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Unmet need for healthcare in the Russian Federation: subnational retrospective modelling analysis (2014–2018)

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ABSTRACT

Introduction Unmet need for healthcare is a proxy indicator used to assess the performance of healthcare systems throughout the world. While the Russian Federation is committed to improving healthcare for its citizens, barriers to access remain.

Methods Using data from a region-level survey, we document and analyse the extent of the unmet need for healthcare at both national and subnational levels in the Russian Federation for the years 2014–2018. We used a panel fixed effects modelling approach to examine the link between unmet need and its correlates at the subnational level. We also used data from various sources that addressed the reasons underlying unmet need to interpret the findings from the modelling analysis.

Results Approximately one-third of the Russian population (34.7% in 2018) reported that healthcare was not received when it was needed with little change observed between 2014 and 2018. We observed significant variation across the various regions in Russia. The prevalence of unmet need was substantially higher in the regions of the Volga, Siberia and Far East Federal Districts. Our analysis revealed that the density of hospital beds and economic development across regions were correlated with the prevalence of unmet need. Dissatisfaction with healthcare services, perceived lack of effective treatments and financial constraints were the main reasons offered for forgoing healthcare when needed.

Conclusions An unanticipated positive link between unmet need and hospital bed density might be attributed to the low accessibility and quality of primary healthcare. High demand and supply of inpatient care do not compensate for the structural imbalances of the current healthcare model. Strengthening and improving the quality of primary care might significantly reduce the prevalence of unmet need.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Existing evidence documents unmet need for medications and pharmaceuticals, particularly, among the poorer segments of the population. None of the existing publications addressed institutional factors that might be contributing to unmet need on national or subnational level.

WHAT THIS STUDY ADDS

⇒ Approximately one-third of the Russian population reported that healthcare was not sought when it was needed with little change observed between 2014 and 2018. We observed significant variation across the various regions in Russia. The prevalence of unmet need was substantially higher in regions that included the Volga, Siberia and Far East Federal Districts. Our analysis revealed that the density of hospital beds and economic development at the oblast level were significantly correlated with the prevalence of unmet need.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Improving the quality of healthcare could potentially lead to substantial reductions in the prevalence of unmet healthcare needs. Responsible authorities should contemplate reinforcing the primary healthcare system, thus shifting the nation away from its heavy reliance on secondary healthcare providers.

INTRODUCTION

Access to effective healthcare is an important determinant of health and is thus instrumental to health improvement.[1] Moreover, equity in access to healthcare is a core component of assessments of health system performance and represents one of the main targets of Sustainable Development Goal 3 (SDG 3).[2] Given the complexities involved in capturing data on access to healthcare, it is frequently measured by a proxy variable based on information on whether an individual seeks or forgoes healthcare when it is needed. The overall unmet need for healthcare can be measured from clinical information (eg, medical records or clinical assessments) or may be self-reported. Subjective unmet need can be evaluated by the results of population surveys that provide insights into the extent

of inequity in the system. These surveys are particularly effective if this measure is complemented by healthcare utilisation data[3] that provide additional understanding of the perceived barriers to access to healthcare services.

Historically, the concept of unmet need has been anchored in the standard WHO Universal Health Coverage approach that includes three-dimensions: population coverage, service coverage and cost coverage.[4] Thus, unmet need could arise because of deficiencies in coverage associated with any or all of these three-dimensions. For example, specific individuals might be excluded from statutory coverage and some services might be excluded from statutory service packages. Additional costs (eg, user charges, extra billing and/or informal payments) could create shortcomings in overall cost coverage. Most recently, researchers have added a fourth-dimension to the existing theoretical paradigm that focuses on service access.[4] Accordingly, gaps in access to healthcare services might also relate to the physical availability of services, the inability to obtain services and the attitude of the provider, among other issues.[4]

Based on their analysis of data from the European Union Statistics on Income and Living Conditions (EU-SILC), the Organisation for Economic Co-operation and Development reported that 3.2% of the respondents did not receive healthcare when it was needed.[5] Moreover, the survey data revealed a significant variation in the extent of unmet need with a clear East-West divide. Similar results emerged from an analysis of the European Health Interview Survey (EHIS). Of note, the EHIS results indicated that affordability is one of the main reasons for experiencing unmet need in Europe. Similarly, patients in the USA also experience unmet need for healthcare; the extent of unmet need for physician and preventative services in the USA has increased over time. Hawks *et al*[6] analysed data from 1998 until 2017 and concluded that the extent of unmet need for physicians and preventative services in the USA increased by 2.7 percentage points during this interval (from 11.4% in 1998 to 15.7% in 2017).

The main reasons underlying the extent of reported unmet need in Sweden and Canada are lower socioeconomic status (proxied by poverty rates) and financial conditions.[7–9] In the USA, individuals who lack health insurance are more likely to forgo healthcare when it is needed.[10] In addition to individual and household level correlates, macroeconomic variables (eg, economic shocks and crises) can also explain the extent of unmet need.[11]

Russian Federation—institutional framework and overview of healthcare outcomes

The Russian Federation is determined to achieve SDG Target 3.8 which entails equal access to high-quality essential healthcare services without imposing a financial burden on households.[12] Most Russians (99%) are covered by nationwide obligatory medical insurance (OMI). The remaining 1% includes prisoners and military personnel who are covered by government programmes with the same benefits package as those provided by OMI.[13] The OMI benefits package is comprehensive and includes outpatient and inpatient care, medications (according to a list specified by federal and regional government agencies) and tertiary care provided primarily in federal healthcare settings. A substantial fraction of these benefits is funded by general federal and regional budgets.[14] The OMI rollout (beginning in 1993) led to increases in public spending on healthcare, although minimal when adjusted for inflation.[15] This is among the factors that explain why approximately two-fifths of the total healthcare expenditures in Russia are out-of-pocket (OOP). While these OOP healthcare costs were markedly smaller than those reported in India, they are comparable to those reported in Brazil and China.[16–19] Nevertheless, it is important to note that healthcare expenditures in Russia (in real US dollars, purchasing power parity) are much higher now, relative to the early 2000s.[16]

The last few years have been marked by a few notable reforms. The government of Russia initiated an ambitious plan to improve primary healthcare (PHC) to offer its citizens enhanced preventative healthcare services, including medical check-ups and screenings. In the Russian Federation, the multispecialty, publicly-owned polyclinic is a major provider of PHC. The capacity of the polyclinics varies from 100 000 to 120 000 individuals served in the larger cities to fewer than 15 000 in smaller towns and rural areas. Polyclinics provide preventative services as well as primary and specialty care for patients with chronic diseases.[20] Over the last decade, the scope of preventative services offered at the polyclinics has increased due to a large-scale federal programme referred to as 'dispensarisation'.[20] This programme has already successfully achieved some important goals. For example, in 2015, 60–80% of all new cancer cases were identified at the first or second stage.[21] This achievement has been accompanied by reductions in the use of inpatient care and hospital beds as well as a decrease in the average length of hospital stay.[22]

During the past two decades, the Russian Federation has also experienced a significant reduction in premature mortality and an overall increase in life expectancy.[23] Of particular note, substantial reductions in mortality were experienced by the working-age population (15–60 years of age) accompanied by a considerable reduction at age 60 years and older.[24 25] These improvements were the result of changes in behavioural risks as well as improvements in the Russian healthcare system. For example, the changes in federal alcohol policies led to a significant reduction in alcohol poisoning.[26–28] The observed reduction in mortality rates during this period is also partly attributable to the reduction in the prevalence of smoking, which has been decreasing since 2007.[29] Reduction in mortality due to tuberculosis has also been observed.[30]

Literature review on unmet needs in the Russian Federation

Despite these improvements, challenges remain. Preventable and treatable mortality in the Russian Federation remains higher than the lowest rates reported among EU nations.[31] Excess mortality due to the coronavirus disease-2019 (COVID-19) pandemic was particularly extreme[32] which may be attributed to an unsatisfactory healthcare system. These findings can be coupled with existing evidence suggesting that many individuals living in the Russian Federation still forgo healthcare when it is needed. As but one example, Nikoloski *et al*[33] measured the extent of unmet need based on results from the Russia Longitudinal Monitoring Survey (RLMS). As might be anticipated, the prevalence of unmet need was higher among the poorer segments of the population. Moreover, the extent of unmet need was highest for dental care and pharmaceuticals. Similarly, Balabanova *et al*[34] evaluated nationally-representative data collected in 2001 and reported that 11.3% of respondents had to forgo medical services frequently and 27.4% had to forgo such services sometimes. Likewise, 16.8% of respondents reported that they were never able to obtain medications and 32.0% reported that they could not obtain them sometimes.[34] In a follow-up study, Balabanova *et al*[35] reported that Russians were less likely to forgo healthcare than were inhabitants of countries that emerged from the former Soviet Union (Amernia, Azerbaijan, Georgia, Kazakhstan, Moldova and Ukraine); these findings echoed results from several studies that had focused exclusively on Russia.[36] Nonetheless, although the proportion of individuals has decreased over time, the poor and rural populations of the Russian Federation continue to forgo medications.[37] While financial difficulty is reported as the main reason for forgoing healthcare, Balabanova *et al*[34] highlighted several additional reasons, including self-treatment, purchase of pharmaceuticals without a prescription, long wait times to see a healthcare professional and a lack of trust in staff qualifications. Furthermore, despite significant investments in the healthcare sector in recent years, Russians continue to describe the quality of care as poor which most likely has a substantial impact on care-seeking behaviour.[38] Russians remain dissatisfied with healthcare services because of the long wait times, the limited availability of modern medical equipment and medications, as well as the availability and quality of medical personnel.[39]

METHODS

However, despite available evidence on problems faced by the healthcare system in the Russian Federation as a whole, there have been no systematic regional (ie, oblast-level) analyses of unmet need. To address this knowledge gap, the three objectives of this study include:

i. To document the prevalence of unmet need for healthcare at the regional (oblast) level for the period 2014–2018 by using an original data set collected by Rosstat;
ii. To analyse the relationship between unmet need and its main correlates at the subnational level, specifically the oblast level, including health supply side variables and variables that capture the socioeconomic status of inhabitants of different regions (oblasts) based on a panel fixed effects approach; and
iii. To examine the reasons given for experiencing unmet need for healthcare.

Data sets

We used data from two sources for this study. Data on unmet need for 2014, 2016 and 2018 were obtained from the survey entitled 'Results of a comprehensive observation on living conditions of the population' conducted by Rosstat that included information from 60 000 representative households in all regions (oblasts) of the Russian Federation. The results of this survey provide detailed information about the actual living conditions experienced by Russian families. Information was collected that focused on (1) housing and living conditions; (2) whether services tasked with providing education, healthcare, transport, trade and consumer services were meeting the needs of the population; (3) employment and working conditions; (4) social security and social protection; and (5) the use of free time. The survey is an effective representation of the Russian Federation at several distinct levels, including nationally (for the entire Russian Federation), subnationally (at the oblast level), by residence (rural vs urban) and by different sociodemographic groups.[40]

The unit of the survey was the household and its members. The sampling framework for the survey is based on the 2010 All-Russia Population Census.[40] The information on access to healthcare (and thus an unmet need for healthcare) is gathered for household members aged 15 years and above.[40] More specifically, the variable corresponds to a question in which the respondent was asked about occasions of not seeking care during the period between January and September of the respective year.[40] The collected data that was summarised at the oblast level that were available on the Rosstat website.

Based on the Rosstat data on the unmet need for healthcare, we assembled a retrospective panel data set for 83 regions (oblasts) for the 3 years mentioned above (ie, 2014, 2016 and 2018). The unmet need for healthcare represented the dependent variable in the model (as described further below). For the modelling analysis, we also employed several independent variables that, according to the existing literature, might help to explain the unmet need for healthcare at the oblast level over time. Data series from the regional Rosstat repository were also used as principal variables in the model on correlates of unmet need for healthcare in the Russian Federation.[41] The variables cover topics such as the level of economic development and the availability of healthcare infrastructure. Further details on the specific series are available in the online supplemental material. There is evidence from 2013 supporting the data quality

of official survey and census data. International sources have assessed the quality of official survey and census data in the Russian Federation.[42] These statistics have been previously used by international researchers[43 44] and various international organisations.[45 46]

Statistical analyses

Analysis of correlates of unmet need for healthcare

Based on the data summaries on unmet need provided by Rosstat, we generated an estimate of the link between the prevalence of unmet need and socioeconomic and healthcare system supply-side factors. We relied on panel fixed effects while also controlling for year effects.

Several specific reasons led to our choice of a panel fixed effects model. First, as mentioned above, the assembled data set is in panel form (ie, it encompasses observations from the same oblasts over time). Second, we assumed that there would be correlations between some of the independent variables and the time-invariant portion of the error term; this would render the ordinary least squares estimates inconsistent.[47] Thus, an assessment of panel fixed effects allows us to avoid any potential endogeneity while providing consistent estimates for other, potentially mildly endogenous time-dependent variables (eg, gross regional product (GRP) per capita). While most of the panel data studies take into account the possibility of reverse causality, we assume that the extent of unmet need itself will not have a significant impact on the factors under study. As our panel covers a comparatively short period (2014–2018), it is difficult to imagine that unmet need could lead to significant healthcare policy changes given the significant amount of time needed to generate major improvements in healthcare infrastructure and workforce. Furthermore, unmet need at the oblast level has not been documented until now. Therefore, policymakers are unlikely to be fully aware of the extent of this problem on a regional basis and thus will not have the information that they need to influence policy development. For these reasons, our choice of estimation method becomes clear.

We constructed a panel data set for 83 oblasts that includes information from the years 2014, 2016 and 2018 using the data obtained from the sources described above. We used the following equation to estimate the overall prevalence of unmet need:

$$Z_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Y_{it} + \epsilon_{it}$$

where the unmet need, Z_{it}, in oblast i at time t is a function of socioeconomic factors (X) and healthcare system supply factors (Y). We do not include spatial interdependence in the analysis, as our diagnostic test suggests that we cannot reject the null hypothesis of errors being independent and identically distributed (further details of the analysis are provided in the online supplemental materials).

The prevalence of unmet need was used as a main dependent variable in our fixed effects model. The independent variables include (1) socioeconomic variables and (2) healthcare system supply variables. The healthcare system supply variables include (1) the density of physicians, nurses and hospital beds per 10 000 persons and (2) healthcare expenditure as a share of GRP. As a robustness check, we also included healthcare expenditure per capita in real terms. The socioeconomic variables evaluated in this study include the level of regional economic development (proxied by GRP per capita adjusted for inflation), the population density (average number of persons per square kilometre), fraction of the population living in urban centres, the overall poverty rate (ie, the fraction of the population living below the national poverty line), the female to male ratio and the fraction of the population over the age of 75 years (ie, to account for the possibility of skew toward a more intensive need for healthcare). As a robustness check, we also included a variable that captured the share of the population over the age of 65 years. Variables were selected to capture the two most common barriers to accessing healthcare, namely, (1) the availability of healthcare services (proxied by healthcare supply variables); and (2) their affordability (proxied by poverty and regional level of economic development). It is important to note that while a lack of knowledge about when and how to obtain healthcare services might contribute to barriers to access, this concept is most commonly applied in assessments of low-income countries and are not directly relevant in the case of the Russian Federation. This is because of two principal reasons. First, given the level of health education in the Russian Federation, most individuals know when and how to seek healthcare services. In addition, given the vestiges of the previous system, most Russians are aware of the location of healthcare service providers. Thus, neither of these factors will likely pose a significant barrier to healthcare access. In addition, while cultural practices might also affect the decision to seek healthcare (and, thus, on overall unmet need), these typically do not vary over time and are thus not considered by our model. In other words, our analysis focused on the link between unmet need and variables that differ over time.

All analyses were performed with Stata V.14.

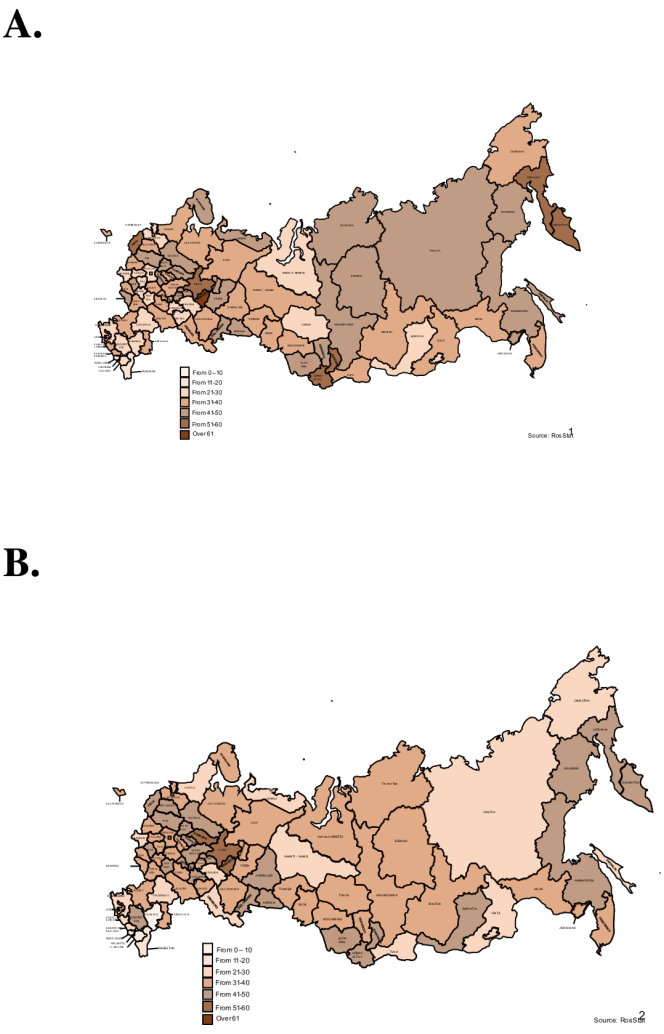
RESULTS

The information presented in table 1 depicts the average unmet need of the entire Russian Federation for the years 2014–2018. The unmet need for healthcare remains high; approximately one-third of the participants report

Table 1 Prevalence of the unmet need for healthcare in the Russian Federation (2014–2018)

Year	Unmet need for healthcare
2014	35.7
2016	33.02
2018	34.7

Source: Rosstat and the authors' calculations.



Source: Rosstat (2018) and the authors' calculations

Figure 1 Prevalence of the unmet need for healthcare in the Russian Federation. Shown are subnational (oblast) data from (A) 2014 to (B) 2018. Source: Rosstat (2018) and the authors' calculations.

that they were unable to receive healthcare when needed on at least one occasion during this period. The unmet need for healthcare dropped by 2.7 percentage points between 2014 and 2016, then rose by 1.7 percentage points between 2016 and 2018. Thus, the average small reduction observed between 2014 and 2018 was only 1 percentage point.

The findings presented in figure 1 represent the extent of unmet need for healthcare in the various regions (ie, oblasts) in 2014 and 2018. As shown, the regions with the highest levels of unmet need are scattered within the Volga, Siberia and the Far East. In 2018, the highest levels of unmet need for healthcare were reported in Udmurtskaya Respublica (Volga Federal District) at 62.3%, Respublica Altai (Siberia Federal District) at 55.4%, Kirovaskaya Oblast (Volga Federal District) at 55.1%, Kamchatskii Krai (Far East Federal District) at 54.8% and Respublica Khakasya (Siberia Federal District) at 52.1%. While there have been some changes in the overall reported unmet need across these oblasts over time, it is critical to recognise that these changes were comparatively minor in about half of them (39 of the 83). Furthermore, these minor changes (between −5 and +5 percentage points) effectively cancel each other out when considering the Russian Federation as a whole. Furthermore, while we detected double-digit increases in reported unmet need for healthcare in Ulyanovskaya Oblast and Respublica Mordoviya, these have been countered by double-digit reductions in the unmet need for healthcare reported in Respublica Kalmikya, Nenetskii Avtonomnii Okrug and Sakhalinskaya Oblast.

To examine the link between the extent of unmet need and its potential correlates, we performed a fixed effects analysis using the $\log_{10}$ of unmet need as the dependent variable. Table 2 provides a summary of the variables used in the modelling, and the results of the fixed effects model are presented in table 3. The correlation coefficients of the variables used in the modelling process are included in online supplemental appendix table A1.

Table 2 Descriptive statistics of the variables used in the fixed effects model

Variable	Number of observations	Mean	SD	Min	Max
Unmet need for healthcare (log)	249	3.5	0.3	1.4	4.1
Urban population (%)	249	70.4	13.1	29.2	100.0
Gross regional product (GRP) per capita (log)	249	11.2	0.7	9.8	14.0
Physicians per 10 000 persons	249	47.2	9.0	26.5	81.5
Hospital beds per 10 000 persons	249	87.6	14.9	44.4	152
Nurses per 10 000 persons	249	111.1	16.8	470.9	167.1
Poverty (%)	249	14.4	5.1	5.8	37.8
Health expenditures (% of GRP)	249	2.2	1.3	0.1	7.9
Real health expenditure per capita (log)	249	7.4	1.0	4.6	10.8
Females per 1000 males	249	1144.3	53.5	961.0	1233.0
Population over 65 years of age (%)	249	12.9	3.5	2.4	18.7
Population over 75 years of age (%)	249	5.9	1.9	0.6	8.8

Source: Rosstat and the authors' calculations.

Table 3 Panel fixed effects regression

Variable	Model 1	Model 2
Density of population per km^2	0.002* (0.001)	0.002† (0.001)
Urban population, %	0.025 (0.018)	0.014 (0.017)
GRP per capita, log$_{10}$	−0.395‡ (0.216)	−0.359 (0.224)
Poverty, %	0.013 (0.043)	0.013 (0.044)
Female to male ratio	0.002 (0.005)	0.003 (0.006)
Physicians per 10 000 persons	−0.006 (0.008)	−0.003 (0.008)
Hospital beds per 10 000 persons	0.009‡ (0.005)	0.009* (0.004)
Nurses per 10 000 persons	−0.002 (0.007)	−0.003 (0.007)
Health expenditures, % of GRP	0.037 (0.040)	
Health expenditures per capita in real terms, log$_{10}$		−0.009 (0.061)
Population over 75 years of age (%)	0.053 (0.050)	0.043 (0.048)
Intercept	1.87 (8.16)	0.98 (8.82)
R^2	0.13	0.13
Number of observations	249	249
Year effects (yes/no)	Yes	Yes
Number of groups	83	83

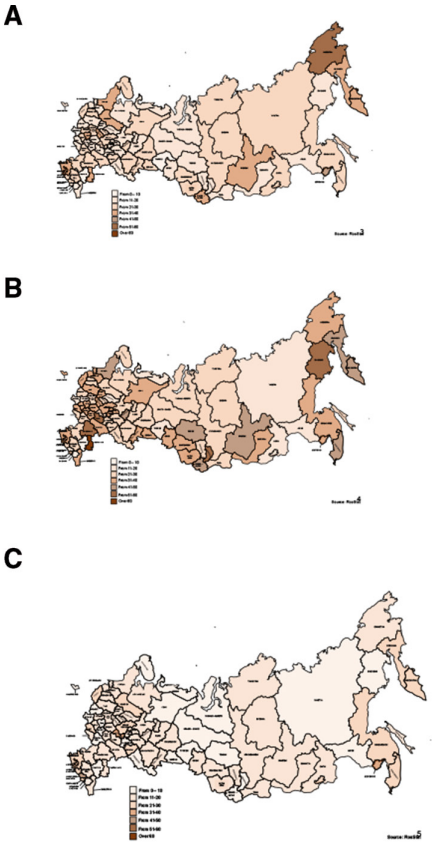
Log$_{10}$ of the unmet need for healthcare was used as a dependent variable for this analysis.
Source: Rosstat and the authors' calculations. In Model 1, health expenditure as a share of gross regional product (GRP) is used. In Model 2, we use a proxy for health expenditure—log of per capita healthcare expenditure in real terms.
The values reported here are parameter estimates from respective regression analyses. All models are estimated with robust SEs which are included in brackets.
*At 5%.
†Denotes significance at 1%.
‡At 10%.

Two principal findings resulted from this analysis. First, our results revealed a robust link between the level of economic development (captured by the log$_{10}$ of the GRP per capita) and unmet need. As shown, a 1% increase in the GRP per capita is associated with a 0.4% reduction in reported unmet need. Second, we also identified a robust and positive link between the density of hospital beds and perceived unmet need. Finally, while our findings also revealed a positive link between the overall population density and reported unmet need, the magnitude of the coefficient, in this case, is minuscule. In online supplemental table A2, we controlled for the share of population over the age of 65 and the results of this robustness check are consistent with the headline results.

The survey conducted in 2018 also asked respondents about the reasons why they experienced this unmet need. Because the respondents were permitted to select more than one possible reason for forgoing healthcare, the variables based on this question are not mutually exclusive. Thus, we have not evaluated these responses with a formal statistical analysis. Nevertheless, they provide a useful basis for further contextualisation of the results that emerged from the econometric analysis presented above. We used the three most-cited reasons for not using healthcare that emerged from this survey and mapped them across the various oblasts. We excluded reasons such as 'self-treatment' as this suggests that the health-related problem was not significant enough to warrant seeking healthcare. However, it is critical to recognise that 'self-treatment' was the reason that was provided most frequently (ie, by over half the respondents) for forgoing healthcare when needed. The results of this assessment are reported in figure 2. The reasons considered here include the perceived lack of effective treatments, lack of satisfaction with the quality of the healthcare organisation and financial reasons. Most respondents noted a lack of satisfaction with the quality of currently-available healthcare as the reason for not seeking healthcare; this was followed by a perceived lack of effective treatments and financial reasons. Lack of satisfaction with its quality as a reason for forgoing healthcare was particularly high in Astrakhanskaya Oblast, Penzenskaya Oblast, Volgogradskaya Oblast, Udmurtskaya Respublika and Respublika Khakasiya. Interestingly, all five of these regions are found in the bottom half when oblasts are ranked by GRP per capita. Consistent with this finding, 40% of respondents in Kabardino-Balkarskaya Respublika reported lack of money as the reason for forgoing healthcare. Of note, Kabardino-Balkarskaya Respublika is the second poorest oblast (after Respublika Ingushetia) in the Russian Federation.

DISCUSSION

To the best of our knowledge, this is the first study to examine the prevalence of unmet healthcare needs, the factors associated with unmet healthcare needs and the reasons for reporting such needs at a regional level in the Russian Federation.



Source: Rosstat (2018) and the authors' calculations

Figure 2 Reasons reported for the unmet need for healthcare in the Russian Federation. Unmet needs for healthcare at the regional level (by oblast) in 2018 due to (A) perceived lack of effective treatments, (B) lack of satisfaction with the work of the healthcare organisation or (C) financial reasons. Source: Rosstat (2018) and the authors' calculations.

The extent of unmet need at the regional (oblast) level is higher than previously anticipated. In addition, we identified significant variation across Russia's regions. The prevalence of unmet need was substantially higher in oblasts in the Volga, Siberia and Far East Federal Districts. The results of our empirical analysis revealed that the density of hospital beds and the extent of economic development were significantly correlated with the prevalence of unmet need on a regional basis. Moreover, dissatisfaction with healthcare services, perceived lack of effective treatments and financial constraints were identified as the main reasons for forgoing healthcare when needed. The latter result highlights problems with the quality of healthcare services covered by the standard OMI insurance.

We found that the unmet need for healthcare in the Russian Federation was approximately 30% with very little change from 2014 to 2018. This value is higher than the one previously reported for the Russian Federation by Nikoloski *et al*.[33] This may be because Nikoloski *et al*[33] relied on the RLMS; the question on unmet need focuses on forgoing medical care due to financial constraints only. Likewise, Nikoloski *et al*[33] define unmet need as forgoing healthcare due to financial reasons to avoid accruing any OOP healthcare expenditures. A cross-tabulation of RLMS questions focused on unmet need due to financial constraints yielded a prevalence of approximately 15% in 2018, which is comparable to the percentage of respondents forgoing healthcare due to financial problems in the survey used for this analysis. This value is slightly higher, although comparable, to that reported by the National Monitoring Public Health, which reported the prevalence of unmet need of 22.5% using a non-representative sample. The value reported here is also higher compared with the unmet need for healthcare measured by the EU-SILC surveys. This is to a large extent due to methodological differences. The EU-SILC survey reported that the main reasons for not seeking healthcare were confined to concerns regarding its expense, distances to travel and long wait times. By contrast, in the Rosstat survey, the most frequent reason for not seeking care was 'self-treatment', which was reported by more than half the respondents who reported unmet needs.[40 48]

The results of this analysis revealed that the density of hospital beds was positively associated with the prevalence of unmet need at the oblast level. This may be the result of a unique characteristic of the Russian healthcare system. The system is heavily oriented towards secondary healthcare, despite reforms directed at strengthening PHC that have been implemented since the mid-2010s. Medical school graduates also tend to select hospital-based specialties, even though the number of bed days per capita remains 70–75% higher in Russia than in any of the countries in the EU.[24] In addition, patients generally distrust PHC providers and believe that the care that they could receive superior care at a hospital. For example, a recent survey of patients revealed that 44% were dissatisfied with the length of visits in outpatient settings and 63% were unhappy with the qualifications of outpatient physicians. Similar estimates for other European countries revealed that 80–90% of respondents were satisfied with their general practitioners.[21] Thus, Russian patients tend to flock to 'last resort' resources, that is, emergency care and admission. This will lead to longer wait times and may result in patients forgoing healthcare.[49–51] However, the positive relationship between the hospital orientation of the healthcare system and the extent of experienced unmet need could be interpreted to mean that the heavy investment in healthcare infrastructure has not resulted in the needed quality improvements. This assertion is confirmed when one considers the reasons presented to explain unmet needs. Lack of effective treatments is the second most-cited reason for forgoing healthcare; this is reported most often in the oblasts with the highest number of hospital beds per capita, including Choktksii Avtonomnii Okrug, Evreyskaya Avtonomnaya Oblast and Kamchatka (all very remote regions, with low population density and small settlements with long distance between them).

The positive link between hospital density and unmet need is further reflected in the finding that the unmet need for healthcare is exacerbated in regions of high population density and thus captures the 'overcrowding' effect. More specifically, patients tend to seek healthcare in emergency rooms and hospitals, which have limited capacity, particularly in urban areas. This will lead to a higher unmet need for healthcare.

Finally, our findings indicate a negative relationship between the level of economic development (captured by GRP per capita) and the reported unmet need for healthcare. This is partly a reflection of the ability to pay. In other words, the poorer the region, the higher the probability that people in need will forgo healthcare because of financial constraints. As indicated by our results, in 2018, half of the 10 oblasts with the lowest GRPs per capita reported perceived unmet needs >40%. In addition, the oblasts with double-digit increases in the prevalence of unmet need between 2014 and 2018 are among the bottom third when ranked by GRP per capita. Moreover, many of these results were confirmed when respondents were asked directly whether lack of money was among the main reasons for not seeking healthcare when needed. As discussed above, 40% of the respondents from Kabardino-Balkarskaya Respublica, which is the second poorest oblast in the Russian Federation, reported a lack of money as a reason for foregoing healthcare. Some of these results might also reflect the nexus between the level of development and informal payments for healthcare which tend to be higher in poorer regions.[37 52–54]

There are some limitations associated with our research. First, we were constrained by the data available and thus the time period for analysing the extent of unmet need. Thus, our findings encompassed only three waves of data covering a period of 4 years. Second, while the main question on forgoing healthcare was unchanged throughout, the question that focuses on reasons for unmet need was only introduced in the final version of the survey. This effectively prohibited us from performing a time-dimension analysis on the perceived reasons underlying unmet need. Finally, the panel fixed effects model, while controlling for unobserved heterogeneity, cannot establish a causal link between the extent of perceived unmet need and its correlates.

Nevertheless, this study yields several distinct conclusions. First, our findings indicate that a significant portion of the general population in Russia refrained from seeking healthcare when necessary. Moreover, the data reveals minimal change in the prevalence of unmet healthcare needs between 2014 and 2018. Concerning regional disparities in unmet healthcare needs, we observed the highest rates in oblasts within the Volga, Siberia and Far East Federal Districts. Last, the empirical analysis underscores that economic development at the regional level, along with supply-side healthcare variables (such as the density of hospital beds), significantly correlate with reported unmet healthcare needs at the oblast level.

This study has several important implications for healthcare policy. First, efforts to de-emphasise the current heavy reliance on secondary healthcare might be coupled with investments in enhancing PHC might help to reduce the extent of unmet need at the regional/oblast level.[55] This might be accompanied by efforts to ameliorate some of the financial barriers affecting those seeking healthcare. The extent to which some or all of these challenges might be addressed given the current political climate remains to be seen.

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