





POVERTY MEASURES FOR 2019 IN THE REPUBLIC OF MOLDOVA

June 2020

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Preface

The National Bureau of Statistics of the Republic of Moldova asked support from the World Bank in the revision of the national poverty measures derived from the Household Budget Survey in relation to updated population estimates and new approaches to consider the usual resident population. Moreover, it also asked for technical assistance in the analysis of the 2019 HBS, which used a new sampling frame and made some significant questionnaire changes. OPM was selected to provide this technical support given previous involvement on poverty measurement in the country.

The main objective of this report is to provide the poverty estimates for 2019 and a simple poverty profile as well as assess their comparability with previous estimates.

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List of abbreviations

| GNI | Gross National Income | |
|-----|-----------------------|--|
| | | |

- MIQ Minimum Income Question
- HBS Household Budget Survey
- NBS National Bureau of Statistics
- PPP Purchasing Power Parity

1 Introduction

The Household Budget Survey (HBS) is the main source for the measurement of poverty in the Republic of Moldova. In particular, it has been used to set the national poverty line, for official poverty measurement and as the main source of analysis to understand the impact of various socio-economic policies on poverty.

The HBS provides comprehensive information on living standards through the collection of households' income and consumption data, as well as non-monetary indicators covering education, health, employment, housing, asset ownership, and self-assessed living conditions.

As discussed and analyzed in a recent note about the 2019 HBS¹, the survey operations have seen significant changes compared to previous years, most importantly on the sampling frame, but also on questionnaire design. The conclusion from an in-depth analysis of the data is that 2019 statistics is not comparable with previous years. This is true also for poverty estimates. Nevertheless, it is important to specifically assess implications for the poverty line, generate poverty estimates for 2019 and determine whether anything can be said about poverty changes.

The remainder of this note is organized as follows. In the next section we provide poverty and inequality estimates for 2019 and then look at the poverty profile. In section four we try to work with a revised welfare aggregate that was not affected by questionnaire changes, and look at poverty changes between 2017 and 2019.

2 Poverty and inequality measures in 2019

In the Republic of Moldova official poverty measurement uses consumption expenditure as the underlying welfare indicator for poverty measures. In 2019 the questionnaire incorporated a number of changes that should better measure consumption for welfare analysis. In particular, the questionnaire has a combination of 'factual' expenditure registration during the month of interview collected in a diary, and a set of recall questions to better capture expenditure on items that are less frequently consumed. The section on recall expenditure is specifically important when the objective is to make inter-household comparisons, as in the case of poverty and inequality analysis. In 2019 more items have been included in the recall module. These are related to expenditure on transportation, education services, and school supplies, as well as more detailed information for some recreational expenses and medical services. For all such items, the expectation is that, compared to ten years ago, more households incur such expenses, and so it is important to better capture and account for them. However, since they are expenditure items that do not necessary occur on a monthly basis, their inclusion is more appropriate in the recall module.

Reflecting changes in the questionnaire design, the construction of the consumption aggregate for poverty analysis has been revised to fully utilise all the available information. Furthermore, since changes in the questionnaire have triggered a review of the composition of the consumption aggregate for poverty analysis, it was also decided that it is preferable to exclude health expenditure from the aggregate. Indeed, inclusion of health expenditure is often debated. Higher health expenditure is required when you are in need of medical services, but other things equal it is problematic to say that one with higher health expenditure is better off than another who did not have such need. Indeed the opposite is more likely to be true. Only preventive health expenditure could be considered positively, but we do not have sufficient information to make such distinction.

Moreover, data analysis for Moldova shows that the inclusion of such expenditure over-estimates the welfare of persons with disabilities, the elderly and those with specific health conditions

¹ <u>https://statistica.gov.md,</u> Metadata / Statistical Methodologies / Living standards of population

(chronic diseases). Therefore, it was decided that it is preferable to drop health expenditure from the consumption aggregate when analysing poverty.

The inclusion of new recall items and the dropping of health expenditure change the composition of the consumption aggregate and this, together with the use of a new sampling frame, could have a potential impact on the poverty line. Indeed, we should remember that, while the food poverty line is determined based on a fixed food basket², the non-food component is set in relative terms, i.e. based on the observed levels of non-food expenditure of households who spend for food an amount equivalent to the food poverty line. Therefore, changes in the non-food expenditure could have an important consequence on the level of the poverty line.

The current poverty line was set using 2016 data and was calculated as 1819.2 lei per month per adult equivalent. This line updated by the increase in the consumer price index is equivalent to an amount of 2095.1 in 2019. Moreover, also the lower or extreme poverty line is maintained. This is equivalent to 1689.7 in 2019 prices.

Table 1 shows the percentage of the population falling below the extreme and absolute poverty line as well as the poverty gap and severity of poverty measured for the same two lines³. Overall, the percentage of poor is 25.2% using the absolute poverty line and 10.7% for the extreme poverty line.

| | Extreme poverty | Absolute poverty |
|---|-----------------|------------------|
| Poverty line (monthly per adult equivalent) | 1689.7 | 2095.1 |
| Percentage of poor | 10.7 | 25.2 |
| Poverty gap | 1.21 | 3.68 |
| Severity of poverty | 0.30 | 1.02 |

Table 1 Absolute and extreme poverty in 2019

We can also look at inequality using three common measures: the Gini coefficient, the ratio between the 90th and 10th percentile of the distribution, and the ratio between the 75th and 25th percentiles. The Gini coefficient takes values between zero and one, whereby zero is theoretically achieved when everyone has the same level of welfare, and on the opposite a value of one would occur if just one person has all the welfare and the rest of the population none.

Moreover, we calculate such measures using different welfare indicators: consumption without health expenditure (this is the indicator used for poverty measures), full consumption aggregate and income. All these three measures are computed in per capita or per adult equivalent measures. In all cases the aggregate is corrected by price differences (regional as well as temporal differences).

Results are provided in Table 2, where we can see that per adult equivalent measures always have lower inequality than per capita ones. Moreover, income has significantly higher inequality than consumption, and for the latter the aggregate without health has the lowest inequality. In general a Gini coefficient of about 0.25 shows a relatively low level of inequality, but for income per

² The food basket is defined to achieve a certain minimum calorie intake reflecting the food consumption patterns existing in the country.

³ These poverty measures are commonly used and belong to Foster, Greer and Thorbecke class of measures, based on their 1984 article and also referred as FGT measures. More detailed explanations can be found in this previous <u>NBS</u> publication.

adult equivalent the Gini coefficient reaches 0.303. In countries of the European Union the average Gini coefficient measured using income per adult equivalent was 0.308⁴ in 2018. Significantly higher levels of inequality are found in the United States and China (about 0.4) and even higher in some Latin American countries (0.5 in Brazil) and South Africa (more than 0.6).

| Table 2 mequality measures in 2013 |
|------------------------------------|
|------------------------------------|

| | Gini | p90/p10 | p75/p25 |
|-------------------------------------|--------|---------|---------|
| Consumption expenditure for poverty | | | |
| Per capita consumption | 0.2474 | 2.973 | 1.751 |
| Per adult equivalent consumption | 0.2378 | 2.829 | 1.694 |
| Consumption expenditure | | | |
| Per capita consumption | 0.2535 | 3.040 | 1.771 |
| Per adult equivalent consumption | 0.2425 | 2.902 | 1.735 |
| Disposable income | | | |
| Per capita income | 0.3148 | 4.013 | 2.061 |
| Per adult equivalent income | 0.3027 | 3.834 | 2.038 |

3 Poverty profile

Beyond the country level measures of poverty, an analysis of poverty is useful when it generates a poverty profile, i.e. it looks at differences in poverty levels across geographical areas, different household types, socio-economic groups, and other relevant characteristics.

Detailed tables are reported in the annex, but here we draw attention to some of the most relevant findings. The first concerns disparities in the level of poverty by geographical areas. Key estimates are provided in Figure 1 where we see how poverty in rural areas is three times higher than in urban areas and also that across different regions poverty appear significantly higher in the south of the country, whereas it is very low in Chisinau.

Figure 2 instead looks at the percentage of poor across different household types, which includes single persons, couples, households with children, and other households. Poverty incidence varies significantly, it is the lowest among single member households aged less than 60, with just 13% of poor people, and the highest among single member households aged 60 and above and households with three or more children at 38%. The percentage of poor among single parents is higher than that of couples with children, but not as high as one would have expected. However, observations for such group of households are relatively few and so estimates should be taken with caution.

⁴ See Eurostat statistics at <u>https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di12&lang=en</u>









It is also interesting to look at poverty rates across some characteristics of the household head, namely the main source of income of the household head and the level of education achieved by the household head.

Looking at the main source of income, there are clear significant differences with agricultural income (either as farmers or paid employment) associated to clearly higher levels of poverty and perhaps reflecting also the disparities between urban and rural settings. Moreover, poverty is very high also among pensioners and those receiving other sources of income (primarily social assistance). On the other hand, receipt of remittances reduces significantly poverty levels (see Figure 3).

Finally, Figure 4 looks at the education of the household head, unsurprisingly there is a negative link between education and poverty, with progressively higher education resulting in lower poverty levels. Nevertheless, some of the disparities in poverty levels are extremely large, with a poverty

rate of almost 80% if the household head achieved only primary education or less and in contrast a poverty rate of only 5% if the household head has higher education (university degree or higher).





Figure 4: Percentage of poor by education of the household head



More estimates are provided in the annex also for individual level estimates by sex, age groups, education and personal income sources (for people 18 and above).

4 **Poverty and inequality changes over time**

While the above poverty figures are not directly comparable with previous estimates, it is important to assess whether we can analyse data of 2019 and previous years for a subset of the data where there have not been questionnaire modifications and so, barring changes due to sampling, we might achieve an assessment of how poverty levels moved over time.

As discussed also in the note about the 2019 data, one critical questionnaire change that hinders comparison of consumption data between 2019 and previous years is the different period in which people were asked to keep information about food expenses. All households interviewed need to keep a diary for a month where they record income, expenditure and consumption from in-kind production or stock. However, recording of food expenses is only done for half a month. While until 2018 about half of the sample was recording such expenses in the first part of the month and another half was recording them in the second part of the month, in 2019 all households recorded such expenses in the first part of the month. We have found that households recording expenses in the first half of the month tend to report higher food consumption expenditure, and these differences remain even after controlling for different household characteristics. Therefore, in order to ensure comparability, we have worked with a subset of households interviewed in 2017 and

2018, and maintained only those keeping the diary for food expenses in the first half of the month⁵. This has the inevitable consequence to provide new poverty estimates for 2017 and 2018, which differ from those published before, but with the only scope of comparing poverty levels with those in 2019.

Furthermore, to ensure comparability, we have made a number of changes also in the 2019 consumption aggregate. In particular we have not included the consumption expenditure from the new recall items (transportation, recreation, education and school supplies). Moreover, we also excluded medical equipment and medical services (medical services, dentists, laboratory, physiotherapist, etc.), but kept expenditure for medicines and hospitalization charges, which have been captured in the same way in 2019 and previous years.

The above modifications to the consumption aggregates of 2017, 2018 and 2019 ensure that for these years the questions and methods used to define the aggregates are the same. While there could be still an effect due to the new sampling frame used in 2019, we can now still make a comparison and try to interpret the results. Using these revised and theoretically comparable consumption aggregates, Figure 5 shows the percentage of people falling below the 2016 and 2006 poverty lines, or respectively the absolute and extreme poverty lines. As previously found 2018 poverty estimates are significantly lower than those of 2017, but it is interesting to find that in 2019 poverty appears to have increased. Given that previous analysis of 2019 data showed that, in average terms, the sample identified relatively better-off households compared to previous surveys, the expectation was for a further poverty reduction, but the result for the tail of the distribution goes in the opposite direction or find a relatively stable level of poverty.





⁵ After dropping half of the sample sampling weights were adjusted and scaled up at the primary sampling unit level to ensure that they still provide the same population estimate.

5 Alternative poverty lines

While the official poverty line has been established using the cost of basic needs approach, this section looks also at alternative ways to set the poverty line, i.e. the subjective poverty line, and other existing minimum standards: the subsistence minimum and the international absolute poverty lines.

5.1 Subjective poverty line and equivalence scales

The assessment of a 'subjective poverty line' makes use of answers to the 'minimum income question' (MIQ), whereby each household is asked to report a monthly amount of income that would meet their essential needs. Such method was pioneered in the Netherlands by Van Praag (1968). The HBS questionnaire asks such question by firstly enquiring about the income that would allow the household to live a 'decent life' and then the income that meets their basic necessities. The latter has been used for this analysis.

However, the approach to identify the poverty line does not simply take an average of people's answers to such question, but requires a more sophisticated analysis. In particular, it is expected that the answers to the MIQ will be an increasing function of actual household income. The poverty line is usually determined at the intersection between the declared minimum subjective income and the actual income, adjusting for household characteristics that influence this relationship. A simplified relationship between minimum income and actual income is depicted in Figure 6.



Figure 6: The subjective poverty line

The estimation of the subjective poverty line requires to estimate a regression model in which the subjective minimum income is estimated as a function of actual income, household composition variables, and other variables that could influence the answer to the MIQ⁶.

Moreover, determining the subjective poverty line using the regression model also allows the estimation of economies of size and equivalence scales, since the subjective poverty line can be computed for different household types. The advantage of this methodology is that it calculates unconditional equivalence scales and focuses specifically at the lower part of the distribution, thus making it particularly useful for poverty analysis (see for example Garner and Short (2002)).

However, we should point out that 'subjective parameters' might differ from what theoretical needs are. In fact, people's own assessment of needs depends on their circumstances and especially for some groups this could result in an under-estimation of needs.

Applying such methodology, the estimated poverty line per adult equivalent is 2307.5. This is higher than the current poverty line of 2095.1. Nevertheless, it is important to remember that the minimum income question does not discriminate between required expenses. Therefore, implicitly it includes health expenditure and also durable items and housing (rent), all items that have been excluded from the consumption aggregate for poverty analysis. Taking this into account, the estimate coming from the subjective assessment is not very different from the one estimated using the cost of basic needs approach.

Details of the regression models and the equivalence scale estimated using such approach are provided in Annex B.

5.2 Subsistence minimum

Besides the official poverty line, in Moldova there is also a separate calculation of the so called 'subsistence minimum'. The subsistence minimum is estimated using a mix of normative standards and survey-based estimates coming from the HBS. The normative standards prescribe a certain food basket to be consumed by people depending on age and sex of the person in working age. The food basket is priced based on official price statistics for large cities, other urban areas and rural areas. The non-food component is determined based on the estimated average food share in the country.

In the past the subsistence minimum level was significantly higher than the cost of basic needs poverty line (30-40% higher), but since the new poverty line was estimated using 2016 HBS data, the difference between the two approaches is very small. In 2019 the average subsistence minimum for the country is 2031.2, while the cost-of basic needs poverty line is 2095.1 a bit higher than the subsistence minimum.

Since the two approaches now yield very similar results, it would be appropriate to avoid confusion and use only one poverty line.

Currently the subsistence minimum is computed twice a year, for large cities, other towns and rural areas and also for different persons (based on age and sex). However, such estimates can also be generated for the official poverty line.

⁶ It is generally also necessary to adjust for a potential selectivity bias if there are households who do not answer the MIQ.

In particular, different poverty lines could be computed using the Paasche price index computed as part of the poverty analysis. Similarly the same index could be generated for the first part and second part of the year. Finally, using equivalence scales it could also be possible to generate different poverty lines for children, adults and elderly. However, before conducting such calculations it would be important to determine the specific use of the subsistence minimum and understand whether such disaggregation is really necessary.

5.3 International poverty lines

Finally, whenever we are interested in country comparisons, it is common to use international poverty lines. These are developed by the World Bank and expressed in certain amount of USD dollars per day in purchasing power parity (PPP). Currently these poverty lines are the \$1.9/day PPP poverty line used primarily by low income countries, the \$3.2/day used primarily in lower-middle-income countries and \$5.5/day used in upper-middle-income countries.

The classification of countries is made by the World Bank using the Gross National Income (GNI) per capita (current US\$)⁷. The threshold for upper-middle income countries in 2018 was 3896 \$ (1st of July) and became 3996 on the 1st of July 2019. In 2018 Moldova's GNI was 3900⁸ and so just on the threshold between a lower-middle and upper-middle income country. Therefore, both the \$3.2 and \$5.5 dollar a day poverty lines would be acceptable in the case of Moldova.

However, in order to compute correctly these poverty lines it is important to use the PPP exchange rate. Such an exchange rate is computed only in some years to try and take into account the price differences across countries and essentially construct a comparable international price index. In many countries the PPP exchange rate is rather different from the official exchange rate.

The last calculation of PPP exchange rates was done in 2011 and \$1 in PPP was estimated to be equivalent to 5.451 Lei. Therefore, the poverty line is computed in 2011 prices using such exchange rate and then the resulting line is updated to the prices of 2019. The daily poverty line should also be expressed in monthly terms (multiplying by 365/12).

In 2011 the line of \$5.5 PPP is equal to 911.9 lei per month, which in 2019 is equivalent to 1409.6 lei. For \$3.2 PPP the line is respectively 530.6 in 2011 and 820.1 in 2019.

Finally, in international comparisons these lines are used to measure poverty in terms of per capita income or consumption adjusted by regional price differences. This means that rather than computing per adult equivalent consumption, it is necessary to use per capita measures when using international poverty lines.

Table 3 shows the estimated percentage of people with a per capita consumption below the \$3.2 and \$5.5 PPP international poverty lines.

⁷ This is calculated using the Atlas method, which is a way to smooth exchange rate fluctuations by taking a 3 year moving average.

⁸ See https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=MD

| | 3.2\$ PPP | 5.5\$ PPP |
|------------------------------|------------|-------------|
| Poverty line (Lei per month) | 820.1 | 1409.6 |
| Urban Rural | 0.1 0.8 | 4.5 18.5 |
| Total | 0.5 | 12.9 |

Table 3 Percentage of people falling below international poverty lines, 2019

Annex A Detailed statistical tables

| Indicator | Compa | 2010 | | |
|-----------------------------------|--------|--------|--------|--------|
| | 2017 | 2018 | 2019 | 2019 |
| Absolute poverty (2016 poverty l | ine) | | | |
| Poverty line | 1939.3 | 1998.4 | 2095.1 | 2095.1 |
| Head count (% of poor populatio | n) | | | |
| Total | 26.6 | 22.0 | 22.9 | 25.2 |
| Urban | 10.5 | 11.6 | 10.7 | 11.2 |
| Large cities | 6.3 | 8.3 | 4.4 | 4.9 |
| Other urban | 16.3 | 16.3 | 19.1 | 19.7 |
| Rural | 38.1 | 29.3 | 31.0 | 34.5 |
| Other poverty measures: | | | | |
| Poverty gap | 3.81 | 2.65 | 3.16 | 3.68 |
| Severity of poverty | 1.08 | 0.68 | 0.86 | 1.02 |
| Extreme poverty (2006 poverty lin | ne) | | | |
| Poverty line | 1564.0 | 1611.7 | 1689.7 | 1689.7 |
| Head count (% of poor populatio | n) | | | |
| Total | 11.4 | 7.2 | 9.1 | 10.7 |
| Urban | 2.8 | 2.8 | 3.4 | 3.6 |
| Large cities | 1.2 | 2.0 | 2.0 | 1.7 |
| Other urban | 4.9 | 4.0 | 5.4 | 6.2 |
| Rural | 17.5 | 10.2 | 12.9 | 15.3 |
| Other poverty measures: | | | | |
| Poverty gap | 1.28 | 0.77 | 1.00 | 1.21 |
| Severity of poverty | 0.33 | 0.19 | 0.24 | 0.30 |

Table 4 Poverty measures using absolute and extreme poverty lines, 2019 and 2017-2019using a comparable aggregate

Note: Figures for 2017 to 2019 using a comparable aggregate were only made to assess poverty in 2019 compared to previous years. However, official poverty measures remain for 2017 and 2018 remain those published in the Analytical Note for 2014-2018. Similarly the poverty measure for 2019 that sets a new baseline is the one reported in the last column in bold.

| | Using comparable welfare aggregate | | | | | | | % of | Distr. of |
|-----------------------|------------------------------------|--------|------|---------|--------|--------|---|------|-----------|
| _ | % | of poo | r | Distrib | uton o | f poor | - | poor | poor |
| Population sub-groups | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 | | 20 |)19 |
| Urban and rural | | | | | | | | | |
| Urban | 10.5 | 11.6 | 10.7 | 16.4 | 21.6 | 18.5 | | 11.2 | 17.7 |
| Rural | 38.1 | 29.3 | 31.0 | 83.6 | 78.4 | 81.5 | | 34.5 | 82.3 |
| Total | 26.6 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | | 25.2 | 100.0 |
| Zone | | | | | | | | | |
| North | 30.0 | 28.6 | 24.2 | 31.1 | 35.4 | 29.5 | | 27.7 | 30.7 |
| Centre | 38.2 | 26.1 | 28.2 | 42.8 | 35.4 | 36.6 | | 29.7 | 35.0 |
| South | 30.1 | 26.9 | 36.7 | 21.2 | 23.3 | 30.2 | | 40.4 | 30.2 |
| Chisinau | 5.4 | 5.4 | 3.7 | 4.9 | 5.8 | 3.8 | | 4.4 | 4.1 |
| Total | 26.6 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | | 25.2 | 100.0 |

Table 5 Absolute poverty by geographical areas, 2019 + 2017-2019 comparable aggregate

Note: Figures for 2017 to 2019 using a comparable aggregate were only made to assess poverty in 2019 compared to previous years. However, official poverty measures remain for 2017 and 2018 remain those published in the Analytical Note for 2014-2018. Similarly the poverty measure for 2019 that sets a new baseline is the one reported in the last column in bold.

| | Using comparable welfare aggregate | | | | | % of | Distr. of | |
|------------------------------|------------------------------------|--------------|--------------|---------------------|-------------|-------------|-----------|----------------------|
| - | % | of poo | r | Distributon of poor | | | poor | poor |
| Population sub-groups | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 | 2 | 2019 |
| Number of hh members | | | | | | | | |
| One member | 20.5 | 16.2 | 23.3 | 9.0 | 10.0 | 13.4 | 28. | 0 14.6 |
| Two members | 19.8 | 19.1 | 19.7 | 20.8 | 23.9 | 23.3 | 23. | 0 24.7 |
| Three members | 22.1 | 19.4 | 18.9 | 16.7 | 17.0 | 19.0 | 21. | 6 19.7 |
| Four members | 24.2 | 22.0 | 20.9 | 20.8 | 22.8 | 19.8 | 21. | 0 18.1 |
| Five or more members | 49.9 | 35.1 | 37.4 | 32.7 | 26.3 | 24.5 | 38. | 5 23.0 |
| Total | 26.6 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | 25. | 2 100.0 |
| Household type | | | | | | | | |
| Single, <60 | 15.1 | 6.7 | 11.4 | 2.7 | 1.7 | 2.6 | 13. | 0 2.7 |
| Single, >=60 | 24.3 | 23.0 | 31.4 | 6.3 | 8.2 | 10.7 | 38. | 1 11.8 |
| Couple, head <60 | 15.0 | 18.4 | 11.8 | 6.2 | 7.9 | 5.1 | 13. | 0 5.1 |
| Couple, head >=60 | 22.8 | 22.2 | 25.9 | 7.6 | 10.4 | 10.2 | 32. | 6 11.7 |
| Couple with children | 25.1 | 19.9 | 18.4 | 25.2 | 23.8 | 22.7 | 18. | 6 20.9 |
| Single parent with children | 42.1 | 27.1 | 21.5 | 2.8 | 2.2 | 2.4 | 23. | 2 2.4 |
| Other hhs with children | 36.1 | 27.8 | 29.2 | 30.2 | 29.4 | 25.0 | 30 | 0 23.4 |
| Other hhs without children | 28.5 | 23.7 | 27.8 | 19.0 | 16.3 | 21.2 | 31 | 8 22.0 |
| Total | 26.6 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | 25. | 2 100.0 |
| Households with children | | | | | | | | |
| With children | 30.5 | 23.7 | 22.7 | 58.2 | 55.5 | 50.1 | 23. | 3 46.6 |
| With 1 child | 26.6 | 18.4 | 17.7 | 21.2 | 18 5 | 14.8 | 18 | 4 14.0 |
| With 2 children | 25.0 | 24.9 | 20.2 | 20.2 | 23.1 | 19.0 | 20 | 9 17 9 |
| With 3+ children | 55.3 | 34.4 | 38.1 | 16.8 | 13.9 | 16.2 | 38 | 1 147 |
| Without children | 22.6 | 20.2 | 23.1 | 41.8 | 44 5 | 49.9 | 27 | 2 53.4 |
| Total | 26.6 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | 25. | 2 100.0 |
| Sex of HH head | | | | | | | | |
| Male | 26 / | 22.1 | 22 A | 66.0 | 66.3 | 66 5 | 24 | 6 66 2 |
| Female | 20.4 | 22.1 | 24.4 | 34.0 | 22.7 | 33 5 | 24. | 6 33 8 |
| Total | 27.0 | 22.0 | 24.0 22 Q | 100.0 | 100.0 | 100.0 | 20. 25 | 7 100 0 |
| Education of UL bood | 20.0 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | 23. | 2 100.0 |
| | 56 9 | 17 0 | 70.7 | 20 | 20 | 12 | 70 | 2 12 |
| Loss than general | JU.0 | 47.0 26.1 | 20.0 | 25 E | 5.5 2/ 1 | 4.5 25 1 | /0. | 5 4.5 |
| Conoral socondary | 20.0 | 30.1 27.2 | 39.0 72 7 | 21 7 | 10.2 | 17.2 | 43. | 0 J4.4 |
| Vocational education | 29.0 | 27.5 | 25.7 | 21.7 | 22.6 | 20 / | 27. | 10.1 1 200 |
| Specialized education | 15.6 | 23.4 | 2J.2 15 Q | 27.2 | 52.0 6.2 | 0.4 | 17 | 4 29.9 2 06 |
| Higher education | 10.0 | 9.5 1.6 | 2.0 | 2.4 | 2.0 | 9.0 2 E | 17. | 2 <u>5.0</u> 6 27 |
| Total | 2.5 | 4.0 22.0 | 2.9 22 Q | 100.0 | 100.0 | 100.0 | 4. 25 | 7 100 0 |
| Main course of income (IIII | 20.0 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | 23. | 2 100.0 |
| | | A A A | 25.0 | 16.4 | 16.2 | 15.0 | 20 | 1 11 C |
| Contract amplement | 51.Z | 44.4 15 2 | 35.8 22.4 | | 10.2 | 12.U | 38.º | 4 14.0 |
| Daid omployed in agriculture | 20.8 20.4 | 22.2 22.2 | 40.2 | 10.0 | 4.7 | 12.0 | ZZ. | 0 0.9 1 1 0 |
| other paid employees | 59.4 | 52.5 12.1 | 40.3 | 17.0 | 10.2 | 10.2 | 43. | ۲۲۲۵ ۲۲۵۵ |
| Densioners | 13.0 | 13.1 | 11.0 | 1/.3 | 20.0 | 19.3 | 11. | y 17.9 |
| Perisioners | 32.8 20.0 | 24.1 | 32.1 | 33.4 | 28.5 | 34.Z | 38. | 5 3/.U |
| Remittances | 20.8 | 20.8 | 14.0 | 10.4 | 14.2 | 0.3 | 16. | 1 b.b |
| Uner | 42.8 | 50.3 | 44.1 | 5.2 | 5.5 | 4.b | 46. | ∠ 4.4 |
| Iotal | 26.6 | 22.0 | 22.9 | 1100.0 | T00.0 | T00.0 | 25. | z 100.0 |

Table 6 Absolute poverty by HH characteristics, 2019 + 2017-2019 comparable aggregate

Note: Figures for 2017 to 2019 using a comparable aggregate were only made to assess poverty in 2019 compared to previous years. However, official poverty measures remain for 2017 and 2018 remain those published in the Analytical Note for 2014-2018. Similarly the poverty measure for 2019 that sets a new baseline is the one reported in the last column in bold.

| _ | Using comparable welfare aggregate | | | | | % of | Distr. of | |
|-----------------------------|------------------------------------|---------|-------|---------|--------|--------|-----------|----------------|
| _ | % | of poo | r | Distrib | uton o | f poor | poor | poor |
| Population sub-groups | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 | 2 | 019 |
| Sex | | | | | | | | |
| Male | 28.0 | 22.8 | 22.8 | 49.3 | 48.4 | 46.5 | 24.8 | 3 46.0 |
| Female | 25.4 | 21.4 | 23.0 | 50.7 | 51.6 | 53.5 | 25.5 | 5 54.0 |
| Total | 26.6 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | 25.2 | 2 100.0 |
| Age groups | | | | | | | | |
| 0-17 | 30.7 | 24.2 | 23.6 | 25.1 | 24.3 | 23.6 | 24.0 |) 21.8 |
| 18-29 | 28.2 | 23.6 | 20.7 | 14.0 | 13.0 | 10.3 | 21.0 | 5 9.8 |
| 30-39 | 21.4 | 18.9 | 18.5 | 10.2 | 10.3 | 10.6 | 19.2 | 9.9 |
| 40-49 | 28.7 | 22.9 | 22.7 | 15.4 | 14.8 | 13.8 | 23.8 | 3 13.1 |
| 50-59 | 22.2 | 18.6 | 18.1 | 14.9 | 14.9 | 13.8 | 20.7 | 7 14.3 |
| 60+ | 26.9 | 22.9 | 30.1 | 20.4 | 22.7 | 28.0 | 36.8 | 3 31.0 |
| Total | 26.6 | 22.0 | 22.9 | 100.0 | 100.0 | 100.0 | 25.2 | 2 100.0 |
| Education: persons 18 or mo | re | | | | | | | |
| Primary or less | 52.1 | 47.3 | 63.9 | 5.2 | 5.8 | 6.5 | 70.9 | 9 6.4 |
| Less than general | 42.3 | 35.1 | 40.1 | 36.2 | 35.8 | 37.6 | 44.5 | 5 37.1 |
| General secondary | 24.9 | 24.0 | 22.9 | 21.5 | 20.7 | 18.0 | 25.4 | 17.7 |
| Vocational education | 28.0 | 24.0 | 23.5 | 23.0 | 25.6 | 24.0 | 26.7 | 7 24.3 |
| Specialized education | 16.4 | 10.7 | 14.0 | 9.6 | 7.7 | 9.4 | 16.0 | 5 10.0 |
| Higher education | 6.4 | 5.1 | 5.0 | 4.5 | 4.4 | 4.4 | 5.8 | 3 4.5 |
| Total | 25.5 | 21.4 | 22.7 | 100.0 | 100.0 | 100.0 | 25.0 | 5 100.0 |
| Main personal income source | e: pers | sons 18 | or mo | re | | | | |
| Farmers | 47.8 | 41.6 | 34.9 | 18.8 | 16.8 | 14.0 | 37.7 | 7 13.4 |
| Other self-employed | 19.7 | 15.1 | 20.4 | 3.3 | 3.2 | 4.6 | 20.4 | 4.1 |
| Paid employee in agricultu | 39.5 | 27.6 | 36.3 | 7.6 | 7.1 | 8.2 | 39.4 | 1 7.9 |
| Other paid employees | 11.7 | 11.6 | 11.0 | 14.8 | 16.8 | 16.5 | 11.0 | 5 15.4 |
| Pensioners | 30.0 | 24.8 | 31.3 | 31.9 | 32.6 | 37.6 | 38.4 | 40.9 |
| Remittances | 19.6 | 15.5 | 12.9 | 7.5 | 7.9 | 4.9 | 15.3 | L 5.1 |
| Other | 34.8 | 30.2 | 30.0 | 16.2 | 15.6 | 14.3 | 31.2 | 2 13.2 |
| Total | 25.5 | 21.4 | 22.7 | 100.0 | 100.0 | 100.0 | 25.0 | 5 100.0 |

Table 7 Absolute poverty by personal characteristics, 2019 + 2017-2019 comparable aggregate

Note: Figures for 2017 to 2019 using a comparable aggregate were only made to assess poverty in 2019 compared to previous years. However, official poverty measures remain for 2017 and 2018 remain those published in the Analytical Note for 2014-2018. Similarly the poverty measure for 2019 that sets a new baseline is the one reported in the last column in bold. It is also important to point out that total estimates for education and sources of income are different because they only consider population aged 18 years and older.

Annex B Calculation of subjective poverty line and implicit equivalence scales

The regression model to determine the subjective poverty line is estimated for different household types and controlling for location, age of the household head, education, marital status, number of earners and percentage of consumption expenditure coming from own production (the latter is an indicator to adjust for the fact that households with a higher percentage of consumption from own production might under-estimate their income needs, interpreting that primarily as cash income).

The regression model that was used to estimate equivalence scales has the following general framework:

 $\ln(miq) = \beta_0 + \beta_1 \ln(cons) + \beta_i (household type) + \beta_i (control variables) + \varepsilon$

Where 'miq' is the answer value to the minimum income question, 'cons' is the consumption expenditure at the household level, 'householdtype' represent different variables capturing household composition. ϵ is the error term.

Results of such model are reported in Table 8.

Table 8 Regression model for subjective minimum income (logarithm), 2019

| Variables | Coef. | Std. Err. t | F | ⊃>t |
|--|--------|-------------|--------|-------|
| Consumption expenditure (In) | 0.222 | 0.01 | 17.88 | 0.000 |
| One member household in working age | -0.016 | 0.01 | -1.31 | 0.190 |
| One member household in pension age | -0.413 | 0.02 | -24.15 | 0.000 |
| Two member household, both in pension age | -0.556 | 0.02 | -28.13 | 0.000 |
| Three adults household | -0.028 | 0.02 | -1.43 | 0.153 |
| Four or more adults | 0.262 | 0.02 | 15.56 | 0.000 |
| One adult and one child | 0.472 | 0.03 | 16.38 | 0.000 |
| One adult and two or more children | 0.081 | 0.03 | 2.40 | 0.016 |
| Couple with one child | 0.419 | 0.03 | 12.24 | 0.000 |
| Couple with two children | 0.287 | 0.02 | 14.65 | 0.000 |
| Couple with three or more children | 0.469 | 0.02 | 22.90 | 0.000 |
| Three adults and one child | 0.608 | 0.03 | 17.75 | 0.000 |
| Three or more adults and two or more children | 0.447 | 0.03 | 17.83 | 0.000 |
| Four adults and one child | 0.611 | 0.03 | 20.07 | 0.000 |
| Four or more adults and two or more children | 0.559 | 0.04 | 13.32 | 0.000 |
| Age of household head | 0.733 | 0.04 | 16.87 | 0.000 |
| Squared age of household head | 0.002 | 0.00 | 0.84 | 0.399 |
| Number of earners | 0.000 | 0.00 | -0.89 | 0.373 |
| Whether disabled member | 0.007 | 0.01 | 1.02 | 0.309 |
| Head attained primary education or less | -0.052 | 0.04 | -1.47 | 0.142 |
| Head attained incomplete secondary education | -0.039 | 0.02 | -2.46 | 0.014 |
| Head attained secondary (general) education | -0.027 | 0.01 | -2.18 | 0.029 |
| Head attained secondary (vocational) education | 0.014 | 0.01 | 1.05 | 0.296 |
| Female head is divorced | -0.033 | 0.02 | -1.80 | 0.072 |
| Female head is widow | -0.009 | 0.01 | -0.63 | 0.531 |
| Female head is married | 0.093 | 0.01 | 6.56 | 0.000 |
| Female head is single | -0.064 | 0.03 | -2.03 | 0.043 |
| Large cities (Chisinau and Balti) | 0.212 | 0.02 | 13.49 | 0.000 |
| Towns | 0.055 | 0.01 | 4.63 | 0.000 |
| Centre | 0.001 | 0.00 | 0.72 | 0.469 |
| South | 0.005 | 0.01 | 0.34 | 0.735 |
| Constant | 6.404 | 0.12 | 52.67 | 0.000 |
| Number of observations | 4408 | | | |
| R-squared | 0.7841 | | | |
| Root MSE | 0.2759 | | | |

It is important to note that the various control variables are important in determining appropriate comparisons between household types, but do not have to be included in the calculation of subjective poverty lines. Instead, subjective poverty lines for different household groups were computed using the following formula:

$$Pline_{i} = \exp\left(\frac{\beta_{0} + \beta_{i}Htype_{i} + 0.5\sigma^{2}}{1 - \beta_{i}}\right)$$

And such values were then adjusted multiplying by the ratio of the mean subjective household poverty line (using all explanatory variables) and the weighted sum of the above poverty lines.

The household specific poverty lines can also be used to calculate indirectly equivalence scales. For example by comparing the poverty line for one person household and that of two adults, we can see the equivalence scale of a second adult, and using the poverty line for a three adult household estimate the equivalence of a further adult member. Similarly, comparing the line for a couple with that of a couple with one child can reveal the implicit equivalence of a child. Such

analysis is presented in Table 9. It is significant to note that compared to similar calculations done using the 2006 data, we do not find evidence of significant economies of size and no evidence of lower needs for children compared to adults. While in 2006 a second adult had an equivalence scale of about between 0.63 and 0.72, in 2019 it is between 0.87 and 0.95. For children in 2006 it was between 0.46 and 0.66 for households with one or two children and it is now between 0.92 and 1.06. Therefore, while in 2006 such calculations were close to the old OECD equivalence scales, 2019 estimates would suggest almost not differences between the first and other adults and between children and adults.

| | Subj. | Implicit equivalence scales | | | % | |
|--------------------------------------|--------------|-----------------------------|-------|---------|-----------|-----|
| | poverty line | Adult | Child | Elderly | (sum=100) | Obs |
| One adult | 2307.5 | 1 | | | | |
| Working age | 2640.6 | | | | 5.77 | 346 |
| Pension age | 2103.6 | | | 0.91 | 14.89 | 963 |
| Two adults | 4505.0 | 0.95 | | | | |
| Working age | 4553.9 | 0.72 | | | 14.45 | 766 |
| Pension age | 4393.5 | 1.09 | | 0.98 | 9.88 | 634 |
| Three adults | 6511.2 | 0.91 | | | 11.5 | 345 |
| Four adults (or more) | 8360.7 | 0.87 | | | 7.95 | 100 |
| Adult and one child | 5140.2 | | 0.95 | | 2.58 | 79 |
| Adult and two (+) children | 8132.2 | | 1.04 | | 1.99 | 91 |
| Couple and one child | 6961.4 | | 1.06 | | 8.98 | 293 |
| Couple and two children | 8748.0 | | 0.92 | | 6.19 | 275 |
| Couple and three (+) children | 9775.8 | | 0.76 | | 1.48 | 80 |
| Three adults and one child | 8210.1 | | 0.74 | | 6.15 | 169 |
| Three adults and two (+) children | 9902.6 | | 0.73 | | 2.96 | 125 |
| Four (+) adults and one child | 9077.6 | | 0.31 | | 3.38 | 70 |
| Four (+) adults and two (+) children | 11101.6 | | 0.59 | | 1.83 | 72 |

Table 9: Implicit equivalence scales from subjective household poverty lines in 2019

The finding on the different set of equivalence scales, or the lack of evidence that these are indeed required is an area that would require more research.