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Trends and Prospective Estimates of the Number of Households in the Russian Federation

Abstract. According to the Law of the Russian Federation “On the All-Russian Population Census” (2002) a household is considered as a group of people living in a dwelling house, apartment or room, or part of a dwelling house or apartment that jointly provides itself with the necessary means of subsistence and which unites all or part of its income, or a person residing in a residential building, an apartment or a room, or a part of an apartment house or apartment and independently providing itself with the necessary means of subsistence.

According to the calculations of 2009, based on Rosstat’s forecast, the number of households in Russia was to make up from 52.5 million by the low estimate to 58.9 million by the high estimate in 2030. Like any forecast, these estimates require regular revision, refinement due to the appearance of new data.

Based on the current trends in the development of households in the world and in Russia, the article attempts to provide updated estimates of changes in the number and structure of Russian households at the end of 2030.

Key words: household, forecast, household structure, population census.

JEL codes: J11, J12

Applied demography, in those sections dealing with the consumption of goods, services and works, takes interest in not only the population as a whole, and not only families, but also households, their structure, number, location, socio-economic characteristics, their consumer particularities and requests.

A household is characterized by how it is running, a place where it resides, and by family relationships, but not only. A private household, unlike a family, can consist of one person. According to the UN definition [UN DESA, 2017: 192], it is assumed that there can be one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person. Or a multiperson household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their resources and have a common budget; they may be related or unrelated persons or a combination of persons both related and unrelated. In households of homeless

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people, the main factor is not a dwelling as such, but it is running a household, including jointly, if the household consists of two or more people. In addition, institutional population is distinguished, i.e. population living in institutions such as military installations, correctional and penal institutions, dormitories of schools and universities, religious institutions, hospitals and so forth. [UN DESA, 2017: 39].

According to the Law of the Russian Federation “On the All-Russian Population Census” (art. 6, item 1) a household is considered as a group of people living in a dwelling house, apartment or room, or part of a dwelling house or apartment that jointly provides itself with the necessary means of subsistence and which unites all or part of its income, or a person residing in a residential building, an apartment or a room, or part of an apartment house or apartment and independently providing himself with the necessary means of subsistence.” [Federal Law ..., 2002]. In the 2010 All-Russia Population Census, Rosstat allocates the population of private households, collective households and homeless households, accounting for 98.67%, 1.27% and 0.04%, respectively.

In contrast to the forecast of the number and age and sex structure of the population, after 2010 Rosstat ceased to publish regular long-term estimates of the number and composition of households, although official organizations in many countries, including statistical organizations, provide such forecasts to the public on an ongoing basis with periodic updates.¹

According to the calculations of 2009, based on Rosstat’s forecast, the number of private households in Russia was to make from 52.5 million in the lower estimate to 58.9 million in the higher estimate in 2030 [Demographic Yearbook ..., 2009: 510]. Like any forecast, these estimates require regular revision, refinement, in connection with the emergence of new data. The process of growth in the number of private Russian households went faster than anticipated in 2009. Already in the 2010 Census, the number of households exceeded the lower version of the forecast and amounted to 54.6 million.

Based on the current trends in the development of households in the world and in Russia, the article attempts to provide updated estimates of changes in the number and structure of Russian households at the end of 2030.

International trends

Several long-term trends are of great importance in determining predictive hypotheses for future estimates of the development of private households.

¹ In England, in particular, the responsibility for conducting and publishing household forecasts was recently transferred from the Ministry of Housing, Communities and Local Government to the Office for National Statistics (ONS). See: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/methodologies/2016basedhouseholdprojectionsforenglandchangestomethodology>

Table 1. Growth in the number of private households and decrease in the average number of people per household in some countries of the world between the 1960s and 2000s

| Countries | Years | Number of households, millions | Average household size | Years | Number of households, millions | Average household size |
|-------------|-------|--------------------------------|------------------------|-------|--------------------------------|------------------------|
| Canada | 1961 | 4.555 | 3.9 | 2016 | 12.437 | 2.4 |
| Mexico | 1960 | 6.429 | 5.4 | 2000 | 22.268 | 4.3 |
| USA | 1960 | 53.021 | 3.3 | 2016 | 126.220 | 2.5 |
| Peru | 1961 | 1.974 | 4.9 | 2007 | 6.754 | 4 |
| Japan | 1955 | 17.383 | 5 | 2005 | 49.062 | 2.5 |
| South Korea | 1960 | 4.345 | 5.5 | 2005 | 15.887 | 2.9 |

Sources: data from 1955 to 1961: Shryok H. S., J.S.Siegel and Associates, *The Methods and Materials of Demography*, Condensed Edition, Academic Press, 1976, p. 172; data for 2000–2016: UN Demographic Yearbook and data base (<http://data.un.org/Data.aspx?d=POP&f=tableCode:326>) ; for USA: <https://www.statista.com/statistics/183635/number-of-households-in-the-us/> ; for Canada: <https://www.ctvnews.ca/canada/highlights-from-census-2016-numbers-on-families-households-languages-1.3529425>

These include: the fragmentation of households, and, as a consequence, the growth of their numbers; decrease in the average size of households (the average number of people per household); the increase in the number of non-family households, primarily consisting of one person - the atomization of households; the increase in the number of households consisting of two people (a married couple without children, an incomplete family consisting of one parent and child); a decrease in the proportion of households consisting of three or more people [Shcherbakova, 2018].

The increase in the number of private households as a long-term trend is recorded in almost all countries for which there is reliable census information. In Table. 1 several examples are given.

The increase in the number of households is also observed as a medium-term trend. The total number of private households in the 28 countries of the European Union has increased by almost 22.3 million between 2006 and 2017, to 221.3 million.¹

The increase in the number of private households is accompanied by a decrease in the average number of people living in them. In Japan, in particular, in 45 years, this indicator decreased by 2 times, from 5 people per household in 1960, to 2.5 people on average in 2005 (see Table 1). These changes also have the character of a global trend, to some or other extent relevant to all countries in the world.

¹ Source: Eurostat (online data code: lfst_hhhnhtych) http://ec.europa.eu/eurostat/statistics-explained/index.php/Household_composition_statistics#Household_size

The average size of households is also declining in the European Union - between 2005 and 2017, the indicator fell from 2.4 people to 2.3 on average per household (see Figure 1).

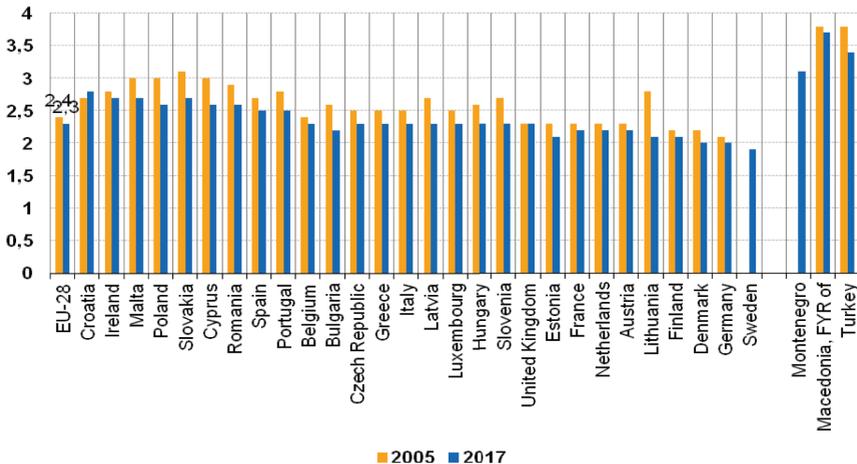


Fig. 1. Average number of persons per 1 private household in EU countries in 2005-2017

Source: Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/Household_composition_statistics#Household_size

In most of the 28 EU member states, the average number of people per household is less than 2.5, and in Germany, Denmark and Sweden, less than or equal to two. The decrease in the indicator also affected Turkey, where the average size of households for 15 years decreased from 3.8 to 3.4 [Shcherbakova, 2016; Shcherbakova, 2017].¹

Another global trend important for the formulation of predictive hypotheses is the increase in the proportion of one-person households. Solitary living, as a social phenomenon, was very rare until recently. In the middle of the 20th century, in many countries of Asia, Africa and Latin America, the share of private one-person households did not exceed 10%. As it was indicated in the UN materials, "...the majority of people in them [one-person households] are young, unmarried persons living in urban areas..." [Methods of Projecting..., 1974: 21, 22-24]. Today, solitary living has become a mass phenomenon in economically developed countries, and young people constitute a relative minority among all private one-person households.

¹ Eurostat data 2017 <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>
For more details, see: Shcherbakova, 2016 and Shcherbakova, 2017

Table 2. Proportion of private one-person households (per cent), in 1960 and 2017 in some European countries

| No. | Countries | 1960 | 2017 | No. | Countries | 1960 | 2017 |
|-----|----------------|------|------|-----|-------------------|----------------|------|
| 1 | Sweden | 21.9 | 51.4 | 12 | England and Wales | 13.4 | 31.1 |
| 2 | Finland | 21.5 | 41.3 | 13 | Ireland | 12.6 | 24.4 |
| 3 | Germany | 20.4 | 41.2 | 14 | The Netherlands | 11.9 | 37.5 |
| 4 | Denmark | 19.8 | 44.4 | 15 | Luxembourg | 11.5 | 35.3 |
| 5 | Austria | 19.7 | 37.0 | 16 | Malta | 11.3 | 19.7 |
| 6 | France | 19.6 | 35.1 | 17 | Cyprus | 10.8 | 23.5 |
| 7 | Belgium | 16.8 | 32.0 | 18 | Italy | 10.7 | 33.1 |
| 8 | Poland | 16.2 | 23.5 | 19 | Greece | 10 | 31.0 |
| 9 | Hungary | 14.5 | 32.5 | 20 | Portugal | 8.3 | 22.1 |
| 10 | Czech Republic | 14.2 | 30.8 | 21 | Bulgaria | 2.3 | 37.4 |
| 11 | Slovakia | 14.2 | 22.5 | | EU-28 | 29.3 (2006) | 33.6 |

Source: compiled by the author on: Eurostat; UN, *Methods of Projecting...*, pp.23-24

Since the middle of the twentieth century, the share of one-person households increased significantly. In Bulgaria, in particular, the indicator has grown by over 16 times. In 2017, in EU countries, one-person households comprised from one-fifth (Malta) to more than half (Sweden) all private households (Table 2).

The trend towards further fragmentation of households in the EU is also expressed in the growth of the aggregate share of private one-person households and two-person households, with a decrease in the proportion of households consisting of 3 or more people (see Figure 2).

Between 2005 and 2017, only one-person households consistently and continuously grew among 28 EU countries. The share of two-person households grew until 2010, and from 2012 it stabilized at the level of 31.5-31.9%.

Until 2010, inclusive, the largest percentage was for two-person households. Since 2011, the most common in 28 EU countries are one-person households. In 2015, one-person households accounted for exactly one third (33.3%) of all EU households.

In 2017, households consisting of one or two persons accounted for almost two-thirds (65.5%) of all private households in the EU-28.

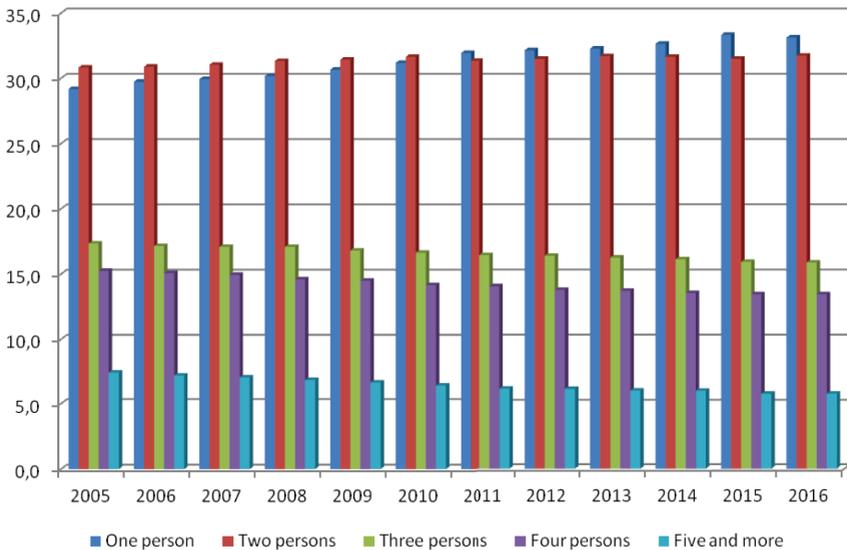


Fig. 2. Changes in the structure of households in 28 EU countries in 2005-2016 (%).

In 2005-2008, the data do not include Sweden

Source: Eurostat. http://ec.europa.eu/eurostat/statistics-explained/index.php/Household_composition_statistics#Household_size

Russian Trends and Forecast Hypotheses

In many respects, the trends in the development of households in Russia do not differ from those discussed above. First of all, it concerns the overall increase in the number of households [Mironova, Prokofiev, 2018].

Between the censuses of 2002 and 2010, the number of private households in Russia increased from 52.71 million to 54.56 million, by 1.85 million households (Table 3), with a total population decline of 2.31 million people and a reduction in the number of people living in private households by 1.79 million over the same period.

Table 3. Change in the number of households according to the censuses of 2002 and 2010

| No. | Federal Districts of the Russian Federation | 2002 million | 2010 million | Increase between censuses, thousand |
|-----|---|--------------|--------------|-------------------------------------|
| 1 | Russian Federation | 52.71 | 54.56 | 1849.25 |
| 2 | Central Federal District | 14.451 | 15.202 | 750.6 |
| 3 | Northwestern Federal District | 5.335 | 5.538 | 203.2 |

End of table 3

| No. | Federal Districts of the Russian Federation | 2002 million | 2010 million | Increase between censuses, thousand |
|-----|---|--------------|--------------|-------------------------------------|
| 4 | Volga Federal District | 11.420 | 11.577 | 157.4 |
| 5 | Ural Federal District | 4.596 | 4.750 | 154.0 |
| 6 | Siberian Federal District | 7.276 | 7.417 | 141.5 |
| 7 | Far Eastern Federal District | 2.451 | 2.471 | 20.0 |
| 8 | Southern Federal District | 4.876 | 5.064 | 188.1 |
| 9 | North Caucasian Federal District | 2.307 | 2.542 | 234.4 |

Source: Rosstat, census data for 2002 and 2010. The number of households in the Southern and North-Caucasian districts is recalculated according to the territorial division of 2010.

The most modest increase (20,000 households) was recorded in the Far Eastern Federal District. At the same time, the population of the District decreased between the censuses by 399.7 thousand people.



Fig. 3. Average number of people per 1 private household in the regions of the Russian Federation according to the 2010 census

The trend towards a decrease in the average size of private households is recorded in Russia since the 1994 Micro-census, when direct data (although based on a five percent sample) on this indicator first appeared. Earlier indirect data also confirm this trend.

The average number of people per household fell steadily from 2.84 (according to the 1994 Micro-census) to 2.71 (2002 Census), then to 2.58 (2010 Census) and to 2.39 (2015 Micro-census).

By 2010, in most parts of Russia, the average size of private households did not exceed 2.8 people.

The minimum values - 2.3 people and less per household (red colour on the map - Figure 3) were recorded in the northwest part of Russia (Novgorod, Pskov, Murmansk regions and the Republic of Karelia), in the central part - to the north and west of Moscow (Ivanovo, Smolensk and Yaroslavl regions), as well as in the northeast part of Russia (the Kamchatka Territory, the Magadan Region and the Chukotka Autonomous District).

Maximum indicators of the average number of persons per household (yellow colour on the map - Figure 3) are from 2.9 to 6.0 accounted for a number of subjects of the Russian Federation included in the North Caucasus Federal District (Republics of Dagestan, Ingushetia, Kabardino-Balkaria, Karachay-Cherkessia, North Ossetia-Alania, the Chechen and Stavropol Regions) and the neighboring Republic of Kalmykia. Another area of relatively high average household size is the Republic of Buryatia, Tuva and Sakha (Yakutia).

Despite the different speed with which there is a decrease in the average size of private households in the entities of the Russian Federation, one can argue for a transition to small-size households.

The demographic transition in relation to households, including the growth in the share of one-person households, takes place in Russia rather quickly.

According to the 1995 Micro-census, the share of one-person private households was 19.2%; according to the 2002 census it reached 22.3%; in the 2010 census it was 25.7%, and according to the 2015 Micro-census it reached 30.6%. By 2015, for the first time in Russia, the share of private one-person households almost equalled the share of two-person households - 30.57% and 30.70, respectively (Figure 4).

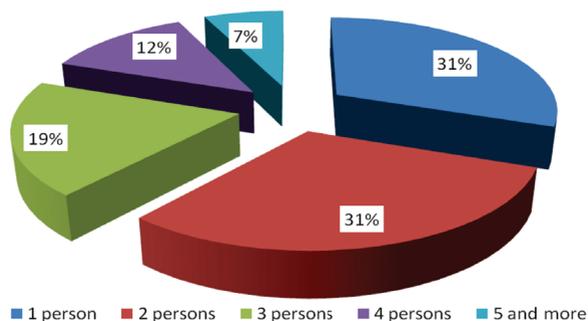


Fig. 4. Distribution of private households in the Russian Federation by number of residing people (both sexes) according to the 2015 Micro-census (%)

The most common private households in Russia consist of one or two people. Their aggregate share in 1994 was 45.4%, according to the 2010 Census it reached 54.2%, and in 2015 it was 61.3%.

The 2015 Micro-census provided additional information on households, although its regional component may not be so reliable. According to the 2010 Census, in particular, out of the total number of registered private households, 8.09% accounted for Moscow and 5.06% - for the Moscow region, in total - 13.15%. According to the 2015 Micro-census, these two regions accounted for only 8.1% of all households, and of this number Moscow accounted for 4.4%; i.e. almost 2 times less than in the 2010 Census.



Fig. 5. Percentage of private one-person households, according to the 2010 Census

Regional differences in the share of one-person households among all private households according to the 2010 Census are shown in Fig. 5.

In the regions marked in yellow in Fig. 5, the share of private one-person households is relatively small - no more than 21.7%. The minimum indicators were recorded in the regions with the highest birth rate in the Russian Federation — Ingushetia, Dagestan, Chechnya, (2.6%, 8.6% and 7.8%, respectively), Kabardino-Balkaria (14.1%) and Karachay-Cherkessia (14.4%) republics, as well as the Republic of Tuva (15.2%), where families with many children and even multi-generational families are still prevalent. In these ethnic societies, life alone is still a relative rarity, like it was in the 1960s in many countries around the world.

Unlike the middle of the last century, when in many countries of the world one-person households consisted mainly of young men, now in Russia (2010)

65.5% of the population of private one-person households are women. And these are women of older ages. The process of population ageing naturally affected households. Among men's one-person households, 55% are men over 45 years old, while among women living in a one-person household, the proportion of people of this age is 81% (2010).

Forecasting hypotheses

In Russia, the process of fragmentation of households will continue, which should lead to an increase in their numbers. However, the specific result in the change in the number of households will depend on the speed with which the average size of the household decreases, whether the population of Russia grows or how quickly it declines.

In the medium and long term, the average size of households in the Russian Federation will decrease, primarily due to an increase in the proportion of one-person households. This hypothesis arises from the experience of a number of European countries, where the share of one-person households is much higher than Russia, and the consistent growth of this indicator observed in recent decades in the Russian Federation, and regional differences in the country, which demonstrate the decrease-in-size trend.

Forecast of the number of households until 2030

Among the four main methods for forecasting the number of private households recommended by the UN at the time, two were chosen in this paper: a modified method of simply relating the number of households to the total population and the method based on heads of household coefficients (headship rate method) [Methods of Projecting..., 1974: 32-33].¹

The headship rates are obtained from census data by using the following formula:

$$h(i, j) = \frac{H(i, j)}{P(i, j)},$$

where P is the census population of the age group i of the sex j , and H is the number of heads of households in the age group i of the sex j .

Then the number of households in the forecast period is determined by the following formula [Methods of projecting..., 1974: 63-65]:

¹ In the censuses of most countries, as in Russia, the so-called heads of household (households) are no longer accounted for, but instead, the persons who have taken census of first, with respect to whom the other members of the household (reference person) are determined, are accounted for. In this article, the old name of the method is left for brevity.

$$\sum_{i,j} H(i,j,t+x) = \sum_{i,j} P(i,j,t+x) \cdot h(i,j,t+x)$$

In this forecast, the age coefficients of heads of households are taken from the 2010 census for the two sexes, along with an adjustment for the growth of indicators in the senior years in the forecast period, taking into account the trend of such changes fixed in the 2015 Micro-census.

The age-specific coefficients of heads of households are multiplied by the projected population at the corresponding ages, followed by a summation to obtain the total number of households¹. The proportion of the population living in private households, from the total population, is taken at the 2010 Census level and does not change during the forecast period. The results of calculations are presented in Table. 4 and Fig. 6.

Table. 4. The estimated number of households in the Russian Federation (million) in 2018-2030, by three variants of the population forecast (at the beginning of the year)

| Years | Variants of the forecast | | |
|-------|--------------------------|---------|--------|
| | Low | Average | High |
| 2018 | 58.174 | 58.195 | 58.234 |
| 2020 | 58.744 | 58.900 | 59.153 |
| 2025 | 59.701 | 60.521 | 61.790 |
| 2030 | 60.388 | 62.293 | 64.979 |

Source: calculated by the author on the basis of the headship rate method

In all three variants of the forecast, the number of households is growing in the forecast period (Table 4), despite the fact that the population of Russia according to the low variant of the forecast will decrease by 5.6 million people, and by the average variant - by 0.8 million people.

Fig. 6 also shows the dynamics of the number of households for the three variants of the forecast of the population of the Russian Federation.

The second method we apply is the trend-based method. It is based, firstly, on the dynamics of the number and structure of households, expressed in the indicator of the average size of a private household. And, secondly, on the population forecast. In the UN VII Manual, it is practically recommended to use the population forecasts as the basis for future calculations of the number of households, since the former are more common, reliable and enable reducing labour costs in the compilation of the latter [Methods of Projecting..., 1974: 52].

¹ The prospective population and its age structure for the forecasts of the number of households here and below are taken from the three variants of the Rosstat's forecast (low, medium and high), updated on February 22, 2018.

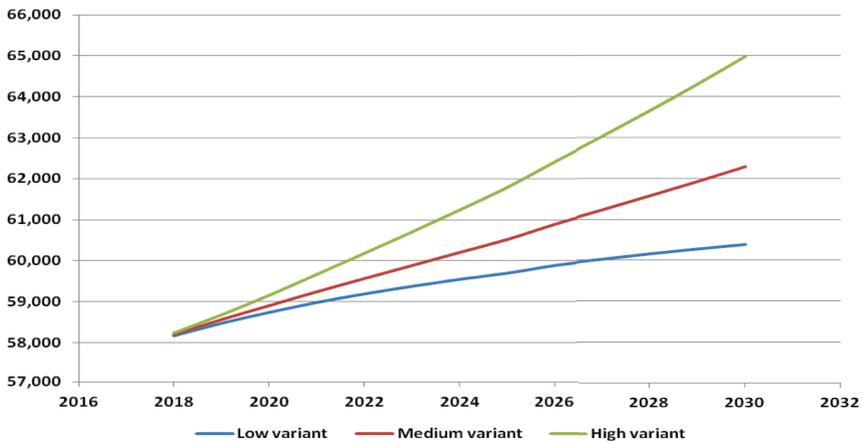


Fig. 6. Three variants of the forecast of the number of private households in the Russian Federation in 2018-2030 (million households)

Table 5. Estimated number of households in Russia (million) in 2018 - 2030 (for the beginning of the year)

| | Variants of population forecast | | |
|------|---------------------------------|---------|--------|
| | Low | Average | High |
| 2018 | 58.952 | 58.976 | 59.020 |
| 2020 | 59.618 | 59.801 | 60.091 |
| 2025 | 60.756 | 61.676 | 63.122 |
| 2030 | 61.457 | 63.559 | 66.471 |

Source: calculated by the author on the basis of the trend forecast of the average number of people per 1 private household

The dynamics of the average number of people living in one private household is adjusted by the results of the 2015 Micro-census, which recorded a further decrease in the average size of a private household.

The results of the forecast made by the second method also give grounds to state that the process of “atomization” of households, i.e. their further fragmentation, will continue and will give an increase in the number of households, even with a reduction in the size of population. This should be taken into account in different types of practical activities.

It has long been noted that in many social, economic and cultural processes it is the household, and not the individual, that is the object of study [Household Demography..., 1995: 1-2]. Increasingly, it is the households, including one-person households, who make a demand for certain goods and services. Examples

include expenditures of budgets of different levels, demand for housing, provision of private and public transport, participation in the labour force, demand for public services, including social security, caring for the needy, etc.

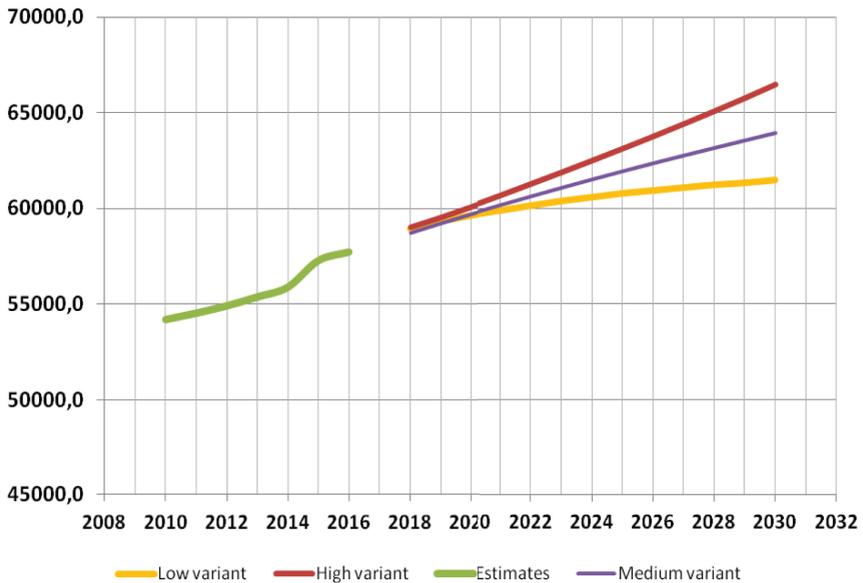


Fig. 7. Three variants of the forecast of the number of private households in the Russian Federation in 2018-2030 and an estimate for 2010-2016 (thousands of households)
Source: calculated by the author on the basis of the trend forecast of the average number of people per household

It looks that the improvement of methods, elaboration and periodic publication of household forecasts, including those for federal regions and municipal entities, will be in demand from business, the public and government authorities.

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