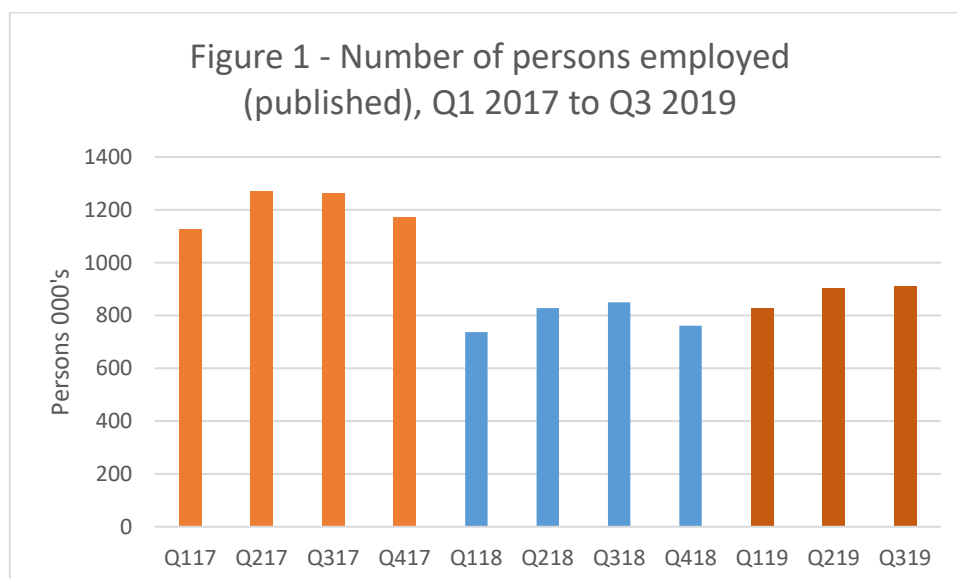


Changes to the Labour Force Survey of Moldova – overview and assessment of impact

Executive Summary:

Between 2018 and 2019 some important changes have occurred in published labour market statistics for Moldova. The changes have been made to make important updates to the methodology to reflect latest international standards and practices. The impact of these changes has been very visible, particularly in the statistics on employment and unemployment. Figure 1 shows the headline level of employment between 2017 and 2019. As can be seen between important shifts in the series both at the beginning of 2018¹ and again, although less substantial, at the beginning of 2019.



Shifts can also be seen in other labour market indicators such as those on unemployment. These movements are the result of changes in methodology that are designed to improve the quality of the statistics in various ways. The changes introduced and their impact on the statistics are explained in this note.

The key points of note include:

- The latest ILO international statistical standards have been applied in the LFS questionnaire, starting in Q1 2018 and the series applying these standards were first published with the Q1 2019 results. These standards update definitions of employment and unemployment to generate more detailed and meaningful information on labour market engagement and participation in paid and unpaid work.

¹ LFS questionnaires for 2018 allowed the calculation of "employment" according to the new definition, adopted by the 19th International Conference of Labour Statisticians in 2013.

- In this new framework, work done to produce goods for own use is not included in the definition of employment, instead it is identified as a different form of work. The result is that the estimate of employment is lower when the new standards are applied.
- By contrast estimates of unemployment increase because some of the people no longer identified as employed can now be identified as unemployed.
- A new population concept and updated population estimates have been introduced starting in Q1 2019, also with recalculations for 2018. The population concept now applied is the usual resident population, as widely used internationally, while the population estimates have also been updated to take into account the results from the 2014 Census of Population. The result of these changes is a lower estimate of the population. This has an impact on labour market estimates, generating lower estimates of employment, unemployment and all related indicators.

The recalculations done for 2018 allow a comparison of the old and new series to analyse the impact of the changes (section 2 of the report). As explained in more detail in the main report the changes in estimates are consistent with expectations given the changes in methodology made. The impact on some of the key indicators is shown in table A.

Table A - Impact of changes on estimates of number of persons employed, 2018

	2018 average			
	Old standards, stable population (Old series)	New standards, stable population	New standards, new population (new series)	Overall Change (old to new series)
	Persons 000's			%
Employment (persons)	1252.2	1028.3	794.1	-37
Unemployment (persons)	38.4	44.0	34.1	-11
	%			PP
Labour force participation rate	43.3	35.9	37.3	-6.0
Employment to population ratio	42.0	34.5	35.8	-6.2
Unemployment rate	3.0	4.1	4.1	+1.1

- The new estimate of employment for 2018 was 794,100. This was 37% lower than the old employment estimate (1,252,200). About half of this difference was accounted for by the introduction of the new standards, and the other half by the changes in population definition and estimates.
- The new standards caused a higher estimate of unemployment, but this was cancelled out by the impact of the new population definition and estimates. Overall, the new estimate of unemployment for 2018 was 34,100, which was 11% lower than the old estimate (38,400).
- The labour force participation was 6 percentage points lower under the new series (37.3% versus 43.3%), while the employment-to-population ratio was 6.2 percentage points lower (35.8% versus 42.0%). Meanwhile the unemployment rate was 1.1 percentage points higher (4.1% versus 3.0%). The reduction in these key rates was entirely caused by the introduction of the new standards.

An additional methodological change was introduced in Q1 2019, when the sample frame and sampling methodology were updated (section 3 of the report). It is not possible to generate a direct estimate of the impact of this change on estimates. Therefore, there is a break in the series between Q4 2018 and Q1 2019 that should be taken into account when analysing time series. The direction of the break is known, namely an upward break (higher level of estimates) for both employment and unemployment. This can be explained by the fact that some newer housing areas are now included in the sample, which have relatively higher levels of labour market engagement.

The changes introduced improve the quality of the statistics generated and have been implemented to apply updated good practices and international standards.

An additional benefit of the introduction of the new ILO international statistical standards is that it allows additional indicators to be generated to support more detailed analysis and understanding of labour market engagement and work (section 4 of the report).

The changes and their impacts are discussed in more detail in the main body of the report.

This report was prepared in collaboration between the ILO Department of Statistics (Kieran Walsh and Desiree Manamela) and the National Bureau of Statistics of Moldova.

1. Introduction:

Changes in statistical methodology and definitions occur across all statistical domains. The general purpose of changes will typically be to improve the quality² of the statistics generated in, for example their relevance, coherence, clarity and comparability. The nature of changes will also be varied, sometimes coming from the introduction of new statistical frameworks at the international level, introduction or update of national data sources or various methods such as sampling approaches etc.

In the case of labour statistics, the National Labour Force Survey (NLFS) of Moldova and the statistics generated from it have been subject to different changes since the beginning 2018. The purpose of these changes is to make best use of the most up to date information available, particularly from the 2014 Census of Population, and to incorporate the latest international standards on labour statistics.

1.1 Changes introduced to NLFS:

Three important changes have been made to the methodology of the labour force survey that have impacted the results generated in 2018 and 2019.

1. **Introduction of updated statistical standards adopted at the 19th International Conference of Labour Statisticians (ICLS):** In 2013 the international community agreed standards which provide updated definitions for key statistics on employment, unemployment and related statistics on labour. In the first quarter of 2018 changes were made to the LFS questionnaire of Moldova to apply the latest standards.
2. **Population estimate revisions and change in the reference population concept:** Estimates of the population are used to weight the results from the LFS. In 2019 the population definition used changed to come into line with typical international practices. At the same time the population estimates being used were updated to take into account information from the 2014 Census of Population.
3. **Change in sampling design and frame:** Using information from the 2014 Census of Population the sample of households interviewed for the NLFS has been updated to ensure it is up to date and representative. The sampling methodology has also been updated. These changes were introduced in the first quarter of 2019.

Each of these changes has had an impact on the results generated from the NLFS. The methodological changes are explained in more detail in the annex to this note. For the remainder of the note we will focus on illustrating the impact of the changes on published statistics.

The National Bureau of Statistics (NBS) continued to publish labour market statistics applying the old standards and population estimates up to Q4 2018. In Q1 2019 the new series with all the methodological changes included were published. In addition, recalculations were made for 2017-2018, taking into account the new definition of the population³. Section 2 of this note is based on a comparison of the old and new series using the 2018 data. This type of comparative approach has been used in many countries to estimate the impact of changes in statistical series.

For the change in sampling design and frame no direct estimation of the impact is possible as there was no period where both the old and new sample were in use simultaneously. Nonetheless, the

² Statistical quality is a function of a range of issues. See the UN National Quality Assurance Frameworks Manual pages 7 to 8 for a brief description: <https://unstats.un.org/unsd/methodology/dataquality/references/1902216-UNNQAManual-WEB.pdf>

³ The results of the AFM will be recalculated taking into account the new definition of the population for the years 2014-2018.

expected impact is discussed in general terms later in the report (see section 3). Section 4 outlines the additional analysis enabled when the new standards are applied.

2. Impacts of the changes – introduction of new standards and change in population definition and estimates

In the section we attempt to explain the impact of the different changes on key indicators. While all indicators derived from the LFS are impacted by the changes, in the interests of clarity, the main focus of this note is on estimates of employment and unemployment. We will start the analysis by looking just at the impact of the introduction of the new statistical standards agreed at the 19th ICLS. The impact of the population definitions and estimates, and the overall difference between the old and new series is discussed in section 2.2.

2.1 Impact of the introduction of the 19th ICLS standards

2.1.1 Impact of the new standards on employment estimates

In the case of the introduction of the 19th ICLS standards the reduction in the employment estimate is the expected outcome. As explained in more detail in the annex, one of the major changes introduced with the new standards is to create a narrower definition of employment, along with additional forms of work for separate measurement. Specifically, some unpaid activities, such as work done to produce foodstuff for family consumption, used to be included in employment. Under the new standards they are considered “own-use production work” and not part of employment. This kind of activity, in particular farming to grow food for the family, is common in Moldova, and it was included in the employment estimate published under the old standards if the people worked more than 20 hours.

The change in the standards was introduced as a reaction to demands for data that more clearly shows the different types of work people engage in, and to apply a definition of employment more closely linked to employment policy interests.

Number of persons employed

The easiest way to illustrate the impact of the change is to show how the series would have been if the introduction of the new standards was the only change made. This is illustrated in figure 3 and table 2 which show the data for 2018.

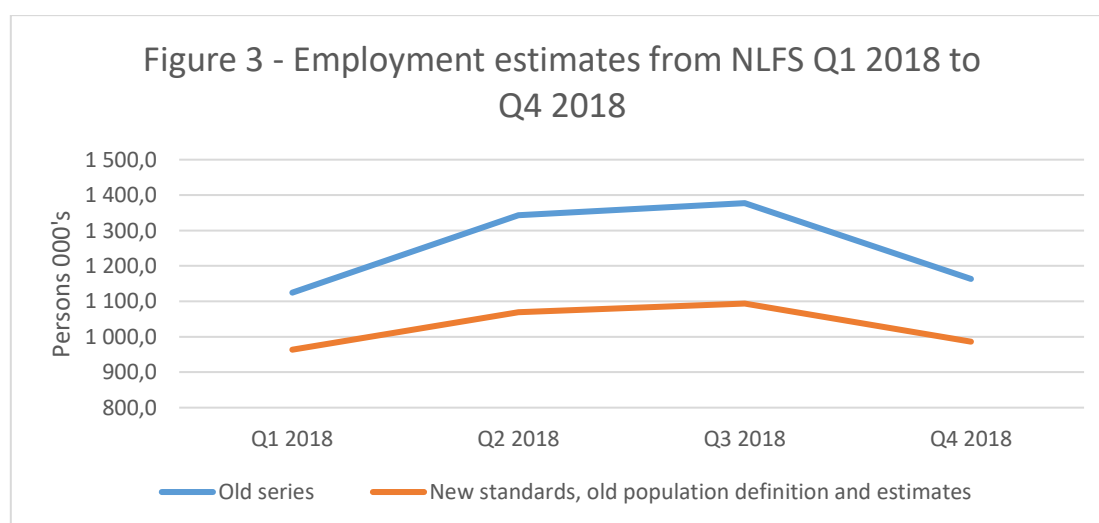


Table 2 – Employment: impact of introduction of new standards – Q1 2018 to Q4 2018

	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Annual Average 2018
	000's				
Old standards, stable population	1,124.6	1,343.4	1,377.3	1,163.6	1,252.2
New standards, stable population	963.6	1,069.6	1,093.9	986.0	1,028.3
Difference due to new standards (%)	-14	-20	-21	-15	-18

As can be seen the level of employment recorded using the new standards was on average 18% lower in 2018 than the old series. This difference precisely relates to people who were doing farming to produce foodstuff for family consumption, and are no longer included in employment. Another way of putting this is that 18% of those who were employed under the old standards were doing farming work to produce foodstuff for family consumption for more than 20 hours in the reference week, with no other job.

The level of impact was different across the quarters of the year due to the seasonal nature of agricultural work. Quarter 1 and Quarter 4 are the periods when there is least agricultural work meaning the difference was relatively lower (14% or 15% respectively). During the peak agricultural period (Quarter 2 and Quarter 3) the difference was 20% or more.

We can repeat this analysis for different subgroups of the population to show where the impact is greatest. Essentially this shows that the impact is largest among groups who are more typically doing farming work. Table 3 shows the comparison for a selection of subgroups based on the 2018 average. Firstly, when we look at the sectors of activity we see that as expected the entire difference is shown in the *Agriculture, forestry and fishing* sector. Under the old standards the average employment level in this sector for 2018 was 452,000, under the new standards it is approximately half (228,100). Other points to note include:

- The impact was the same for males and females (18% reduction each).
- By age group in volume terms the greatest impact was in the 25 to 54-year age group (-114,000), which covers the majority of all employed. However, proportionally the greatest impact was in the older age groups where a larger proportion were doing agricultural work to produce foodstuff for the family, previously counted as employment.
- Unsurprisingly almost all of the impact is seen in the employment estimate for rural areas, which reduced by 210,900 or 29%, with only a minor reduction in urban areas (-2%).
- Also, unsurprisingly across the 4 zones of Moldova the greatest reduction was in the Centre where agriculture is most prevalent with the employment estimate under the new standards being 34% lower than under the old standards. By contrast the employment estimate in Chisinau was more or less unchanged by the new standards as agricultural work is relatively uncommon.

Table 3: Impact of introduction of the new standards on Employment estimates by population subgroup, 2018

	2018 average			
	Old standards, stable population	New Standards, stable population	Difference (000's)	Difference (%)
	Number of Persons 000's			%
Total	1252.2	1028.3	-224.0	-18
Industry/Sector				
Agriculture, forestry, fishing	452.0	228.1	-224.0	-50
Other sectors	800.2	800.2	0.0	0
Sex				
Males	621.9	509.6	-112.3	-18
Females	630.3	518.7	-111.7	-18
Age				
15-24 years	85.1	70.6	-14.6	-17
25-54 years	879.6	765.6	-114.0	-13
55-64 years	221.3	167.5	-53.8	-24
65+	66.3	24.6	-41.7	-63
Urban/Rural				
Urban	536.0	522.8	-13.1	-2
Rural	716.3	505.4	-210.9	-29
Zone				
North	371.2	311.2	-60.1	-16
Centre	359.3	236.2	-123.1	-34
South	202.5	165.8	-36.7	-18
Municipality Chisinau	319.2	315.1	-4.1	-1

Employment to population ratio

Another important indicator to highlight is the employment-to-population ratio. The change in the employment to population ratio is consistent with the changes to the number of persons employed, because in this case the overall population involved is the same. Table 4 shows the change in the employment population ratio for different subgroups on average for 2018. Overall, the employment to population ratio was 9.7 percentage points lower under the new standards. By age group the greatest reductions were in the 55 to 64 and 65+ age groups, rural areas and the Centre zone.

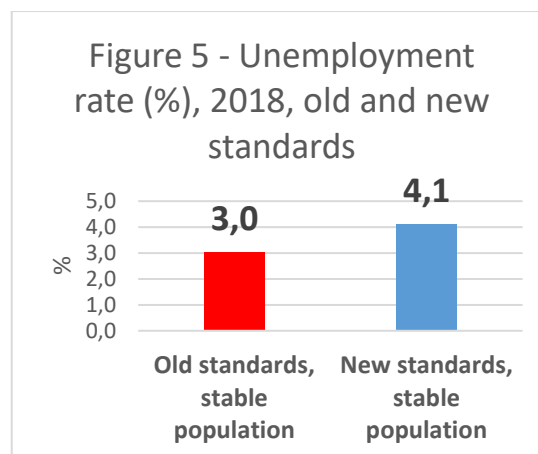
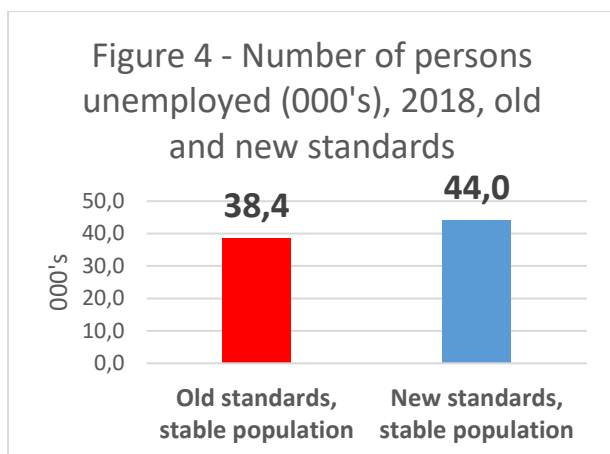
Table 4: Impact of introduction of the new standards on Employment to Population Ratio by population subgroup, 2018

	2018 average		
	Old standards, stable population	New Standards, stable population	Difference (pp)
	Employment to Population Ratio %		PP
Total	42.0	34.5	-7.5
Sex			
Males	44.2	36.2	-8.0
Females	40.0	32.9	-7.1
Age			
15-24 years	19.3	16.0	-3.3
25-54 years	53.1	46.3	-6.9
55-64 years	46.6	35.3	-11.3
65+	16.1	6.0	-10.1
Urban/Rural			
Urban	40.9	39.9	-1.0
Rural	42.8	30.2	-12.6
Zone			
North	42.9	35.9	-6.9
Centre	42.3	27.8	-14.5
South	35.1	28.7	-6.3
Municipality Chisinau	46.3	45.7	-0.6

2.1.2 Impact of the new standards on unemployment estimates

When the new standards are introduced the expectation would be that estimates of unemployment and the unemployment rate would be higher. The reason for this is that some of the people who are no longer included in the employment estimate are almost certain to be seeking and available for work. Highlighting this group was one of the motivations for the changes in the standards, to show situations where people are doing some work to produce food for family consumption but also looking and available for paid work. Under the old standards this situation was not reflected in unemployment statistics.

In addition, when considering the unemployment rate, we also expect it to be higher because unemployment rate is calculated by dividing the number of people unemployed by the labour force (multiplied by 100). As well as having a higher number of people employed, the labour force (employed + unemployed) is smaller under the new standards because of the lower level of employment. This means the numerator (unemployment) is higher and the denominator (labour force) is lower, causing the unemployment rate to be higher. The results in Moldova follow these expectations as shown in figures 4 and 5.



The number of persons unemployed under the new standards was 44,000 on average in 2018, 5,600 (15%) higher than the number under the old standards. Meanwhile, the unemployment rate recorded (figure 5) was 1.1 percentage points higher (4.1% versus 3.0%).

Table 5 shows how the unemployment rate was impacted across different population groups. For example, the impact was relatively greater on the male unemployment rate, than the female unemployment rate. As with the employment estimates the impact on the unemployment rate was very low in urban areas and in the Chisinau Municipality.

Table 5: Impact of introduction of the new standards on the unemployment rate by population subgroup, 2018

	2018 average		Difference (pp)
	Old standards, stable population	New Standards, stable population	
	Unemployment rate (%)		PP
Total	3.0	4.1	1.1
Sex			
Males	3.5	5.1	1.5
Females	2.5	3.2	0.7
Age			
15-24 years	7.4	9.9	2.4
25-54 years	3.0	4.0	0.9
55-64 years	1.9	2.7	0.8
65+	*	*	*
Urban/Rural			
Urban	4.5	4.6	0.1
Rural	1.9	3.6	1.7
Zone			
North	3.3	4.4	1.1
Centre	1.6	3.5	1.9
South	2.2	3.2	1.0
Municipality Chisinau	4.8	4.9	0.1

* Too few observations to provide an estimate

2.2 Impact of the population estimate revisions and change in the reference population concept

To understand the impact of the population estimate and concept changes on labour force indicators, we first need to understand their impact on the population used to weight the LFS. These are described in more detail in the annex. Broadly speaking the important changes to note were:

- The overall size of the population is now lower (26%) as people who are not usually resident are no longer included in the population estimate. As the population is lower than all labour force estimates of numbers of persons in different statuses (e.g. number of persons employed or unemployed) are also expected to be lower.
- The distribution of the population is different as the impact was higher in some groups than others. For example, the largest impact was seen in urban areas (-33%) and younger age groups. Because different population subgroups have different levels of labour market participation this change in distribution has an impact on key rates such as the employment-to-population ratio and unemployment rate.

As the population estimates are used to weight the results from the LFS the changes have had an impact on labour market estimates as described below.

2.2.1 Impact of the new population definition and estimates on employment estimates

To allow this comparison series have been calculated using both the old and new population estimates. The old (stable) population estimates were used for the analysis presented in section 2.1. In this section we add in the series using the new (usually resident) population estimates. We will focus only on averages for 2018.

In table 6 we can see 3 different series of data. The first 2 are those already described in section 2.1, while the third one is the new set of estimates based on all the changes. By comparing all 3 we can analyse the impact of the population change alone (the column "*Change due to population estimates*"), plus the overall change when both changes are considered (the column "*Total change (old to new estimate)*").

Number of persons employed

The population concept and estimate change caused a reduction of 234,200 (19% of the original estimate) of the number of persons employed. When combined with the introduction of the new standards the level of employment recorded for 2018 was 794,100, which was 458,200 or 37% lower than the level recorded under the old series. This means that the population definition change and new population estimates accounted for approximately half of the difference between the old and new employment estimate, with the other half being due to the introduction of the new standards.

When we look at different subgroups of the population, we see that the greatest impacts were not for the same groups as the introduction of the new standards. For example, the greatest difference in the population estimates were seen in urban areas, the Chisinau Municipality and relatively younger age groups, meaning the difference in employment estimates was also greatest for those groups (see figure 6 and table 6). Points to note include:

- In urban areas the employment estimate was 151,000 (28%) lower as a result of the new population estimates. When combined with the introduction of the new standards the new employment estimate in urban areas is 164,400 (31%) lower than the old employment estimate.

- In rural areas the reduction due to the new population estimates was 83,000 (12%), while the new standards had a larger impact. Overall, the combined difference was 293,800 or 41% of the old employment estimate in rural areas.
- Broadly speaking both the new population estimates and the introduction of the new international standards had similar impacts for men and women.
- While the new international standards had only impacted the *Agriculture, forestry and fishing* sector, the new population estimates mainly impacted other sectors. This is expected as they had the largest impact in urban areas. The estimate of employment in other sectors reduced from 800,200 to 599,900 (-25%) due to the new population estimates.

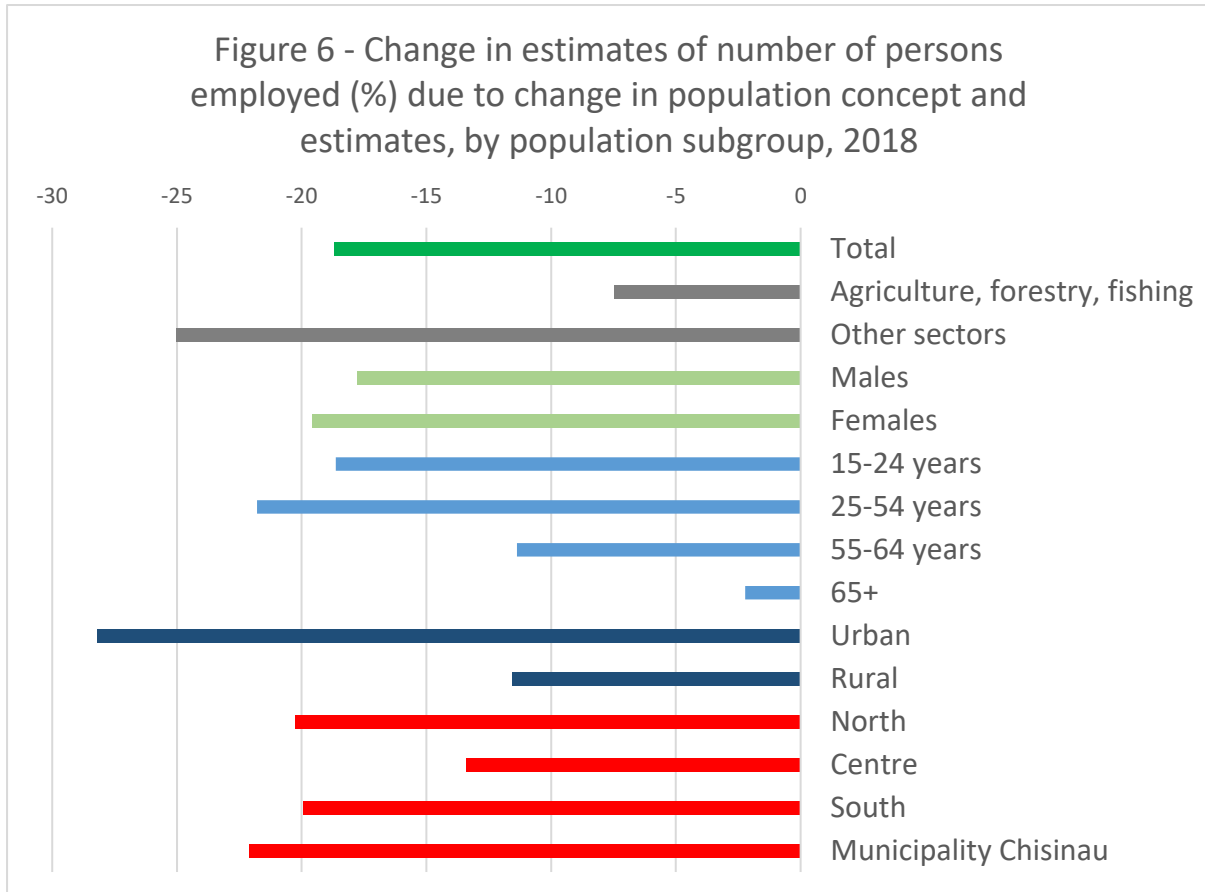


Table 6 - Impact of changes on estimates of number of persons employed, 2018

	2018 average						
	Old standards, stable population (old estimate)	New Standards, stable population	New Standards, new population (new estimate)	Change due to population estimates		Total change (old to new estimate)	
	Persons 000's			000's	% of old estimate	000's	% of old estimate
Total	1252.2	1028.3	794.1	-234.2	-19	-458.2	-37
Industry/Sector							
Agriculture, forestry, fishing	452.0	228.1	194.2	-33.9	-7	-257.9	-57
Other sectors	800.2	800.2	599.9	-200.3	-25	-200.3	-25
Sex							
Males	621.9	509.6	398.9	-110.7	-18	-223.0	-36
Females	630.3	518.7	395.1	-123.5	-20	-235.2	-37
Age							
15-24 years	85.1	70.6	54.7	-15.9	-19	-30.4	-36
25-54 years	879.6	765.6	573.9	-191.7	-22	-305.7	-35
55-64 years	221.3	167.5	142.3	-25.2	-11	-78.9	-36
65+	66.3	24.6	23.1	-1.5	-2	-43.2	-65
Urban/Rural							
Urban	536.0	522.8	371.6	-151.2	-28	-164.4	-31
Rural	716.3	505.4	422.5	-83.0	-12	-293.8	-41
Zone							
North	371.2	311.2	236.0	-75.2	-20	-135.2	-36
Centre	359.3	236.2	188.1	-48.1	-13	-171.3	-48
South	202.5	165.8	125.4	-40.4	-20	-77.0	-38
Municipality Chisinau	319.2	315.1	244.6	-70.5	-22	-74.6	-23

Employment to population ratio

The reduction in the estimated population inevitably caused a reduction in the estimates of the number of persons employed (or in other statuses). However, it is not certain that this would cause a reduction in rates or ratios, as both the numerator and denominator are reduced. This is unlike the change in the statistical standards that only impacted the numerator. If the reduction in both the numerator and denominator is in proportion (for example both reduce by 20%) then the rate, such as the employment-to-population ratio or unemployment rate would not change at all. The impact on those indicators will therefore mainly depend on how the distribution of the population changes. For example, if the new population estimates include a larger proportion of people aged 55-64 and those people have a higher than average employment-to-population ratio, this would cause the new employment to population ratio to be higher than the old one, all other things being equal.

Using the data from 2018 we can see that for all population subgroups the new population estimates created a higher employment-to-population ratio, but the level of difference is relatively small. We can interpret this as meaning that the change in distribution of the population between the old and new population estimates meant that groups with higher employment-to-population ratios now make up a relatively larger part of the population. However, the redistribution was not very substantial meaning the impact was relatively low (see table 7).

The change in the statistical standards had a much greater impact on the employment-to-population ratio as shown in figure 7, in this case highlighting the difference between urban and rural areas in particular. For rural areas the change in the statistical standards had a major impact (reduction of 12.6 percentage points) while the change in population definition and estimates had a relatively minor impact. In urban areas both changes had a relatively low impact on the employment-to-population ratio meaning the new ratio overall is 1.1 percentage points lower than the old ratio. The overall national employment to population ratio was 6.2% lower once all the changes were applied, driven almost fully by the change in the statistical standards.

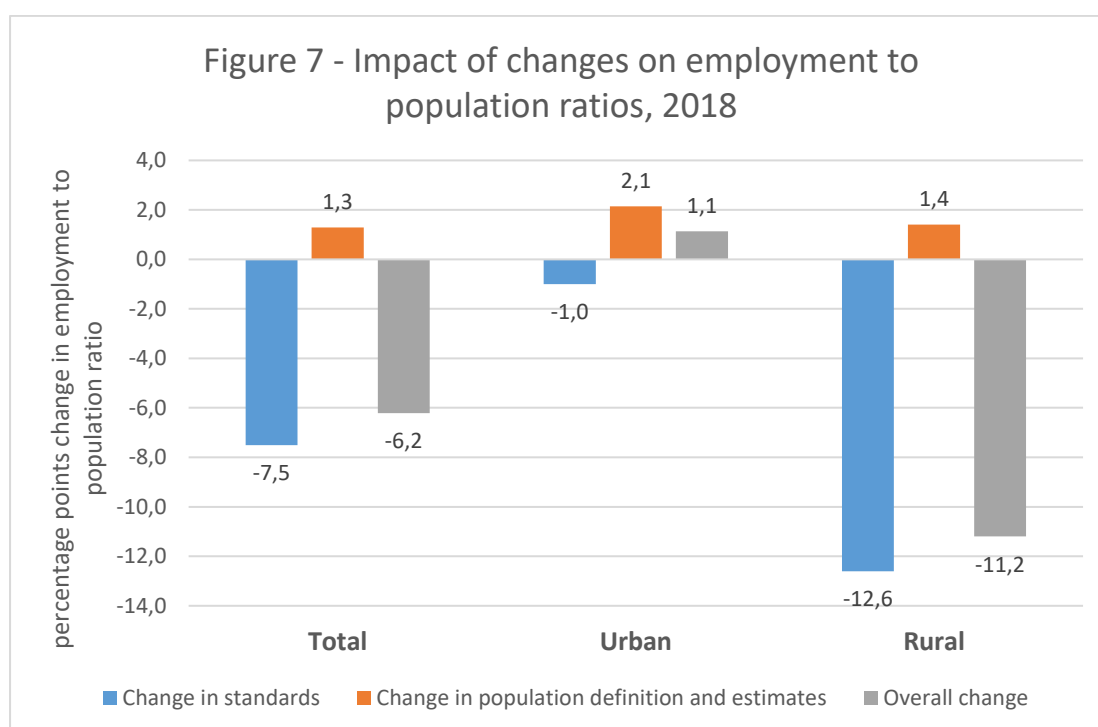


Table 7 - Impact of changes on employment to population ratio, 2018

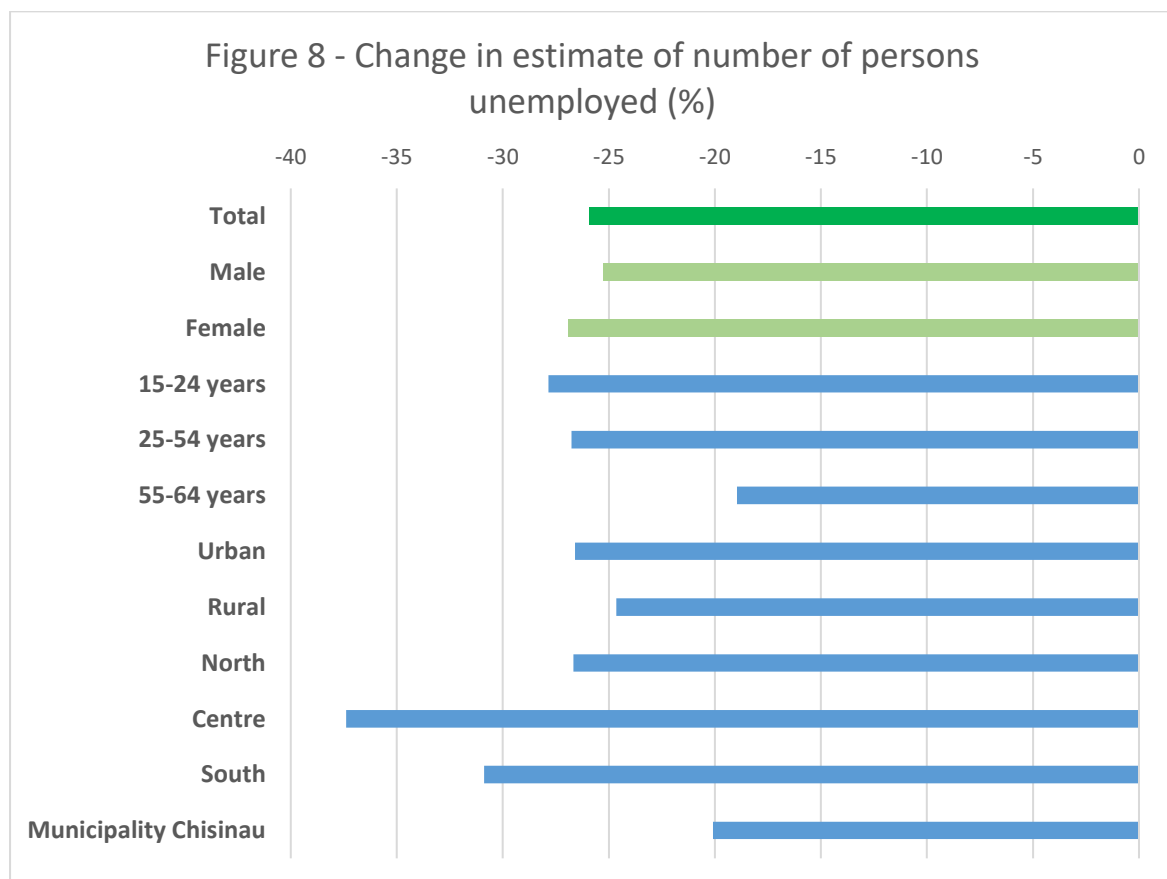
	2018 average			Change due to population estimates	Total change (old to new estimate)
	Old standards, stable population (old estimate)	New Standards, stable population	New Standards, new population (new estimate)		
	%			percentage points	percentage points
Total	42.0	34.5	35.8	1.3	-6.2
Sex					
Males	44.2	36.2	38.6	2.4	-5.6
Females	40.0	32.9	33.3	0.4	-6.7
Age					
15-24 years	19.3	16.0	17.1	1.1	-2.2
25-54 years	53.1	46.3	50.1	3.8	-3.1
55-64 years	46.6	35.3	36.1	0.8	-10.5
65+	16.1	6.0	6.4	0.5	-9.7
Urban/Rural					
Urban	40.9	39.9	42.0	2.1	1.1
Rural	42.8	30.2	31.6	1.4	-11.2
Zone					
North	42.9	35.9	37.9	2.0	-4.9
Centre	42.3	27.8	28.4	0.6	-13.8
South	35.1	28.7	30.3	1.6	-4.8
Municipality Chisinau	46.3	45.7	46.8	1.1	0.6

2.2.2 Impact of the new population definition and estimates on unemployment estimates

Number of persons unemployed

As shown in figure 8 and table 8 the estimate of the number of persons unemployed was reduced by 26% due to the change of the population definition and estimates. This reduction is the same as the reduction in the working age population (26%).

The old estimated number of persons unemployed for 2018 was 38,100. When the new statistical standards were applied this increased to 44,000 (+15%), but when the new population estimates were introduced this fell to 34,100 (-26%). As a result, the new estimate of unemployment, with all changes made was 4,000 or 11% lower than the old estimate for 2018.



As can be seen from figure 8 the reduction due to the population definition and estimates change was seen in all subgroups. The size of the reduction was relatively similar for most groups, although with relatively larger decreases in the centre and south than the Chisinau Municipality. However, the size of the groups involved were relatively small so we must be careful trying to assign an explanation for differences in the impact. The clear message is that the reduction in the population estimates caused the unemployment estimate to be lower for all subgroups.

Table 8 - Impact of changes on estimates of number of persons unemployed, 2018

	2018 average						
	Old standards, stable population (old estimate)	New Standards, stable population	New Standards, new population (new estimate)	Change due to population estimates		Total change (old to new estimate)	
				000's	% of old estimate	000's	% of old estimate
	Persons 000's						
Total	38.4	44.0	34.1	-10.0	-26	-4.4	-11
Sex							
Males	22.4	26.9	21.2	-5.7	-25	-1.2	-5
Females	16.0	17.1	12.8	-4.3	-27	-3.2	-20
Age							
15-24 years	6.8	7.7	5.8	-1.9	-28	-1.0	-14
25-54 years	27.1	31.4	24.1	-7.3	-27	-3.0	-11
55-64 years	4.4	4.7	3.9	-0.8	-19	-0.5	-11
65+	*	*	*	*	*	*	*
Urban/Rural							
Urban	25.2	25.4	18.7	-6.7	-27	-6.6	-26
Rural	13.2	18.7	15.4	-3.3	-25	2.2	17
Zone							
North	12.5	14.2	10.9	-3.3	-27	-1.6	-13
Centre	5.5	8.3	6.3	-2.1	-37	0.7	13
South	4.3	5.3	4.0	-1.3	-31	-0.2	-6
Municipality Chisinau	16.2	16.2	12.9	-3.2	-20	-3.2	-20

* Too few observations to provide an estimate

Unemployment rate

Like the employment to population ratio the unemployment rate is impacted if the distribution of the population changes. In the case of the unemployment rate the estimates after the new population definitions and estimates were applied were very close (almost identical) to those using the old population estimates. At the total level the unemployment rate was the same using the old and new population estimates (4.1%, see table 8). This means only the introduction of the new standards had an impact on the unemployment rate, increasing it from 3.0% to 4.1%. The greatest impact of the new population estimates on the unemployment rate for any subgroup was 0.2 percentage points, a level of difference, which is not statistically significant.

This pattern was similar across most zones. The introduction of the new standards in general caused a higher unemployment rate to be recorded, while the change in population definition and estimates had little impact. The only exception was in Chisinau where neither change had a large impact on the unemployment rate (old estimate 4.8%, new estimate 5.0%).

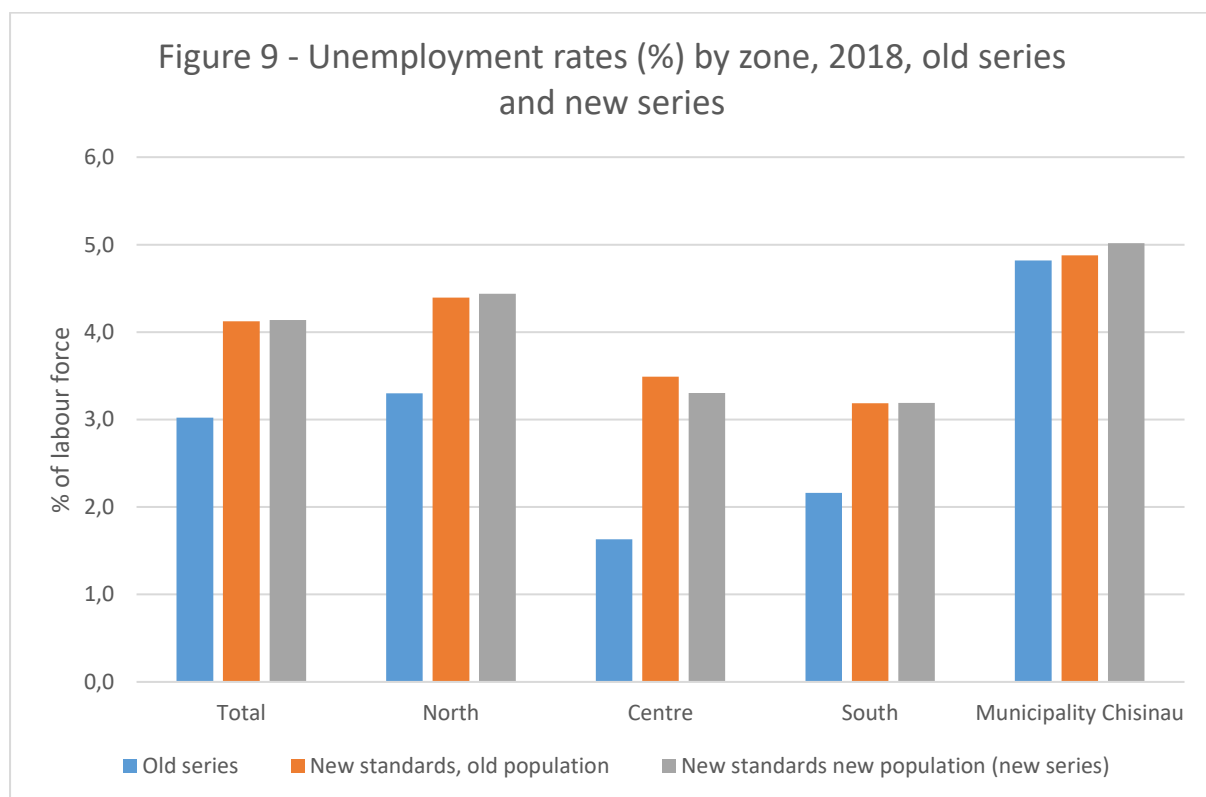


Table 9 - Impact of changes on the unemployment rate, 2018

	2018 average			Change due to population estimates	Total change (old to new estimate)
	Old standards, stable population (old estimate)	New Standards, stable population	New Standards, new population (new estimate)		
	Persons 000's			percentage points	percentage points
Total	3.0	4.1	4.1	0.0	1.1
Sex					
Males	3.5	5.1	5.1	0.0	1.6
Females	2.5	3.2	3.1	-0.1	0.6
Age					
15-24 years	7.4	9.9	9.7	-0.2	2.2
25-54 years	3.0	4.0	4.1	0.1	1.0
55-64 years	1.9	2.7	2.6	-0.1	0.7
65+	*	*	*	*	*
Urban/Rural					
Urban	4.5	4.6	4.8	0.2	0.3
Rural	1.9	3.6	3.6	0.0	1.7
Zone					
North	3.3	4.4	4.4	0.0	1.1
Centre	1.6	3.5	3.3	-0.2	1.7
South	2.2	3.2	3.2	0.0	1.0
Municipality Chisinau	4.8	4.9	5.0	0.1	0.2

* Too few observations to provide an estimate

3. Change in sampling design and frame:

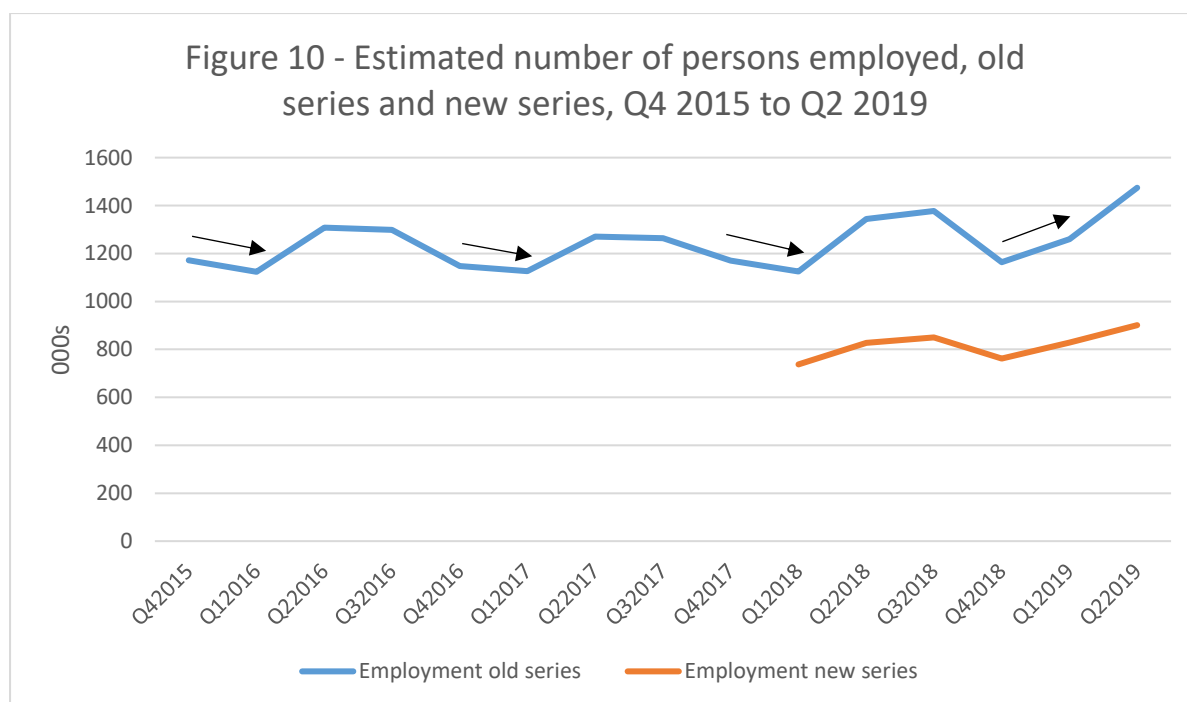
The changes made to the sampling design and sample frame are outlined in more detail in the annex. Updates to sampling frames are inevitable due to changing residential patterns over time. In Moldova, as in many countries these updates are made after a Census of Population. In this case the sampling frame was based on Census of Population 2004 up to Q4 2018, changing to Census of Population 2014 from Q1 2019.

An important point to understand is that no direct comparison of estimates using the old and new samples is possible as they were never in use in the same period of time. The old sample design and frame were used up to Q4 2018, while the new design and frame were introduced fully in Q1 2019. It is not unusual by international practice to introduce a new sample in this way as running operations with two different samples simultaneously can be very expensive and complex.

While no direct comparisons are possible for a single period of time, we can review the time series between 2018 and 2019 to comment on the type of impact we believe occurred and why. Again, we will focus on estimates of employment and unemployment, although other series are of course also impacted.

Employment and unemployment estimates

Figure 10 shows the movement in the estimates of number of persons employed from Q4 2015 to Q2 2019. Estimates are presented for the 'old' series and the 'new' series, which is only available from Q1 2018. It is evident that the data follows a clear seasonal pattern. Typically, the employment estimate falls between the fourth quarter of the year and the first quarter of the following year due to the low agricultural season, as shown by the arrows on the graph. It then increases between quarter 1 and quarter 2 each year. The size of the increases and decreases can vary. However, between Q4 2018 and Q1 2019, when the sample changed, the employment estimate increased, both under the old series and the new series. This suggests that the new sample has caused an upward break in the series for employment that is also seen in other key series.



To understand how large this break in series maybe it is useful to look a longer time series as shown in table 10. The table shows the maximum, minimum, median and mean change between quarter 4 and quarter 1 each year from Q4 2006 onwards for 4 key indicators

We can see that starting with Q4 2006 to Q1 2007, up to Q4 2017 to Q1 2018 the employment estimate fell in each year by somewhere between 2% and 10.3% with an average reduction of 5.9%. However, between Q4 2018 and Q1 2019 it increased by 8.3% (+14.2% from the average of 2006 to 2018). For the other indicators:

- The employment to population ratio also fell between Q4 and Q1 each year, by between 0.8 percentage points and 4.1 percentage points with an average decrease of 2.4 percentage points. Between Q4 2018 and Q1 2019 it increased by 3.2 percentage points (+5.6 percentage points from the average between 2006 and 2018).
- The estimated number of persons unemployed typically increased, with the exception of only one year. As the number of persons unemployed is much lower than the number employed the percentage changes can be much larger. We see an average increase of 39.5% and a median (which is less effected by extreme changes) increase of 25.9%. The change from Q4 2018 to Q1 2019 was +103.5%, +64% from the average between 2006 and 2018 or +77.6% from the median.
- The unemployment rate increased in each year between Q4 and Q1, at least by 0.1 percentage points, or by up to 5.0 percentage points. On average the increase was 1.9 percentage points (2.0 percentage points median). Between Q4 2018 and Q1 2019 it increased by 3.0 percentage points, 1.1 percentage points more than the average between 2006 and 2018.

In summary, we can conclude that there has been a break in the 4 key series highlighted between Q4 2018 and Q1 2019. In each case the indicator appears to have been increased by the change in sample. The explanation for this relates to the types of area now introduced to the sample which were not in the old sample frame because they did not have large residential populations in 2004, but had grown substantially by 2014. These newer housing areas are more urbanised and have higher levels of labour market engagement than average. This caused employment and unemployment estimates to increase when the updated sample was introduced.

Table 10 - Q4 to Q1 change in key estimates, 2006 to 2019

	2006 to 2018				Change Q42018 to Q12019
	Max change	Min change	Median change	Mean Change	
Employment (%)	-2.0	-10.3	-6.0	-5.9	8.3
Employment to population ratio (pp)	-0.8	-4.1	-2.4	-2.4	3.2
Unemployment (%)	143.5	-4.6	25.9	39.5	103.5
Unemployment rate (pp)	5.0	0.1	2.0	1.9	3.0

While we can observe that a break in series has occurred and its direction (an upward shift on key indicators) there is insufficient information available to confidently estimate the size of the break in series. This is because in reality there are multiple factors that could cause movements in the series between Q4 2018 and Q1 2019 including:

- Normal seasonal effects (as described above)

- Actual trends in the labour market (general increases or decreases)
- Normal uncertainty of statistical measurement
- The impact of the sample update

As we cannot break down the movement between Q4 2018 and Q1 2019 between these elements it is impossible to isolate only the change because of the sample update. As a consequence, we cannot recalculate old series to provide a consistent time series between 2018 and 2019. Users of the data should be aware of these breaks when analysing the data.

Among the 4 indicators the shift in the unemployment rate appears to be the least substantial as the new sample caused both employment and unemployment to increase meaning both the numerator and denominator of the unemployment rate were higher.

4. Updated information available under the new standards:

The earlier parts of the note focussed on explaining the impact of changes made to methodology on existing statistical series. While this is a key concern for users, it is not the only important change that has taken place. As well as applying latest international standards and practices, the updates allow a greater range of data to be generated for analytical purposes. Specifically, new developments include:

- A wider range of indicators on labour underutilization now including time related underemployment and a group referred to as the potential labour force.
- Separate statistics showing the number of people doing unpaid work to produce foodstuff to support their household and family, mainly farming.

The impact on existing indicators has already been extensively discussed earlier in the report. The focus of table 11 is the range of key indicators now available when the new statistical standards are applied, as compared to those available under the previous standards.

Table 11 - Selected key indicators, old and new standards, 2018

	Old Standards, stable population	New Standards, new population
Working-Age Population (15+)	2982,9	2220.2
Labour Force (LF)	1290.7	828.1
Employed	1252.2	794.1
Time-Related Underemployment (TRU)	35.2 ^a	27.0
Unemployed	38.4	34.1
Outside the LF	1692.2	1392.1
Potential Labour Force (PLF)	9.6 ^a	18.4
PLF: Seeking, not available	1.5 ^a	1.3
PLF: Available, not seeking	8.1 ^a	17.1
Others outside the labour force	1682.6 ^a	1373.6
Subsistence food producer	*	894.6
	Old	New

	Standards, stable population	Standards, new population
Rates (%)		
Participation rates		
Labour force participation rate	43,3	37.3
Employment to population ratio	42,0	35.8
Subsistence foodstuff producer rate	*	40.3
Labour underutilisation rates		
LU1 = Unemployment	3.0	4.1
LU2 = TRU + Unemployment	*	7.4
LU3 = Unemployment + PLF	*	6.2
LU4 = TRU + U + PLF	*	9.4

^aSimilar indicators were already being published by NBS although not covered by the 13th ICLS standards

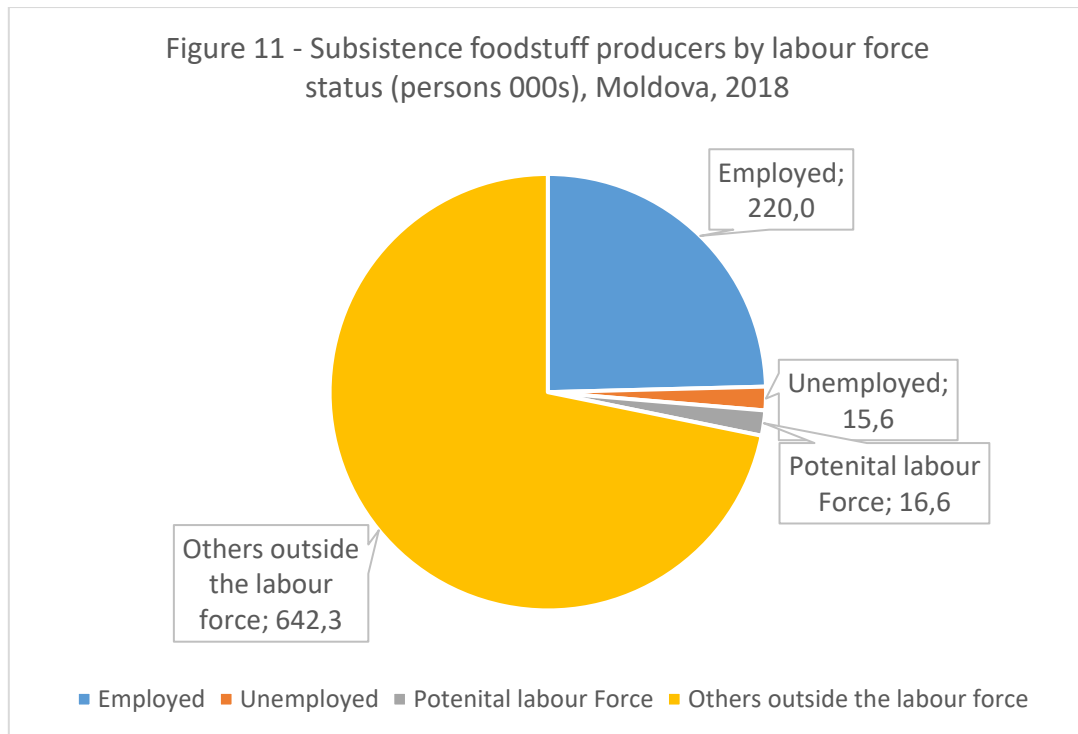
Among the highlights from table 10 we can see:

- An indicator showing the prevalence of *work done to produce foodstuff for family consumption (subsistence foodstuff producers)*. On average during 2018, 894,600 were doing this type of work, representing 40.3% of all people aged 15+. Some of these people were identified as employed under the old standards (if they worked more than 20 hours a week), with the remainder within the group called *Outside the labour force* meaning no information was presented on the unpaid work activities they were doing.
- In addition to 34,100 unemployed, we can see an addition 27,000 people in *time-related underemployment* (wanting and available to work more hours), and 18,400 in the *potential labour force*. This means that while the unemployment rate was 4.1%, the widest measure of labour underutilization was 9.4%. It should be emphasised that these measures should be seen as supplementary, not in competition or as replacements for the unemployment estimates. They highlight groups of people who are placing some pressure on the labour market, but perhaps not to the same extent or in the same way as those who are unemployed (without employment, immediately available and looking for work).

Another useful analysis which is now enabled is a more detailed perspective on those doing work to produce food for family consumption. This allows us to see how people combined different types of work to support their family and can highlight important differences between urban and rural areas, men and women, or other groups in the population. The new standards recommend producing separate statistics on this group. Various types of analysis are possible. One approach is to look at the labour force status of these people, as presented in Figure 11. We can see that, of the 894,600 foodstuff producers, approximately one quarter (220,000) were also employed, as they had some other job or business, they were doing to generate an income.

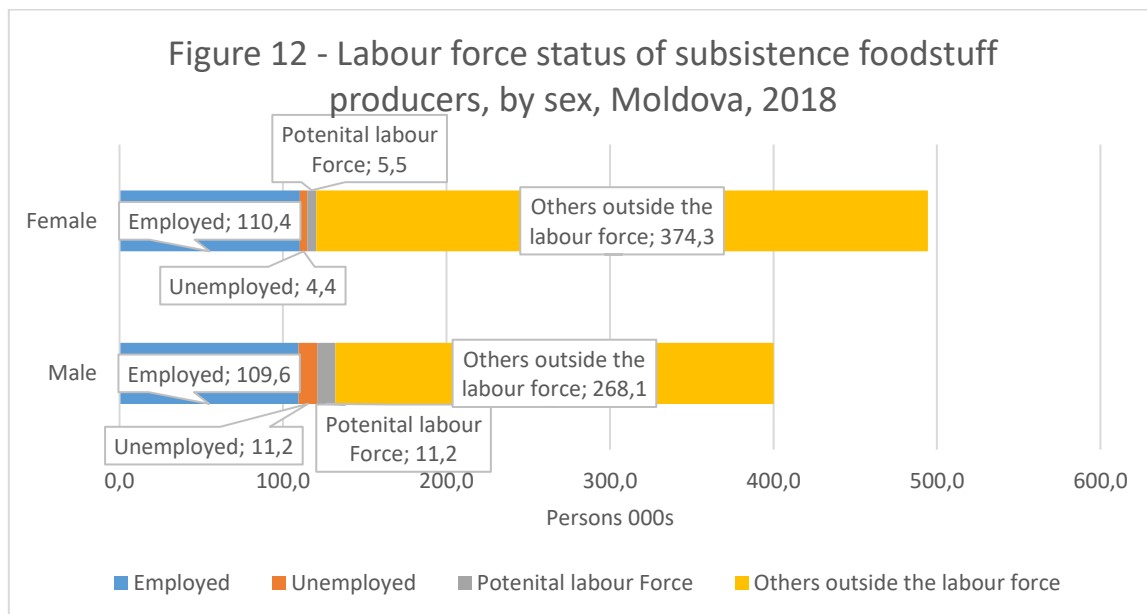
Of the remaining three quarters (674,600), low numbers were unemployed or in the potential labour force, with the large majority (642,300) falling into the *Others outside the labour force* group.

Figure 11 - Subsistence foodstuff producers by labour force status (persons 000s), Moldova, 2018



We can extend this analysis in various ways. Figure 12 shows that there were more females than males engaged in subsistence foodstuff production. However, male subsistence foodstuff producers were relatively more likely to have some engagement with the labour market, either as employed, unemployed, or being in the potential labour force.

Figure 12 - Labour force status of subsistence foodstuff producers, by sex, Moldova, 2018



Further, we can compare the labour force engagement of subsistence foodstuff producers to those not doing this type of work. Table 12 shows that subsistence foodstuff producers had lower employment to population ratios but higher rates of labour underutilization, as compared to people who were not subsistence foodstuff producers. In combination, this suggests that this type of work was creating some barriers to entry to the labour market, while still not satisfying the needs of individuals for labour market engagement.

Table 12 - Labour Force Status, Subsistence foodstuff producers and non-subsistence foodstuff producers (new standards), 2018

	Total	Subsistence Foodstuff Producers	Non-subsistence foodstuff producers
Participation rates	%	%	%
Labour force participation rate	37.3	26.3	44.7
Employment to population ratio	35.8	24.5	43.3
Labour underutilisation rates			
LU1 = Unemployment	4.1	6.8	3.1
LU2 = TRU + Unemployment	7.4	10.8	6.1
LU3 = Unemployment + PLF	6.2	13.1	3.4
LU4 = TRU + U + PLF	9.4	16.8	6.4

5. Conclusions:

Since 2018 substantial updates have been made to the LFS of Moldova and the related statistical series. This has created some breaks in series that this note has attempted to explain.

The purpose of the changes has been to introduce updates to methodology and reference concepts aimed at generating more comprehensive and targeted statistics, reflecting latest international standards, practices and information about the population in Moldova. The analysis in this note has focussed on a small but key set of the full set of labour market indicators.

Among the key points to remember are:

- The latest international statistical standards, which have now been implemented, more closely align key labour market definitions with user needs, reflecting much international experience and discussion. In addition, a much richer set of data can now be generated on the different types of work people in Moldova do, how they interact with the labour market, and how these things vary for different groups of people. This change has had important impacts on existing statistical series such as those on employment and unemployment.
- The latest information on the population has now been integrated ensuring labour market statistics are as up to date as possible with respect to population structure and residential location.

Annex: Description of methodological changes made to NLFS in 2018 and 2019

1. Introduction of updated statistical standards

Those publishing labour statistics in different countries often refer to the 'ILO (International Labour Organization) standards' as the basis of the definitions of employment and unemployment used. The term 'ILO standards' refers to standards which are adopted at the International Conference of Labour Statisticians (ICLS). The ILO hosts the ICLS once every 5 years and many topics have been covered over time⁴. Possibly the most visible and widely applied standards are those that set the statistical definitions for employment and unemployment. The standards widely used in recent decades for this purpose were adopted in 1982 at the 13th ICLS.

Since 1982 the range of labour market statistics available in countries have expanded massively and the definitions agreed in 1982 have come into very wide use. While they have been very useful, demands increased over time to review the 1982 standards to provide a wider range of work statistics more closely aligned to user needs. In response to this demand, the 18th ICLS in 2008 requested a review of the 13th ICLS standards. This review took place through a major development and consultation process, and new standards were adopted at the 19th ICLS in 2013.

Specifically, the key changes were:

- A new 'forms of work' framework has been established which identifies different types of work that people do depending on what is produced from the work and who the beneficiary is. Within this framework employment is one form of work (work for pay or profit). There is also a recognition that people can be engaged in multiple forms of work in the same period of time, something not possible under the old framework that assigned only one labour market status to each individual (employed, unemployed or not economically active). Among other things this enables total work burden to be measured and gives prominence to the unpaid work people do.
- The new definition of employment is narrower than before. In particular, under the 1982 standards, people who were producing foodstuff for their own household consumption were identified as employed. Under the new standards, these people are not identified as employed unless what they produce is mainly intended to be sold. Those producing goods mainly for the household's consumption are now identified as doing 'own-use production of goods', and it is recommended that statistics on this group are also published, particularly where the size of the group is significant, as in Moldova.
- The unemployment definition did not substantially change, but additional indicators of labour underutilization have been defined to provide a more comprehensive picture of people with an unmet need for employment.

The impact of these changes is heavily dependent on the economic context of the country and existing practices. In a country where 'own-use production of foodstuff' is common, and it was being measured as employment, then the introduction of the new statistical standards would be expected to lead to a lower estimate of employment. A second consequence would be that the number of people unemployed would be expected to be higher, because some of those doing own-use production of goods would be looking and available for work, thus unemployed. However, the impact of introduction of the new standards should not only be seen in terms of changes to existing indicators. The new standards enable additional indicators to be published, providing a more detailed range of information on labour market engagement and work.

⁴ See : <https://ilostat.ilo.org/resources/methods/icls/icls-documents/>

In the case of Moldova 'own-use production of foodstuff' is a common activity (on average 40% of the working age population were doing this type of work in 2018, as highlighted in the report). Under previous practices these people were counted as employed if they did this work for more than 20 hours in the week. Under the new standards this group would be removed from employment and included in a separate indicator of own-use production of foodstuff (also referred to as subsistence foodstuff producers). As some of these people can be looking and available for work it is also expected that estimates of unemployment would increase as a result of the introduction of the new standards, as demonstrated in the report.

Introducing the new standards through a LFS required the questionnaire to be updated. NBS of Moldova did this review and made the necessary changes in the questionnaire from the 1st quarter of 2018 onwards. The questionnaire was updated to allow some estimates to be continue to be made which were conceptually consistent with the 1982 (old) standards. This is an important feature of the new standards, which is not always the case when statistical standards are updated. The benefit is that there is we can compare the estimates for the old and new standards from Q1 2018 onwards and illustrate the impact, as shown in section 2.1 of the report.

Summary:

The new standards include a definition of employment that is narrower than the previous standards. This is expected to lead to a lower estimate of employment and a higher estimate of unemployment. It also proposes more detailed information to be published including participation in own-use production of goods and additional indicators of labour underutilization to give a more complete picture of work and labour underutilization.

2. Population estimate revisions and changes in the reference population

Estimates of the population are used to calculate weights for the NLFS data each quarter. When the results of a Census of Population become available it is a normal practice to use the updated information to revise population estimates, and as a result also the labour market estimates. NBS has created new population estimates using the data from the 2014 Census of Population and applied them to the NLFS estimates from Q1 2019 onwards, as well as recalculating estimates for 2018 to allow comparisons.

At the same time NBS has applied an updated population concept. Up to 2019 the population was based on the 'stable' population incorporating all persons who were identified as having a permanent residence in Moldova. From 2019 onwards we are now applying the 'usually resident population' which is a concept widely used internationally for population and social statistics. This means that only persons who have an expected duration of residence in Moldova of at least 9 months are considered part of the population. The main impact of this is to reduce the population as the 'usually resident population' excludes people who are resident outside Moldova for periods of at least 9 months, for example those working and living in neighbouring countries. Some of these people retain a permanent residence in Moldova and were included in the old 'stable' reference population.

The NBS has completed an exercise to calculate the 'new' population from Q1 2018 onwards. The 'old' population is also available up to Q4 2018 meaning the results can be directly compared for 2018. The impact for different population subgroups is shown in table A1 below.

Table A1 – Impact of change in population definition and estimates on population subgroups, 2018

	2018 average			
	Stable population (old)	Usually resident population (new)	Difference (000's)	Difference (%)
	Persons 000's			%
Working age population	2982.9	2220.2	-762.7	-26
Sex				
Males	1,406.8	1,033.9	-372.9	-27
Females	1,576.1	1,186.3	-389.8	-25
Age				
15-24 years	441.2	319.6	-121.6	-28
25-54 years	1655.1	1146.6	-508.5	-31
55-64 years	474.4	393.8	-80.6	-17
65+	412.2	360.1	-52.0	-13
Urban/Rural				
Urban	1310.7	884.1	-426.6	-33
Rural	1672.2	1336.1	-336.1	-20
Zone				
North	865.8	622.0	-243.8	-28
Centre	850.2	662.0	-188.2	-22
South	577.4	414.1	-163.3	-28
Municipality Chisinau	689.5	522.1	-167.4	-24

The precise impact of the population estimate changes on labour market indicators is dependent on a range of issues. As the new working age population is substantially lower when the new population definition is applied, it is expected all estimates of the number of people in different labour market statuses would also be lower. However, the impact on rates and ratios will depend on how the distribution of the population changes. The distribution in this case will have changed in various ways, across age groups, zones etc. In addition, the group now excluded are a specific group, namely those who are not usually resident in Moldova but have a permanent residence in the country. The impact of the change on labour market related rates and ratios (e.g. unemployment rate) is a factor of all of those changes and the direction of change is not easy to predict given the number of inter-related issues involved. The actual impacts are discussed in the main body of this report (section 2.2).

Summary:

In line with normal practice the estimates of population have been updated using data from the 2014 Census of Population. In addition, the population concept has changed from 'stable' to 'usually resident population' to be in line with international practices. The combined effect of these changes is to reduce the overall working age population and estimates of people in employment, unemployment and other labour market statuses. Because this also changes the structure of the population used for weighting, key rates such as the unemployment rate and employment to population ratio were also impacted, but not as substantially.

3. Change in sampling design and frame:

In the first quarter of 2019 a new sample design and frame have been introduced. The sampling frame (the set of dwellings from which the sample is selected) is now based on the 2014 Census of Population. Up to Q4 2018 it had been based on the 2004 Census of Population. This has had an important impact as some more recently developed areas of Chisinau in particular were not included in the old sampling frame but are now included. Because these areas have high rates of labour market participation, their introduction has increased estimates of employment and unemployment.

In addition, a new sampling design has been introduced. Up to 2018 a two-stage stratification approach was applied with an overall sample size of 7,200 dwellings per quarter. At the first stage, 150 Primary Sampling Units (PSU) were selected, using probability proportional to size (PPS) sampling. Communes (the second-level administrative division) were used as PSUs with some exceptions (towns of Cahul and Ungheni were each divided into 2 PSUs, Balti city was divided into 5 PSUs and Chisinau city was divided into 20 PSUs). In rural PSUs a listing was done starting from the list of electricity consumers, while in urban area the list of electricity consumers was used without any updating. At the second stage a simple random sample (SRS) of addresses within each PSU was selected.

From Q1 2019 onwards, at the first stage, a sample of 150 PSUs continued to be chosen, but the nature of PSUs are different to the previous sample. Now, one PSU is an aggregation of 2 sections from the last census (each section was composed of 5-7 enumeration areas (EAs)), with the exception of Chisinau municipality, urban area, where the PSU is equal to an EA. In all selected PSUs a map updating was done. After this, within each PSU, a random sample of dwellings has been selected with an overall quarterly sample of 7,620 dwellings.

Summary:

The sampling frame and design have been updated. The primary impact on estimates from this relates to the inclusion of newer residential areas in Chisinau and other locations. The result of which has been an upward break in key labour market series as discussed in section 3.