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ABSTRACT

Urban shrinkage refers to a trajectory of development opposite to “normal” and desirable growth; depopulation is its distinct feature. Besides demographic shrinkage, economic shrinkage and shrinkage of public services indicate the settlements’ loss of urban characteristics and functions. The correlation between the dimensions of urban shrinkage is not linear, i.e. depopulation can justify services “optimisation” by policy-makers, but if the amount of services decreases below population needs it could foster further depopulation, thus creating a vicious circle. We focus on the interrelation of demographic and public services-related (healthcare) dimensions of urban shrinkage with evidence from *ca* 600 Russian cities, as well as on policies that engage with the above issues aiming to figure whether small and medium-cities are most vulnerable to such change.

KEYWORDS

Urban shrinkage, Shrinkage of services, Healthcare system, Healthcare reforms, Small and medium-sized cities, Russia

RÉSUMÉ

La décroissance urbaine désigne une trajectoire de développement opposée à la croissance « normale », le dépeuplement en est la caractéristique distinctive. Outre la décroissance démographique, le déclin économique et la décroissance des services publics indiquent la perte de fonctions urbaines par les villes. La corrélation entre les dimensions de la décroissance n’est pas linéaire, c’est-à-dire que le dépeuplement peut justifier une « optimisation » des services par les décideurs publics, mais si la quantité de services diminue en dessous des besoins de la population, cela pourrait favoriser un dépeuplement supplémentaire créant alors un cercle vicieux. Nous nous concentrons sur le lien entre la dimension démographique de la décroissance urbaine et celle liée aux services (par exemple, soins de santé) en se basant sur des données provenant d’environ 600 villes russes. Nous analyserons également les politiques qui traitent de ces questions, en cherchant à déterminer si les petites et moyennes villes sont plus sujettes à ces changements que les grandes villes.

MOTS CLÉS

décroissance urbaine, décroissance des services, services de santé, réformes des soins médicaux, petites et moyennes villes, Russie

1. INTRODUCTION AND STATE OF THE ART

Urban shrinkage refers to a trajectory of development, which is opposite to the “normal” and desirable growth. Long-term persisting depopulation is a rather distinct feature of urban shrinkage. However, the phenomenon may encompass other, interrelated dimensions. Along with demographic shrinkage, economic shrinkage and the shrinkage of public services (e.g. healthcare, education, social security, etc.) indicate the settlements’ loss of urban characteristics and functions.

The number of shrinking cities grows worldwide (e.g. Béal *et al.*, 2019). As the negative effects of urban shrinkage (abandonment, fragmentation of “urban fabric”, degrading infrastructures, declining tax revenues, among the most common) become evident, planners and policy-makers seek solutions for counteracting shrinkage or for mitigating its effects. But because of the predominant assumption that only rapidly growing cities are successful and attractive, planning approaches and tools have been long focused on promoting urban growth (Martinez-Fernandez *et al.*, 2012) and it is still not precisely clear how they should change when shrinkage is taking place even though the necessity of such changes seems obvious. Due to place specificity of urban shrinkage, the development of “one fits all” approach is a hard task. Thus, responses to urban shrinkage vary widely depending on the planning system, knowledge of planners and policy-makers, as well as on the

dominant discourses of desirable spatial development (Pallagst *et al.*, 2019). In relation to urban services, the literature describes several approaches aimed at planning for shrinkage. One of them is a “right-sizing” (LaFrombois *et al.*, 2019) which means among other elements bringing the urban services down to match the new population number. Another one is loosely referred to as “planned shrinkage” and implies a deliberate withdrawal of services due to general budget austerity and declining tax revenues (Reardon *et al.*, 2008). Against the above background, we analyse the relationship between demographic and services-related dimensions of urban shrinkage in Russia. The analysis is carried out on the example of healthcare system using the methodology developed within the project “Rétraction des services et commerces dans les villes petites et moyennes en France” (Baudet-Michel *et al.*, 2019). While the tendency of considerable transformation of the healthcare sector is a worldwide phenomenon (Currie & Spyridonidis, 2016), the domination of state regulation in the field of healthcare, as well as the hierarchical organisation of the latter (local –rural and urban–, regional and federal hospitals) make the case of Russian healthcare quite specific. Prior research conducted mostly based on examples from the Global North indicates that small cities are the ones vulnerable to urban shrinkage not only in terms of demographic (Martinez-Fernandez *et al.*, 2012) but also services-related aspects (Baudet-Michel *et al.*, 2019); we aim to figure out whether this tendency holds true for Russia.

2. URBAN SHRINKAGE IN RUSSIA

Russian demographic crisis began in the 1990s, a little after the collapse of state socialism, and was caused by a significant drop of fertility and a simultaneous sharp increase in mortality. Against the background of global reasons underlying depopulation, i.e. globalisation, post-Fordist deindustrialisation, and demographic transition, the negative population trends in Russia were predetermined by past historical events that transformed the population structure and were reinforced by the collapse of the politico-economic system. About 70% of the country's cities have lost population between 1989 (the year of the last Soviet population census) and 2019 both due to natural decline and out-migration; some at an average pace over 1% per year. Along with demographic shrinkage, Russia is facing a major reshaping of urban public services. In regard to the healthcare system, the overall number of hospital beds decreased from 2,037.6 thousand in 1991 to 1,182.7 thousand in 2017 (Rosstat). A specific feature of the health organisation and reformation in Russia is the duration and inconsistency of the policy implemented. During the post-Soviet period, healthcare underwent significant changes: from the liberalisation and regionalisation of management in the 1990s to the re-centralisation of regulation in the 2000s. Currently, despite the state's claims about its responsibility for financing, modernising amenities, and improving the quality of medical services, the key principle of healthcare regulation is the New Public Management. Optimisation of medical services, staff and beds is primarily based on the logic of economic profitability.

3. METHODOLOGICAL APPROACH

The research questions of the current study are as follows: (1) does the decrease in hospital beds number in Russia correspond to the population dynamics of the cities? (2) does the decrease in hospital beds number relate to the city size? (3) does the decrease in hospital beds number relate to the position of city within agglomeration? In other words, what units –core or peripheral– face a stronger decline in hospital services? In our analysis¹, we used publicly available data on hospital beds number and population in 1991-2013 for 574 municipal units with urban status in 46 regions of the European part of Russia, that were aggregated to 495 agglomerations according to Cottineau (2014). The data originated from the reports of the Russian State Statistics Service.

For the purpose of the analysis, we divided cities into:

- 4 groups according to their size (average for the study period): <20 thousand people, 20-50 thousand people, 50-200 thousand people, and >200 thousand people;
- 3 groups according to the mean annual population change: shrinking (<-0.1%), stable (-0.1%-0.1%), and growing (>0.1%);
- 3 groups according to the bed numbers change for the overall period: strong decrease (<=-50%), decrease (-50%-1%), and stable or growing (>-1%).

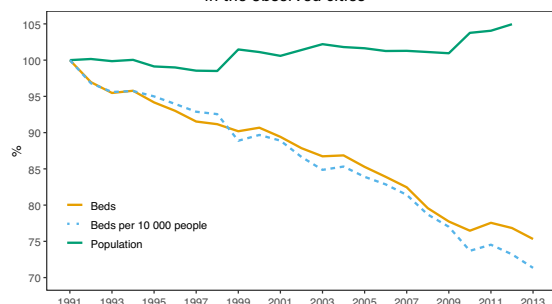
We also highlighted core (largest) and peripheral units of agglomerations; however, since the data was already aggregated by municipal units (not settlements), we identified only 34 cores and 71 peripheral units. The largest agglomerations in our dataset were Moscow (27 units) and Nizhny Novgorod (12 units).

¹ Here and after “urban agglomerations” and “cities” will be used as synonyms.

4. RESULTS

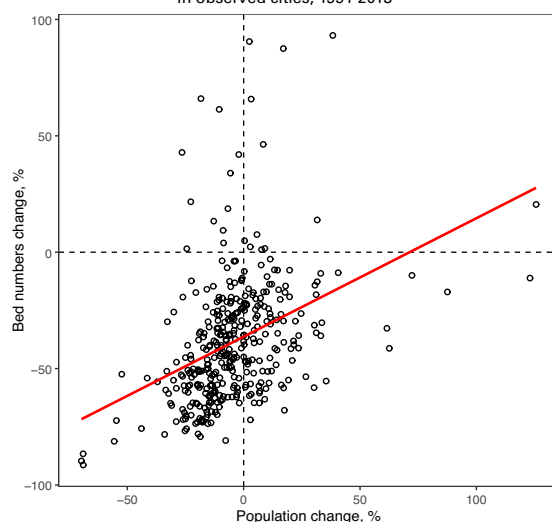
The overall population of the observed urban agglomerations grew from 62.6 million in 1991 to 65.7 million people in 2013. At the same time, the number of beds decreased from 923 thousand to 689 thousand, which means that the provision of health services in terms of number of beds per 10,000 people decreased by 29% (fig. 1).

Figure 1. Relative changes in population and bed numbers in the observed cities



in most cities, its intensity largely depended on population dynamics. 227 out of 495 cities suffered a strong (>50%) decrease in beds number; 182 (80%) of them were shrinking cities. With a few exceptions, the more city suffered depopulation, the more was a decline in beds number. This relationship is illustrated by figure 2.

Figure 2. Population change (%) vs. beds number change (%) in observed cities, 1991-2013



scaled, that allowed us to compare their effect sizes. The modelling results suggest that the decrease in beds number was largely following the decrease in population, even so the shrinkage of hospital care was over-represented in small cities.

The comparison of the beds number changes in central and peripheral units of agglomerations revealed that the shrinkage in hospital care was over-represented in the peripheral units. These results were confirmed with the exact Wilcoxon-Mann-Whitney Test: $U = 2.9995$, $p\text{-value} < 0.01$.

5. DISCUSSION

The aim of the current research was to analyse the patterns of demographic and services-related dimensions of urban shrinkage in Russia. To do so, we used official data on population and hospital beds dynamics in ca 600 cities during 1991-2013. The results of the study suggest that small cities with population below 50 thousand people are the most vulnerable to both dimensions of urban shrinkage in Russia. Population dynamics and changes in healthcare services seem to be interrelated: Small cities losing population are on average more prone to an acute decrease in hospital beds number. However, this interrelation does not mean straightforward causation.

We found that the beds number decrease occurs in both growing and shrinking cities which contradicts the idea of a "right-sizing" policy for shrinking cities but is indicative of a separate phenomenon presumably

Despite the overall growth, the population dynamics varied among cities of different size so that smaller cities tended to lose more people, while larger cities tended to grow. This redistribution of population resulted in a more polarised urban system: whereas in 1991, 11.5% of the urban residents lived in small cities, by the end of the period, in 2013, this share decreased to 9.8%, while the large cities (over 200 thousand people) accounted for 77% of urban population.

Although the decrease in beds number was observed

We also found a significant difference in the beds number changes among the cities of different size. The shrinkage in healthcare services was rather pronounced in small cities, which lost 57% (<20 thousand people cities) and 49% (20-50 thousand) of the initial hospital beds, while large (over 200 thousand) and medium-sized (50-200 thousand) cities lost only 18.5% and 38% of the hospital beds, respectively. However, since the smaller cities were losing population faster, it is difficult to distinguish the effect of the city size on the beds number from the effect of population dynamics. In order to do so, we modelled the beds number change (% , 1991-2013) as a function of average (for the study period) population size and population dynamics (% , 1991-2013). To avoid the random effects of regional differences, we built a linear mixed-effects model with the region as a grouping variable. The independent variables were

caused by the lack of material and social resources. Healthcare in Russia is becoming more and more spatially polarised. Our analysis showed that the decrease of beds number was over-represented in small and peripheral locations. While in large hospitals predominantly located in regional centres the range of services is broadening and technological aspects are being improved (Cook, 2017), in small cities access to medical facilities is being hampered. The population of small cities either has to refer to units providing a narrow range of services with no scope for choice, or travel long distances to reach alternative facilities. The decrease of healthcare services in small cities could well be one of the factors fostering depopulation both due to the rising mortality and amenities-related out-migration. However, further research is required to support this assumption.

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