MEASURING POVERTY IN ARMENIA: METHODOLOGICAL EXPLANATIONS

Since 1996, when the current methodology for surveying well being of households was introduced in Armenia, the National Statistical Service of Armenia, with support from the World Bank, USAID and other donors, has continuously made efforts to improve the quality of household level data it collects and build in-house capacity to accurately measure poverty. Those are important efforts, as data from household surveys and poverty measurement results based on them provide significant inputs into the formulation and monitoring of poverty reduction policies to which Armenian Government is committed.

Recently, the NSSA has taken important steps to improve the Armenia Integrated Leaving Conditions Survey (ILCS) and bring the poverty measurement methodology it applies up to date. With technical assistance from the World Bank provided through a series of consultations and hands-on-training over the period September 2003-November 2005: (1) the sample frame for the Integrated Leaving Conditions Survey was updated using the 2001 Population Census data; (2) the sample size was expanded, so as to make the ILSC representative at the regional (*marz*) level; (3) the ILSC questionnaire was revised to account for economic and social changes since 1998/99 and an extensive labour module was added to the survey; and (4) the staff involved in ILCS implementation was better trained. This improved ILCS was launched in 2004 with the actual data collection taking place in the period between April 1, 2004 and March 31, 2005.

The NSSA has also adjusted its methodology for poverty measurement and further improved capacity to measure and analyze poverty trends and the socio-economic situation. This adjusted methodology is applied to the 2004 ILCS. In comparison with the poverty measurement methodology used so far by the NSSA, the adjusted one has the following new features: (i) it is based on a *broader measure of the consumption* aggregate, which now includes, besides standard food and non-food components, estimates of the rental value of durables—the value of the flow of services from durables owned by a household; (ii) the consumption aggregate is adjusted for differences in the consumption of adults and children, and adjusted for shared household expenditures: the *consumption per adult equivalent* is measured, instead of applying the previously used per capita approach; and, (iii) a *new minimum food basket* is developed based on the 2004 ILCS. The 2004 minimum food basket is used to calculate the extreme (food) poverty line for 2004. This line, appropriately adjusted for inflation, will continue to be used as a benchmark for poverty measurement over the next several years.

This section describes in detail the Armenian ILCS for 2004. It also describes construction of the welfare aggregate, equivalence scales and size economies estimates, as well as the methodology for setting the poverty lines.

1. The Armenian Integrated Living Conditions Survey

The Integrated Living Conditions Survey (ILCS) was introduced in Armenia in 1996 and has been carried out in the following years: 1998/99, 2001, 2002, 2003 and 2004. These surveys were conducted with monthly rotation of households and settlements. The survey results serve primarily to assess the level of consumption-based poverty in the country.

(i) Sampling frame

The sampling frame for the 2004 ILCS was built using the database of addresses for the 2001 Population Census; the database was developed with the World Bank technical assistance. The database of addresses of all households in Armenia was divided into 48

strata including 12 communities of Yerevan city. The households from other regions (*marzes*) were grouped according to the following three categories: big towns with 15,000 and more population; villages, and other towns. Big towns formed 16 strata (the only exception is the Vayots Dzor *marz* where there are no big towns). The villages and other towns formed 10 strata each .

According to this division, a random, two-step sample stratified at *marz* level was developed. All *marzes*, as well as all urban and rural settlements were included in the sample population according to the share of population residing in those settlements as percent to the total population in the country. In the first step, the settlements i.e., primary sample units, were selected: 43 towns out of 48 or 90 percent of all towns in Armenia were surveyed during the year; also 216 villages out of 951 or 23 percent of all villages in the country were covered by the survey. In the second step, the respondent households were selected: 6,816 households (5,088 from urban and 1,728 from rural settlements).

As a result, for the first time since 1996 survey data were representative at the *marz* level.

(ii) Comparability of survey data over 1998/99-2004

The 2004 ILCS data can only be compared with the results of the 1998/1999 ILSC (implemented in the period from July 1, 1998 till June 30, 1999). This could be explained primarily by the sampling frame of those two surveys.

Table 1: Number of households surveyed and number of urban and rural settlements covered by the sample, 1996-2004

	1996	1998/99	2001	2002	2003	2004
Number of households surveyed	4920	3600	4037	4634	4641	6816
Number of urban settlements covered by the sample	28	33	19	14	17	43
Number of rural settlemenst coverd by the sample	100	71	28	30	20	216

Source: NSSA.

The 2004 survey covered 43 urban and 216 rural areas with the sample size of 6,816 households, and as mentioned earlier, it gives a unique opportunity to obtain data representative at the *marz* level. Similarly, the 1996 survey had a big coverage of settlements and a large sample size; however the survey was conducted during one month only (from November 15- December 15) rendering it incompatible with the 2004 ILSC that was implemented over one year. The sample sizes for 2001-2003 surveys were big enough, but they covered very few rural settlements, because of insufficient funds allocated for these surveys in the state budget. The 1998/99 survey covered 33 urban and 71 rural areas and is the best basis for comparisons, though the sample design methodology and selection methods differ from the ones used for the 2004 ILSC. In 1998/1999, the sample frame was designed according to the list of addresses of households received from the administrative units at the beginning of 1996, while in 2004 the sample frame was designed according to the 2001 population census database. The sample of the 1998/1999 survey was self-weighted, while the sample of 2004 ILCS is stratified according to the share of each PSU in the total population.

(iii) Description of the field work

In 2004, a team of 71 interviewers, 6 quality control specialist and 13 supervisors conducted the fieldwork. The total survey activities were monitored by the project

coordinators. Intensive three-day training sessions were arranged for the field teams prior to the survey.

Each interviewer was working in 12 clusters during a year, visiting 8 households every month. Once the interviewer finished the work in a given cluster he/she presented the completed questionnaires and diaries for data control and coding together with a report on sample results. Each interviewed household received AMD 550 for keeping a diary during the month of the survey. The field work was under thorough supervision and numerous control interviews were conducted. The collected questionnaires and diaries were coded, logically tested and the information was entered using the special software for data entry, double entry and verification of entered data. As a result, a database containing information on 6,816 households was formed. During the field work the interviewers visited 11,885 addresses. The average national refusal rate was 10.4 percent (Table 2 presents refusal rates by *marzes*).

Table 2: Households covered by the sample and refusal rates by *marzes*, 2004

Marzes	Number of questionnaires filled	Refusal rate
Yerevan	2016	17.9
Aragatsotn	384	12.6
Ararat	576	9.1
Armavir	576	5.8
Gegharkounik	480	7.0
Lori	576	8.9
Kotayk	576	6.4
Shirak	576	9.9
Syuinik	384	3.2
Vayots Dzor	288	1.1
Tavoush	384	0.2
Total	6816	10.4

Note: Refusal rate is defined as the number of refusals divided by the total number of addresses used.

The refusal rates, defined as the number of refusals divided by the total number of addresses used, differ significantly by *marzes*. The highest refusal rate was in Yerevan (17.9 percent) and the lowest in Tavoush (0.2 percent).

(iv) Survey tools

To conduct the 2004 ILCS the NSSA survey team with assistance from the World Bank developed the following survey tools: a questionnaire, a diary and the interviewers' manual.

The questionnaire is completed by an interviewer during his/her minimum of five visits to a surveyed household within a month. During the face to face interviews with the head of the household or another adult member, the interviewer collected information on the composition and housing conditions of the household, level of education and health status of household members, their employment status, land ownership, availability and utilization of cattle and agricultural equipment, and other information. The sections included in the questionnaire are as follows: (1) Household Roster; (2) Migration; (3) Housing Conditions; (4) Occupation; (5) Education; (6) Agriculture; (7) Self Employment; (8) Transfers Between Households; (9) Health; (10) Savings and Loans; (11) Self Assessment of Well-Being; (12) Social Capital and Provision of Services; and (13) Social Assistance.

The diary is completed by the household within a month. Every day the households recorded all their expenses on food, non-food products and services with detailed description of what they bought, such as the name of the product, its quantity, cost and the place of purchase. In addition, the households recorded the consumption of products, which were bought and/or received and utilized from their own farms, as well as products which were received from other households. At the end of the month, the information on rarely used food products, durable goods and ritual (funeral, wedding and etc.) services was recorded as well. The records in the dairy were verified by the interviewer during his/her visits to the household within the same month. The detailed list of the sections in the diary is presented below: (1) Purchased food products during the day; (2) Food consumed at home during the day; (3) Food consumed outside; (4) Non food products purchased and services received; (5) All other non food products and services received free of charge; (6) Household income and revenues; (7) Food that is usually consumed daily in small quantities; and (8) List of real estate, durable goods and ritual services.

The Interviewers' Manual provides detailed instructions for filling out the questionnaire and the diary. Both the questionnaire and the diary were revised according to the results of a pre-test conducted in January 2004 prior to launch of the survey as of April 1, 2004.

2. Welfare measure: consumption aggregate calculation

A consumption aggregate is used to approximate well-being in Armenia. It is assumed that consumption is better declared and is less sensitive to short-term fluctuations than income, especially in transition countries. The consumption aggregate is estimated based on the Armenia Integrated Living Conditions Survey (ILCS). It comprises the following components: (i) the value of food and non-food consumption including consumption from home production, as well as aid received from humanitarian organizations and other sources; and (ii) the rental value of durable goods.

(i) Food consumption:

Food consumption includes food consumed at home and outside the home (i.e. in restaurants etc.) and in-kind food consumption such as own food home production, food gifts and transfers in-kind, and humanitarian food aid.

The Armenian ILCS provides information on household purchases of 195 food items and information on household food consumption over the 30 days of the Survey. In order to express food consumption in monetary values, the estimated prices of purchased items are used. The collected information on household food purchases includes the value, quantity, unit of measure and the location of purchase. Using the value and (standardized) quantities, unit values for all items at the household level were estimated. Based on the household-level unit values, median unit values were estimated at different levels of aggregation. Three basic categories were used for disaggregation: a region (*marz*), location (urban/rural), and a quarter of the interview. The median prices were estimated excluding household-level prices that were identified as outliers. An outlier is detected if a distance between the household-level price and the "local" price is larger than two standard deviations. The local price is defined as the median price at the corresponding *marz*-urban/rural-quarter strata.

If the household purchased the item, the reported price was used. If the household consumed an item, but did not purchase it, the *marz*-urban/rural-quarter price was imputed. Note that those prices are not affected by outliers. Five items were reported in the Food Consumption Module but not reported in the Food Expenditures Module. For

those items the price for the corresponding month/quarter from the NSSA price department was imputed.

(ii) Non-food consumption

Non-food consumption comprises the following categories: alcoholic beverages and tobacco, clothing and footwear, household goods, transportation, utilities, recreation, education, health, and the rental value of durable goods. It also includes in-kind non-food consumption such as non-food goods and services received free of charge (i.e., in-kind non-food humanitarian aid, gifts, non-food goods and services provided by the members of the household). Value of in-kind non-food consumption is estimated by households. Using monthly expenditure data, monetary values for expenditures on non-food items were estimated. Price adjustments for those groups were based on the official CPI for the corresponding quarter.

The rental value of dwelling—benefits for owner-occupied housing—is not estimated as a component of consumption due to the lack of data on housing transactions in Armenia.

The estimates of the rental value of durables—the value of flow of services from durables owned by a household—faced some difficulties, although the 2004 ILCS contains more detailed information on durables than surveys in previous years. The questionnaire (diary) indicates whether a durable good is bought during the last 12 months and the price paid for it. It includes additional information on durables such as the age of durables owned by the household and the estimated current value of durables if sold. However, the respondents over-estimated the current value of durables if sold, giving in some cases even higher value than the value of new durables[1]. Given the above problems with the data, a simple technique is used to estimate the durables rental value. Using an annual depreciation rate, the rental value of the items bought during the last 12 months is estimated[2]. The rental value of second-hand items bought during the last 12 months is estimated as one third of the rental value for the new items. For those items that were bought more then one year ago (and apparently were much older), the rental value is assumed as one fifth of the median rental value for each item. This technique is compatible with alternative approaches where the rental value is estimated as the ratio between the value of the good (when reported) and the expected remaining life of the good (World Bank, 2000)[3]. In this case, the underlying assumption is that items not reported by households as bought during the last 12 months prior to the Survey, have an average life of 20 years.

(iii) Adjustments for regional and seasonal differences in prices

As the survey data were collected throughout the year, there is a need to adjust consumption from different quarters for inflation. Furthermore, regional price differences can distort the measure of well-being, as consumption is a good measure of well-being only if higher expenditures mean higher consumption or consumption of better quality goods; this is not the case when higher levels of consumption are caused by higher prices. Therefore, those regional price differences ought to be corrected for.

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[1] Based on these observations, the 2006 ILCS questionnaire (diary) will be improved so as to include additional information on purchased value of durables owned by household.
[2] A depreciation rate of 8 percent implies that in ten years the good will have lost 57 percent of its value. In the United States, the depreciation rate is 6.66 percent (Office of Management and Budget, 1999). The Armenia Poverty Update uses the rate of 8 percent, as a way to account for a higher inflation rate.
[3] See: **Panama Poverty Assessment, Priorities and Strategies for Poverty Reduction**, The World Bank. Washington, D.C., 2000.

Food consumption is adjusted for price differences over time and across regions using the survey data, since the NSSA does not provide urban and rural food prices. The non-food consumption is adjusted only for price changes over time as only the official Consumer Price Index (CPI) can be used for this purpose, given the fact that unit values for non-food items are normally not collected by household surveys.

Factors for price adjustments of food consumption which takes into account price differences between quarters and between urban and rural areas were estimated using three different types of price indices: Laspeyres, Paasche and Fischer index. Table 4 shows price differences by quarters and by urban and rural regions using these price indices. The Fischer index is used for price adjustments, as its value lies between the Laspeyres (upper value) and the Paasche values (lower value). This is expected given the way of its calculation (Laspayers index multiplied by Paasche index). Food consumption for 2004 is expressed in 2004 autumn-urban price levels.

Table 3: Factors for price adjustment of food consumption, median prices (multiplied by 100)

Quarter	Urban			Rural		
	Laspeyres	Paasche	Fischer	Laspeyres	Paasche	Fischer
April-June, 2004	101.3	98.2	99.7	100.8	100.5	100.6
July-September, 2004	100.8	100.1	100.5	101.5	99.3	100.4
October – December, 2004	**100.0**	**100.0**	**100.0**	96.6	98.1	97.4
January-March, 2005	91.3	86.7	89.0	86.6	86.2	86.4
Implicit inflation, II 2004/IV 2004	+1.3%	-1.8%	-0.3%	+4.3%	+2.4%	+3.3%

Source: ILCS 2004.
Note: Factors convert food expenditures into amounts comparable with urban areas during the last quarter in 2004. Food consumption values from different households are multiplied by those factors for the corresponding poverty analysis. The Fischer index is used (median prices).

Food prices in rural areas increased more than in urban areas. The Fischer index shows that food prices in urban areas remained stable in the last quarter of 2004 compared to the second quarter of 2004, while in rural areas prices increased by 3.3 percent. According to official CPI estimates based on Laspeyres index, which includes only prices in big cities in Armenia, food prices declined by 5.8 percent over the same period. Significant variations in food prices over the 12-month survey period appeared in the first quarter of 2005 (the last quarter of the 2004 ILSC). Food prices were significantly higher in the first quarter of 2005 regardless of the index used. The Fischer index shows that food prices in urban areas in January-March 2005 were 12.4 percent higher than in the fall, and therefore they should be multiplied by 0.89 so as to be expressed in fall urban price levels. Official CPI also shows big increase in food prices over the same period observed (11.8 percent; I quarter 2005/IV 2004).

Non-food consumption is adjusted for inflation using the official CPI for relevant non-food expenditure sub-groups provided by the National Statistical Service. The total consumption aggregate is then expressed in 2004 autumn price levels.

Table 4: Composition of the consumption aggregate, 2004

Consumption aggregate			Components
C_0	=		Food
C_1	= C_0	+	Alcohol and tobacco; clothing and shoes
C_2	= C_1	+	Household goods
C_3	= C_2	+	Utilities, transportation
C_4	= C_3	+	Education, culture, recreation
C_5	= C_4	+	Health
C_6	= C_5	+	Rental value of durables

Finally, household consumption is calculated as the sum of the above sub-aggregates (Table 5), with food consumption adjusted for regional and quarterly variations in prices and non-food components adjusted for quarterly variations in prices. Different consumption aggregate definitions were used in the estimates of different equivalence scales and size economies parameters, in order to examine the sensitivity of those estimates.

3. Equivalence scales and household size economies

Equivalence scale takes into account differences in consumption between adults and children. It is believed that consumption needs of young children are less than those of working-age adults. Furthermore, household size economies take into account that some of household expenditures are shared between household members (i.e., expenditures on housing, utilities, car, newspapers, etc.). For example, a five member household with US $100 per month is better off than a single person who lives on US$20 per month because of economies of scale in consumption.

(i) Equivalence scales

The Engel method is used to estimate equivalence scales of children as compared to adults. This method estimates the cost of children as the compensation necessary to bring the household well being—measured by the *share of food consumption*—back to its original level (without children).

The standard Engel equation is a regression that explains the share of food expenditures, w_f, presented in the following form:

$$w_f = \alpha + \beta \ln\left(\frac{x}{n}\right) + \sum_{j=1}^{J} \gamma_j n_j + \varepsilon \qquad (1)$$

where n_j is the number of individuals in the jth demographic category ($j=1,\ldots,J$), n is the number of people in the household, x is the total expenditure, ε is a random error, and α, β, and γ are parameters. Sometimes a quadratic term on $\ln(x/n)$ is included. Based on the regression (1) and under different specifications of the consumption aggregate, the equivalence scales were estimated. For a household composed of an adult couple, the equivalence scale parameter represents the ratio between the budget with an additional child and the original budget in order to keep the food share constant. These estimates are presented in the next table.

Table 5: Equivalence scales for children aged 0-14

Consumption aggregate	Equivalence scale E	Test E=1; F-test
1	1.737	1206.4
2	1.704	1501.4
3	1.631	1524.9
4	1.643	1930.3
5	1.645	2462.8
6	1.549	1345.2

Note: The equivalence scale E denotes the ratio of the household expenditures after the inclusion of an additional child, x_1, to the household expenditures before the change, x_0. That is, E = x_1/x_0. This is interpreted as required percentage increase in expenditures to keep the household welfare unchanged.

The results indicate that an additional child would represent between 74 and 55 percent of the cost of an adult depending on the consumption aggregate used. Once utilities were included (consumption aggregate 3), the cost of a child declined from 71 percent of an adult to 63 percent. It slightly increased to 64 percent when education is included (consumption aggregate 4) and remained stable when health expenditures were included. It was assumed that an additional child will have a cost of 64.5 percent of an adult (consumption aggregate 5), which is very close to estimates obtained using consumption aggregates 3 and 4 and very close to previous estimates based on 1998/99 survey data[4].

(ii) Household size economies

Following Lanjouw and Ravallion (1995) the size economies were estimated using a food share equation where, controlling for differences in household composition and other variables, an estimate of size economies can be done. The parameter θ represents the degree of scale economies in household consumption. If $\theta=1$, no economies of scale are present and the use of *per capita* consumption is appropriate. The food share can be written as a function of per-equivalent consumption, x/n^θ, household demographic composition variables ($\eta_j = n_j/n$), prices, and other variables such as location. The estimating equation can be written as

$$w_f = \alpha + \beta \ln\left(\frac{x}{n^\theta}\right) + \sum_{j=1}^{J-1} \gamma_j \eta_j + \varepsilon = \alpha + \beta \ln x + \beta\theta \ln n + \sum_{j=1}^{J-1} \gamma_j \eta_j + \varepsilon \qquad (2)$$

and an estimate of θ can be obtained from the ratio of the coefficients of consumption and a household size.

Table 6: Household size economies

Consumption aggregate	OLS Mean (1)
1	0.710
2	0.756
3	0.790
4	0.743
5	0.710
6	0.874

Equation (2) was estimated using OLS regression. Table 6 shows the estimates of θ for different definitions of the consumption aggregate. The finding that relatively big size economies are in food and clothing consumption must be taken with the following caveat. The parameter estimates for θ using the consumption aggregates 1 through 3 may be biased since a fraction of households have food shares equal to 1. Size economies in food consumption, however, are not new to the literature (Deaton and Paxson, 1998). The full consumption aggregate shows that size economies are observed and are close to 0.87. It is assumed that a size elasticity around 0.87 may be appropriate for Armenian households, and is used in this Report.

(iii)Estimating consumption per adult-equivalent

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[4] Estimates of equivalent scales using the 1998/99 survey data accounted for 0.68.

Consumption per adult-equivalent is obtained dividing household total consumption by the number of *adult equivalent members* (EA_i). Adult equivalent members are calculated using the above estimates of equivalence scales and size economies according to the following formula for household i:

$$EA_i = (A_i + a\ C_i)^{\theta}$$

where A_i is the number of adults in the household, C_i is the number of children, θ is the scale parameter (θ=0.87) and a is the cost of a child relative to an adult (a=0.65). Children are individuals of age 14 and below.

Those estimated parameters will be used to express household consumption in a per adult equivalent measure over the next years, hence avoiding changes in poverty indicators due to changes in those parameters.

4. Poverty lines

(i) Food poverty line

The food poverty line is used to determine the very poor population, or as it is often expressed, people who live in extreme poverty. This line is defined as an amount of consumption necessary to satisfy basic food needs. Hence, people whose consumption falls short of satisfying basic food needs are considered to be very poor. To express this amount in monetary terms, a national average caloric requirement needs to be determined and the cost of one calorie estimated.

Average caloric requirement: The average caloric requirement for Armenia is calculated using information on caloric requirements of different demographic groups according to the World Health Organization (1985) standards and information on population shares of these demographic groups (Table 7). In that way, the average caloric requirement for Armenia is estimated at 2,232 calories per day per capita.

Table 7: Daily per capita caloric requirements for Armenia, 2004

	Men 16-60	Female 16-60	Elderly	Children 0-6	Children 7-15	Average caloric requirement
Daily caloric requirements						
	2,655	*2,099*	*2,006*	*1,614*	*2,362*	
Demographic composition						
Yerevan	0.279	0.360	0.151	0.078	0.131	2,237
Aragatsotn	0.257	0.305	0.151	0.115	0.172	2,217
Ararat	0.260	0.317	0.150	0.083	0.190	2,239
Armavir	0.264	0.322	0.135	0.098	0.181	2,234
Gegharkounih	0.257	0.321	0.157	0.091	0.174	2,229
Lori	0.236	0.316	0.175	0.092	0.181	2,216
Kotayk	0.283	0.352	0.122	0.077	0.166	2,251
Shirak	0.251	0.323	0.149	0.100	0.177	2,223
Syunik	0.259	0.321	0.166	0.084	0.169	2,231
Vayots Dzor	0.258	0.308	0.163	0.091	0.181	2,231
Tavoush	0.249	0.309	0.205	0.082	0.155	2,220
All Armenia	0.264	0.334	0.153	0.087	0.162	***2,232***

Source: ILCS 2004 and WHO (1985).

Cost of one calorie: The cost of one calorie for Armenia is calculated by dividing total country expenditures on food with total country caloric consumption. Total country expenditures on food are obtained by summing household expenditures on food for all households in the sample. Using the information on the value of every food item purchased for each household (including imputed consumption in kind, i.e. food consumption that is not purchased, received as gifts, and humanitarian aid), household expenditures on all food items are calculated. Total country caloric consumption is computed by summing household caloric content for all food items and for all households. Caloric content of each food item is obtained from the Food and Agriculture Organization (FAO). Total caloric content of each food item purchased and/or consumed is calculated using the information on quantity purchased and/or consumed and caloric content of the food item per kilo.

The food poverty line is obtained by multiplying country-average caloric requirement with the cost of one calorie. The cost of one calorie is estimated at AMD 173.7 per person per month using mean prices and AMD 167.2 per person per month using median prices (both estimated based on the 2004 ILSC). Thus, the cost of a 2,232 calorie basket per month is set at AMD 11,631[5] per capita using mean prices and AMD 11,195.7[6] per capita using median prices. The value of the food poverty line is expressed in urban prices from the fourth quarter of 2004, as the consumption aggregate is expressed in these prices (2004 autumn urban price levels). The food poverty line estimated in this way reflects the actual consumption patterns of the average Armenian households and the prices they face in reality when shopping for food.

The per capita food poverty line is then adjusted for equivalence scales, as welfare measure—consumption—is expressed per adult equivalent. The estimated ratio of the weighted average of equivalent scale coefficients for different demographic groups (adults and children) and household size of 0.898 is used to express the food poverty line per capita in food poverty line per adult equivalent. Accordingly, the average food poverty line per adult equivalent in 2004 is estimated at AMD 12,952 using mean prices and AMD 12,467 using median prices.

(ii) Complete poverty line

The complete poverty line comprises the food poverty line and a **non-food** allowance, as individuals should be able to cover not only basic food needs, but also essential or minimum non-food needs. The non-food allowance for the complete poverty line is estimated using the Food Expenditure Method (FEM) and Consumption Basket Method (CBM), (see World Bank, 2002). According to the first method, the non-food share is estimated as a non-food share of those households whose food consumption per adult equivalent is around the food line. According to the second approach (CBM), the non-food share is estimated as the non-food share of those households whose total consumption per adult equivalent is around the food line. The results are presented in Table 8 using different relative distance to the food line and the mean and median prices.

The estimates of the non-food share are slightly higher using the first than using the second approach, as expected. Using the Food Expenditure Method, the share of non-food consumption is estimated at 43.4 percent of the total minimum consumption (+/- 2% distance to food line), while using the Consumption Basket Method it is estimated at 35.6 percent.

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[5] It is obtained as: 173.7*30 days*2.232 kilo calories.
[6] It is obtained as: 167.2*30 days*2.232 kilo calories.

The complete poverty line is calculated using the estimated non-food share based on the two methods described above and applying the relative distance to the food line of 2 percent. According to the above estimates, the complete poverty line for Armenia is set between AMD 18,984 and AMD 24,429 per adult equivalent per month using mean prices, and between AMD 19,373 and AMD 20,033 per adult equivalent per month using median prices. In this report, the food poverty line of AMD 12,467 per adult equivalent per month and the complete poverty line of AMD 19,373 per adult equivalent per month are used.

Table 8: Armenia: Poverty lines, 2004

Relative distance to food line	Food poverty line per adult equivalent, in drams	Non-food shares (in %)		Complete poverty line	
		Lower	Upper	Lower	Upper
Average prices per calorie					
2%	12,952	31.77	46.98	18,984	24,429
5%	12,952	29.76	46.00	18,439	23,987
10%	12,952	30.74	44.22	18,701	23,219
Median prices per calorie					
2%	**12,467**	**35.64**	43.42	**19,373**	22,033
5%	12,467	31.77	43.42	18,274	22,033
10%	12,467	30.74	45.08	18,001	22,701

Source: ILCS 2004.
Notes: Food poverty line and non-food shares are estimated in prices for the fourth quarter of 2004 in urban areas.

In order to compare poverty indicators between 1998/99 and 2004, the food and complete poverty lines for previous years were estimated. The food line over 1998/99-2003 is adjusted by the CPI for food; similarly the non-food component of the complete poverty line is adjusted by the changes of the CPI for non-food items over the observed period (Table 9) and added to the adjusted food line in order to get the nominal value of the complete line in respective years.

Table 9: Armenia: Poverty lines, 1999-2004, in drams

	1998/99	2001	2002	2003	2004
Food poverty line	11,210	10,246	10,441	11,662	12,467
Complete poverty line	17,663	16,989	17,299	18,541	19,373

Source: ILCS 1998/99-2004.

The same approach to adjusting the nominal value of the poverty lines will be used for the next several years. The 2004 food line will be adjusted for food inflation between 2004 and the year in question using the prices of food items from the survey. Similarly, the nominal value of the non-food allowance estimated on the basis of 2004 survey will be adjusted only for inflation of non-food items between 2004 and the year in question using the CPI for non-food items from the price statistics. Thus, using the fixed poverty line in real terms over the period of several years, evolution of poverty over time relative to the same benchmark can be tracked. In addition, fixing the food and non-food allowance allows monitoring poverty changes over time which are not caused by different consumption patterns.

5. Main poverty indicators

In this report, following international practice, poverty is measured by the poverty incidence, gap and severity indicators. The headcount index or poverty incidence is the simplest and most frequently used measure of poverty. It represents the fraction of

individuals with consumption per adult equivalent below the poverty line (Forster et al 1984). The poverty gap index indicates how poor the poor people are, i.e. how far their consumption is below the poverty line. The severity of poverty indicator is used to measure the inequality of consumption among the poor (some poor people may have consumption close to the poverty line, while some may be far from it).

The poverty measurement indicators are described by the following formula:

$$P(\alpha) = \frac{1}{n} \sum_{i=1}^{n} \left[\max\left(\frac{z - c_i}{z}, 0 \right) \right]^{\alpha}$$

where α is parameter (explained below), z is the poverty line, c_i is consumption of individual i, and n is the total number of individuals. For α equal to 0, P(0), or the *poverty headcount index* is obtained; it measures the fraction of individuals below the poverty line. If α is equal to 1, P(1), or the *poverty deficit index* is obtained; it indicates how far the poor, on average, are below the poverty line. P(1) can be defined in the following way:

$$P(1) = P(0) * (Average \; Deficit)$$

where the average deficit is measured as a percentage of the poverty line by which the consumption of the poor on average falls short of the poverty line. Finally, if α is equal to 2, P(2), or the *severity of poverty index* is obtained; it indicates inequality of consumption among the poor.

In this report, overall poverty trends are described using all three measures of poverty, while the analysis of the poverty profile mainly relies on the poverty headcount.