Location			
Urban	6.8	15.9	9.1
Rural	2.6	6.5	4.1
Ulaanbaatar	6.5	14.5	8.3
Aimag centers	7.1	17.2	10.0
Soum centers	5.1	13.8	8.6
Countryside	1.6	3.0	2.1
West	5.2	7.4	6.3
Highland	4.0	9.9	6.0
Central a/	3.5	6.7	4.5
East	4.8	18.9	8.2
Gender			
Male	5.3	9.1	6.5
Female	4.5	11.4	6.7
Age			
16-24	9.1	18.6	12.8
25-34	5.2	8.3	6.2
35-44	4.2	7.9	5.4
45-54	1.7	4.9	2.5
55-59 b/	1.8	0.0	1.4
Education			
None	2.2	7.6	4.9
Primary	2.0	5.8	3.6
Secondary 8th grade	5.3	12.1	8.1
Complete secondary	7.6	12.7	9.3
Vocational	5.1	7.9	6.1
Higher diploma	3.7	6.6	4.2
University	3.7	8.9	4.1
National	4.9	10.2	6.6

a/ Excludes Ulaanbaatar. *b/ Includes only men.*

Source: 2002/03 HIES/LSMS.

E. APPENDIX E: STANDARD ERRORS AND CONFIDENCE INTERVALS OF POVERTY ESTIMATIONS

Table E.1: Poverty and urban-rural divide

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
Headcount						
National	36.11	1.43	33.31	38.92	2.92	3,308
Urban	30.27	1.70	26.92	33.62	2.52	1,851
Rural	43.38	2.37	38.73	48.04	3.36	1,457
Poverty Gap						
National	10.99	0.60	9.82	12.16	3.40	3,308
Urban	9.20	0.71	7.81	10.58	2.93	1,851
Rural	13.22	1.00	11.26	15.18	3.86	1,457
Severity						
National	4.67	0.33	4.02	5.32	3.33	3,308
Urban	3.97	0.40	3.18	4.75	2.92	1,851
Rural	5.55	0.55	4.48	6.62	3.74	1,457

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.2: Poverty and geography

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
Headcount						
West	51.06	3.48	44.21	57.90	2.72	527
Highland	38.68	2.86	33.05	44.30	2.75	849
Central	34.40	2.99	28.53	40.27	2.55	697
East	34.54	4.36	25.97	43.12	2.58	332
Ulaanbaatar	27.27	2.55	22.25	32.28	3.27	903
Poverty Gap						
West	14.58	1.34	11.95	17.20	2.78	527
Highland	12.26	1.27	9.77	14.75	3.46	849
Central	10.11	1.38	7.40	12.83	3.75	697
East	12.36	2.29	7.86	16.86	3.18	332
Ulaanbaatar	8.11	0.98	6.19	10.02	3.57	903
Severity						
West	5.73	0.65	4.44	7.01	2.43	527
Highland	5.19	0.69	3.83	6.55	3.38	849
Central	4.31	0.81	2.73	5.90	3.96	697
East	6.58	1.56	3.51	9.64	3.22	332
Ulaanbaatar	3.32	0.48	2.37	4.26	3.37	903

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.3: Poverty and analytical domains

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
Headcount						
Ulaanbaatar	27.27	2.55	22.25	32.28	3.27	903
Aimag centers	33.86	2.19	29.55	38.16	1.79	948
Soum centers	44.53	3.01	38.62	50.44	1.96	753
Countryside	42.73	3.30	36.25	49.21	4.17	704
Poverty Gap						
Ulaanbaatar	8.11	0.98	6.19	10.02	3.57	903
Aimag centers	10.50	1.02	8.49	12.52	2.40	948
Soum centers	14.37	1.54	11.34	17.40	2.92	753
Countryside	12.56	1.30	10.01	15.11	4.53	704
Severity						
Ulaanbaatar	3.32	0.48	2.37	4.26	3.37	903
Aimag centers	4.74	0.66	3.45	6.03	2.66	948
Soum centers	6.42	0.92	4.62	8.22	3.01	753
Countryside	5.06	0.68	3.72	6.39	4.37	704

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.4: Poverty and seasonality

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
Headcount						
Quarter I	29.09	3.03	23.14	35.05	3.59	814
Quarter II	40.34	2.66	35.12	45.56	2.25	757
Quarter III	33.54	2.79	28.05	39.03	2.95	859
Quarter IV	41.23	2.90	35.53	46.93	3.10	878
Poverty Gap						
Quarter I	7.97	1.01	5.99	9.95	3.32	814
Quarter II	11.71	1.11	9.53	13.89	2.68	757
Quarter III	10.34	1.16	8.06	12.62	3.37	859
Quarter IV	13.70	1.35	11.04	16.36	3.85	878
Severity						
Quarter I	3.09	0.54	2.02	4.16	3.31	814
Quarter II	4.91	0.59	3.75	6.07	2.40	757
Quarter III	4.43	0.59	3.27	5.60	3.01	859
Quarter IV	6.12	0.80	4.56	7.69	3.99	878

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.5: Poverty and gender of the household head

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
Headcount						
Men	34.84	1.51	31.88	37.81	2.84	2,733
Women	43.77	2.98	37.92	49.63	1.70	575
Poverty Gap						
Men	10.29	0.60	9.10	11.48	3.20	2,733
Women	15.21	1.43	12.41	18.02	2.05	575
Severity						
Men	4.29	0.33	3.64	4.94	3.15	2,733
Women	6.99	0.84	5.34	8.63	2.10	575

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.6: Poverty and highest education level completed by the household head

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
Headcount						
None	45.75	4.88	36.17	55.34	1.34	169
Primary	45.60	3.57	38.58	52.62	2.41	435
Secondary 8th grade	45.47	2.30	40.96	49.98	1.93	841
Complete secondary	34.86	2.34	30.26	39.45	1.50	646
Vocational	40.67	3.38	34.03	47.31	1.60	335
Higher diploma	23.35	2.47	18.50	28.21	1.53	476
University	11.60	2.13	7.42	15.78	1.68	406
Poverty Gap						
None	12.79	1.74	9.37	16.20	1.32	169
Primary	16.35	1.75	12.91	19.79	2.75	435
Secondary 8th grade	13.81	0.92	12.00	15.61	2.01	841
Complete secondary	9.29	0.88	7.57	11.01	1.77	646
Vocational	13.07	1.47	10.17	15.97	1.71	335
Higher diploma	6.74	0.93	4.91	8.58	1.72	476
University	2.93	0.65	1.64	4.21	1.65	406
Severity						
None	4.84	0.88	3.11	6.56	1.27	169
Primary	7.90	1.07	5.79	10.01	2.61	435
Secondary 8th grade	5.72	0.47	4.79	6.65	1.85	841
Complete secondary	3.56	0.45	2.68	4.44	1.81	646
Vocational	6.00	0.95	4.14	7.86	1.97	335
Higher diploma	2.74	0.55	1.66	3.81	1.92	476
University	1.06	0.30	0.47	1.65	1.58	406

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.7: Poverty and type of dwelling

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
Headcount						
Gers	43.39	2.19	39.09	47.69	2.85	1,403
Houses	38.17	1.91	34.41	41.92	1.79	1,192
Apartments	16.62	2.29	12.13	21.11	2.48	679
Others	29.99	6.68	16.87	43.11	0.61	34
Poverty Gap						
Gers	13.48	0.92	11.68	15.28	3.17	1,403
Houses	11.31	0.86	9.62	13.00	2.43	1,192
Apartments	4.99	1.09	2.86	7.13	3.88	679
Others	9.09	2.47	4.23	13.95	0.73	34
Severity						
Gers	5.68	0.49	4.71	6.65	3.02	1,403
Houses	4.82	0.51	3.81	5.82	2.58	1,192
Apartments	2.25	0.66	0.96	3.55	4.50	679
Others	3.23	1.29	0.69	5.77	0.91	34

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.8: Poverty, type of dwelling and urban-rural divide

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf.	Interval]	Design effect	Obs.
Headcount						
Urban Gers	47.51	3.25	41.13	53.89	1.62	400
Urban Houses	33.90	2.16	29.65	38.14	1.71	792
Urban Apartments	14.34	2.11	10.19	18.48	2.18	632
Urban Others	31.22	7.06	17.34	45.09	0.60	27
Rural Gers	41.92	2.73	36.55	47.30	3.30	1,003
Rural Houses	48.48	3.74	41.12	55.83	1.90	400
Rural Apartments	41.84	10.41	21.39	62.30	2.44	47
Rural Others	20.05	18.42	-16.14	56.24	0.67	7
Poverty Gap						
Urban Gers	14.72	1.42	11.92	17.51	1.93	400
Urban Houses	10.49	1.04	8.43	12.54	2.50	792
Urban Apartments	3.92	0.74	2.47	5.37	2.25	632
Urban Others	9.65	2.74	4.26	15.03	0.75	27
Rural Gers	13.04	1.13	10.81	15.26	3.65	1,003
Rural Houses	13.30	1.50	10.34	16.25	2.25	400
Rural Apartments	16.79	8.00	1.08	32.51	5.45	47
Rural Others	4.58	4.21	-3.69	12.85	0.67	7
Severity						
Urban Gers	6.19	0.77	4.67	7.71	1.83	400
Urban Houses	4.67	0.65	3.39	5.94	2.73	792
Urban Apartments	1.62	0.38	0.88	2.36	2.18	632
Urban Others	3.50	1.47	0.61	6.38	0.95	27
Rural Gers	5.50	0.61	4.29	6.70	3.49	1,003
Rural Houses	5.18	0.77	3.67	6.69	2.11	400
Rural Apartments	9.24	5.28	-1.14	19.62	5.44	47
Rural Others	1.05	0.96	-0.84	2.94	0.67	7

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.9: Poverty and livestock holdings

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
NATIONAL						
Headcount						
Non-herders	34.56	1.58	31.47	37.66	2.28	2,205
Herders	38.73	2.61	33.59	43.86	3.55	1,103
Poverty Gap						
Non-herders	10.86	0.70	9.49	12.24	2.81	2,205
Herders	11.20	1.02	9.20	13.19	3.97	1,103
Severity						
Non-herders	4.80	0.41	3.99	5.61	2.93	2,205
Herders	4.45	0.53	3.41	5.49	3.90	1,103
URBAN-RURAL						
Headcount						
Urban Non-herders	29.92	1.76	26.47	33.38	2.46	1,680
Urban Herders	33.71	5.14	23.61	43.82	1.97	171
Rural Non-herders	53.49	3.17	47.26	59.72	1.65	525
Rural Herders	39.51	2.91	33.78	45.23	3.78	932
Poverty Gap						
Urban Non-herders	9.23	0.73	7.79	10.66	2.81	1,680
Urban Herders	8.88	2.31	4.35	13.42	3.26	171
Rural Non-herders	17.53	1.75	14.10	20.96	2.51	525
Rural Herders	11.56	1.12	9.36	13.76	4.08	932
Severity						
Urban Non-herders	4.01	0.42	3.19	4.84	2.89	1,680
Urban Herders	3.50	1.25	1.05	5.95	3.28	171
Rural Non-herders	8.03	1.09	5.88	10.17	2.69	525
Rural Herders	4.60	0.58	3.46	5.74	4.00	932

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.10: Poverty and access to improved water sources

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
NATIONAL						
Headcount						
Yes	33.04	1.65	29.81	36.28	2.47	2,099
No	40.92	2.40	36.20	45.65	3.08	1,209
Poverty Gap						
Yes	9.91	0.66	8.63	11.20	2.67	2,099
No	12.67	1.01	10.69	14.65	3.48	1,209
Severity						
Yes	4.24	0.35	3.55	4.93	2.41	2,099
No	5.36	0.56	4.25	6.46	3.54	1,209
URBAN-RURAL						
Headcount						
Urban Yes	28.27	1.89	24.55	32.00	2.63	1,492
Urban No	38.77	3.33	32.23	45.32	1.63	359
Rural Yes	46.32	3.07	40.28	52.36	2.03	607
Rural No	41.72	3.05	35.73	47.71	3.59	850
Poverty Gap						
Urban Yes	8.56	0.74	7.11	10.01	2.73	1,492
Urban No	11.92	1.54	8.89	14.95	2.21	359
Rural Yes	13.68	1.35	11.04	16.33	2.49	607
Rural No	12.95	1.25	10.49	15.41	3.93	850
Severity						
Urban Yes	3.69	0.40	2.90	4.47	2.49	1,492
Urban No	5.16	0.87	3.45	6.86	2.22	359
Rural Yes	5.76	0.72	4.36	7.17	2.21	607
Rural No	5.43	0.70	4.06	6.81	4.04	850

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.11: Poverty and access to improved sanitation facilities

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
NATIONAL						
Headcount						
Yes	30.19	1.68	26.88	33.50	2.31	1,819
No	42.54	2.08	38.46	46.62	2.80	1,489
Poverty Gap						
Yes	9.05	0.69	7.70	10.40	2.69	1,819
No	13.10	0.86	11.40	14.79	3.06	1,489
Severity						
Yes	3.84	0.37	3.12	4.56	2.55	1,819
No	5.57	0.49	4.62	6.53	2.98	1,489
URBAN-RURAL						
Headcount						
Urban Yes	26.03	1.91	22.27	29.79	2.55	1,356
Urban No	41.88	2.78	36.42	47.34	1.55	495
Rural Yes	44.99	3.26	38.58	51.41	1.62	463
Rural No	42.83	2.73	37.46	48.20	3.35	994
Poverty Gap						
Urban Yes	7.67	0.74	6.22	9.13	2.84	1,356
Urban No	13.37	1.31	10.81	15.94	1.94	495
Rural Yes	13.93	1.59	10.81	17.05	2.25	463
Rural No	12.97	1.10	10.80	15.14	3.66	994
Severity						
Urban Yes	3.19	0.39	2.43	3.94	2.67	1,356
Urban No	6.10	0.83	4.46	7.73	2.11	495
Rural Yes	6.16	0.90	4.39	7.93	2.20	463
Rural No	5.34	0.60	4.17	6.52	3.57	994

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.12: Poverty and access to electricity

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
NATIONAL						
Headcount						
Yes	34.02	1.46	31.15	36.89	2.30	2,595
No	41.82	3.22	35.50	48.13	3.78	713
Poverty Gap						
Yes	10.32	0.61	9.11	11.53	2.78	2,595
No	12.81	1.30	10.25	15.37	3.85	713
Severity						
Yes	4.35	0.33	3.69	5.01	2.77	2,595
No	5.55	0.72	4.13	6.97	3.41	713
URBAN-RURAL						
Headcount						
Urban Yes	29.64	1.70	26.31	32.98	2.49	1,815
Urban No	63.51	8.76	46.29	80.74	1.12	36
Rural Yes	46.74	2.72	41.40	52.09	1.84	780
Rural No	40.96	3.32	34.43	47.49	3.90	677
Poverty Gap						
Urban Yes	8.81	0.66	7.51	10.11	2.71	1,815
Urban No	29.88	7.28	15.58	44.18	1.82	36
Rural Yes	14.71	1.36	12.04	17.38	2.77	780
Rural No	12.14	1.32	9.55	14.72	4.18	677
Severity						
Urban Yes	3.69	0.35	3.01	4.37	2.52	1,815
Urban No	18.77	5.98	7.02	30.51	1.88	36
Rural Yes	6.28	0.80	4.71	7.85	3.07	780
Rural No	5.03	0.71	3.64	6.41	3.91	677

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

Table E.13: Poverty and joint access to improved water sources, sanitation facilities and electricity

Survey mean estimation

Number of obs = 3,308
Number of strata = 4
Number of PSUs = 460
Population size = 2,328,812

	Estimate	Std. Err.	[95% Conf. Interval]		Design effect	Obs.
NATIONAL						
Headcount						
Yes	26.90	1.81	23.35	30.46	2.31	1,456
No	42.78	1.92	39.00	46.56	2.90	1,852
Poverty Gap						
Yes	7.87	0.68	6.53	9.21	2.41	1,456
No	13.25	0.82	11.64	14.86	3.28	1,852
Severity						
Yes	3.29	0.35	2.60	3.98	2.21	1,456
No	5.67	0.46	4.76	6.59	3.23	1,852
URBAN-RURAL						
Headcount						
Urban Yes	24.00	2.00	20.06	27.94	2.55	1,173
Urban No	41.00	2.43	36.23	45.77	1.64	678
Rural Yes	41.42	3.84	33.86	48.97	1.41	283
Rural No	43.75	2.65	38.54	48.96	3.55	1,174
Poverty Gap						
Urban Yes	6.97	0.74	5.53	8.42	2.62	1,173
Urban No	13.01	1.17	10.71	15.30	2.24	678
Rural Yes	12.34	1.73	8.95	15.74	1.82	283
Rural No	13.38	1.09	11.24	15.52	3.89	1,174
Severity						
Urban Yes	2.88	0.38	2.15	3.62	2.37	1,173
Urban No	5.82	0.73	4.38	7.25	2.46	678
Rural Yes	5.33	0.93	3.51	7.15	1.74	283
Rural No	5.59	0.60	4.42	6.77	3.76	1,174

Note: Poverty measures were calculated taking into account the survey design i.e. the strata and primary sampling units. Estimations were done at the household level but considering population weights.
Source: 2002/03 HIES/LSMS.

LIST OF PARTICIPANTS OF THE SURVEY

Report writers:

The World Bank team

Ludovico Carraro	The World Bank consultant
Martin Cumpa	The World Bank consultant

The NSO team

D.Oyunchimeg	Deputy director of the PSSD
Yu.Tuul	Senior officer of the PSSD, PhD in Economics
Ts.Amartuvshin	Officer of the PSSD
B.Enerelt	Officer of the PSSD

Translation editor:

B.Munkhjargal	Senior officer of the NSO in charge of foreign affairs

Technical consultants:

Valerie Evans	The World Bank consultant
Ludovico Carraro	The World Bank consultant
Martin Cumpa	The World Bank consultant
Juan Munoz	The World Bank consultant

Steering commitee:

P.Byambatseren	Chairman of the NSO, head of the steering committee
N.Gerelsuren	Former parliament member
S.Chinzorig	National director of the project "MON/01/U01", Poverty research and employment facilitation for policy development, former vice minister of the Ministry of Social Welfare and Labor
Ch.Khurelbaatar	СЯ-ны төрийн нарийн бичгийн дарга
B.Bayart	Director of Information monitoring and evaluation department of the Ministry of Health
N.Narangerel	Director of Population and social department of the Ministry of Social Welfare and Labour
J.Jargalsaikhan	Director of General policy and planning department of the Ministry of Finance
Ts.Gelegjamts	Head of Monitoring, evaluation, and pressing coordination division of the Ministry of Education, Culture and Science
P.Bolormaa	National coordinator of the project MON/01/U01

j.Demberelsuren	ЭМЯ-ны харьяа Нийгмийн эрүүл мэндийн хүрээлэнгийн сургалтын албаны дарга
D.Narmandakh	Vice President of Mongolian Trade Unions
M.Sarantuya	Expert of UNDP
V.Tsolmon	Officer of the World Bank

Survey working group at the NSO:

Head of the working group D.Oyunchimeg	Deputy director of the PSSD, NSO
Members: Yu.Tuul	Senior officer of the PSSD, NSO PhD in Economics
Ts.Amartuvshin	Officer of the PSSD, NSO
P.Baigalmaa	Officer of the DPSDD, NSO
L.Ganzaya	Officer of the PSSD, NSO
L.Myagmar	Officer of the DPSDD, NSO
B.Sarangerel	Senior officer of the MBSD, NSO
Ch.Enkhbayar	Officer of the PSSD, NSO
B.Enerelt	Officer of the PSSD, NSO

Field staff for the LSMS:

Supervisors

Ts.Amartuvshin	S.Jambaldorj	B.Tuul
Ch.Ganchimeg	S.Oyuntsetseg	Yu.Tuul
G.Jiidiimaa	B.Sarangerel	Ts.Chimeddorj

Interviewers

N.Altantuya	P.Delgermuron	Kh.Tumorsukh
M.Altantsetseg	Ts.Davaa-Ulzii	B.Khumbaa
B.Batbayar	Sh.Dorjkhand	G.Kherlen
Ts.Batbayar	A.Zolboo	B.Chuluuntsetseg
G.Batbuyan	O.Itgel	L.Elbegsaikhan
S.Bat-Oyun	D.Odgerel	Ch.Enkhbayar
M.Ganbayar	B.Oyuntuya	D.Enkhjargal
G.Davaasuren	Kh.Oyuntsetseg	B.Enerelt
Yu.Alt-Ochir		

Field staff for the HIES:

Arkhangai aimag: Supervisor B.Chuluuntsetseg

Interviewers:	Ts.Tserensodnom	Ch.Sarantuya	D.Batsaikhan
	P.Gombodorj	B.Dalaitsogt	B.Batbilegt
	S.Rentsenbal	D.Narantuya	

Bayan-Ulgii aimag: Kh.Umirzakh

Interviewers:	A.Shepen	Kh.Emusiz	Kh.Beisen
	B.Estai	A.Khajiimurat	Kh.Khabiil

Bayankhongor aimag: Supervisor Kh.Oyunchimeg

Interviewers:	T.Elbegdorj	L.Gal	B.Davaasuren
	P.Gerelee	A.Batbold	N.Tsetsgee
	D.Amgalan		

Bulgan aimag: Supervisor Ch.Ariun

Interviewers:	Ts.Batsaikhan	Ch.Buyankhishig	G.Tsogt
	O.Otgonsuren	S.Uurtsaikh	Ts.Batbayar

Govi-Altai aimag: Supervisor L.Ariuntuya

Interviewers:	M.Enebish	B.Jargalsaikhan	J.Chantsaldulam
	Sh.Myanganbayar	Sh.Guliraanz	

Dornogovi aimag: Supervisor D.Munkhtuya

Interviewers:	Ch.Narangerel	D.Banzragch	Yo.Kolya
	Sh.Gantsetseg		

Dornod aimag: Supervisor D.Enkhbaatar

Interviewers:	Z.Tsendem	G.Tsend-Ayush	D.Tuyatsetseg
	M.Altantsetseg	G.Tsolmon	

Dundgovi aimag: Supervisor G.Bayasgalan

Interviewers:	Ts.Dorjpagma	J.Zorigt	N.Tsetsegmaa
	B.Munkhbayar	Ts.Erdenebayar	

Zavkhan aimag: Supervisor S.Suvdaa

Interviewers:	B.Damlansuren	N.Janchiv	J.Bazarvaani
	R.Davaajantsan	G.Odkhuu	Sh.Michiddorj
	D.Oyungerel		

Uvorkhangai aimag: Supervisor B.Delger

Interviewers:	Ch.Galbadrakh	Ts.Biziya	B.Urtnasan
	J.Dalantai	L.Gantulga	D.Dolgorsuren
	Ts.Tsoodol	Yo.Dugersuren	

Umnogovi aimag: Supervisor Ts.Jugarsuren

Interviewers:	D.Doljin	G.Tsevelsuren	J.Tsoodol
	D.Uulii		

Sukhbaatar aimag: Supervisor Ts.Khad

Interviewers:	A.Davaasuren	B.Ankhbayar	Z.Ichinkhorloo
	L.Avaadorj	N.Gombosuren	

Selenge aimag: Supervisor N.Oyunaa

Interviewers:	S.Luvsanperenlei	Ts.Baigalmaa	D.Enkhtuya
	G.Tsetsegmaa	P.Chuluuntsetseg	P.Gejee
	D.Otgon		

Tuv aimag: Supervisor S.Undrakhbayar

Interviewers:	S.Dulamsuren	D.Ayush	L.TSogtgerel
	O.Damdinjav	Ch.Sukhbaatar	Sh.Tsagaankhuu
	D.Otgonbaatar	Ch.Battsesem	

Uvs aimag: Supervisor D.Erdene

Interviewers:	Z.Bumnanjid	B.Davaa	Kh.Namsrai
	T.Tsevegmed	G.Munkhbat	S.Lhagvasuren
	B.Tsevegmed		

Khovd aimag: Supervisor A.Badamgarav

Interviewers:	T.Chuluunbaatar	Ch.Bereevenjav	Ch.Batnasan
	Ch.Dorj		

Khuvsgol aimag: Supervisor Ch.Barsbold

Interviewers:	L.Enebish	V.Enkhtuya	B.Dovchindorj
	D.Batjargal	G.Bagsamshin	T.Altantsetseg
	S.Altanchimeg	M.Saikhanbayar	S.Narantsetseg
	L.Unorsaikhan		

Khentii aimag: Supervisor B.Gantugs

Interviewers:	E.Tsetsegdelger	B.Narantsetseg	E.Chimegbaatar
	D.Oyun-Erdene	S.Tumurtogoo	B.Oyunbaatar
	Ch.Sarantuya		

Darkhan-Uul aimag: Supervisor Z.Amarsaikhan

Interviewers:	S.Enkh-Amgalan	Sh.Roza	L.Jamiyansuren
	B.Urtnasan	M.Nansalmaa	Ch.Oyungerel
	D.Tserendulam		

Orkhon aimag: Supervisor B.Tuul

Interviewers:	Ch.Darvadorj	S.Lhagvasuren	B.Olzvoi
	Ch.Oyunbileg		

Govisumber aimag: Interviewer: Ts.Narantsatsral

Ulaanbaatar city: Supervisor: B.Tuul

Bayangol district: Supervisor Yu.Altantuya

Interviewers:	Yu.Altantsetseg	E.Tumendemberel	Ts.Mandal
	N.Dumbormaa	T.Soyolmaa	Ch.Munkhbaatar
	T.Narangarav		

Songinokhairkhan district: Supervisor D.Enkhbayar

Interviewers:	L.Yanjmaa	Ts.Chimeddorj	A.Batsaikhan
	S.Ulziisaikhan	B.Khombogo	D.Dolgorsuren
	S.Uranchimeg		

Bayanzurkh district: Supervisor D.Narangerel

Interviewers:	A.Adiya	D.Urantsetseg	T.Mungonshagai

	J.Tsogtsolmaa	G.Ariuntuya	N.Bazargardoo
	Yu.Alt-Ochir		

Chingeltei district: Supervisor Ch.Oyunjargal

Interviewers:	S.Sodgerel	B.Tungalag	Ts.Tuya
	J.Galya	G.Enkhjargal	

Sukhbaatar district: Supervisor B.Khandmaa

Interviewers:	J.Gantumor	S.Urjinbadam	S.Tsogt-Ochir
	Kh.Enkhbulag		

Khan-Uul district: Supervisor Ts.Enkh-Oyun

Interviewers:	Ts.Oyunbat	Ts.Oyuntsetseg	D.Mijiddorj
	J.Ayurzana		

Nalaikh district:

Interviewers:	A.Gantsetseg	Sh.Erdenechimeg

Baganuur district:

Interviewers:	D.Jargalmaa	D.Enkhbaatar

Data entry persons:

R.Delgermuron
S.Tserensoli
G.Erdenetsetseg
P.Yanjmaa