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Global best practices in recruiting and retaining healthcare workers in rural areas (literature review)

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ABSTRACT

A significant issue for global healthcare is recruitment and retention of doctors and nurses, especially in rural areas. It threatens continuity and accessibility of medical care for a large segment of the population.

The aim of this article was to summarize currently available data on healthcare recruitment practices, particularly in rural areas, and key factors influencing retention of healthcare professionals. This will allow to develop evidence-based strategies for recruitment and retention of healthcare workers in the Russian Federation and reduce personnel shortage. International and Russian full-text articles were searched for in PubMed, ScienceDirect, Cochrane Library, Google Scholar, and eLibrary databases.

All the studied factors influencing recruitment and retention of healthcare professionals in rural areas were grouped into four main categories: financial, social, professional, and personal. Modern healthcare recruitment strategies were divided into three groups: financial, organizational, and instructional.

The review results suggest that the Russian Federation uses the majority of global strategies to recruit and retain healthcare professionals in rural areas. However, there are some activities that have not been adopted in our country. They may be included in healthcare management practices to increase the effectiveness of regional programs for development of human capital in healthcare.

Keywords: recruitment, retention, strategies, healthcare workers, rural areas, overview

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Мировые практики привлечения и удержания медицинских работников в сельских районах (обзор литературы)

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РЕЗЮМЕ

Привлечение и удержание врачей и среднего медицинского персонала, особенно для работы в сельских районах, является глобальной проблемой системы здравоохранения, ставящей под угрозу непрерывность и доступность оказания медицинской помощи значительной части населения.

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Целью данного исследования является обобщение имеющихся на сегодняшний день данных о практиках привлечения медицинского персонала, прежде всего в сельскую местность, и ключевых факторах, влияющих на удержание работников в сфере здравоохранения, что в будущем поможет разработать научно обоснованные мероприятия и подходы к привлечению и удержанию медицинского персонала и тем самым позволит сократить кадровый дефицит в системе здравоохранения Российской Федерации. Поиск отечественной и зарубежной литературы проведен в базах данных PubMed, Science Direct, Cochrane Library, Google Scholar, eLibrary.

Все изучаемые в настоящем исследовании факторы, влияющие на привлечение и удержание медицинских работников в сельской местности, объединены в четыре основные группы: финансовые, социальные, карьерные (профессиональные), личностные. Современные стратегии по привлечению персонала можно разделить на три направления: финансовые, организационные и образовательные.

Результаты обзора свидетельствуют, что в Российской Федерации реализуется большая часть мировых практик по привлечению и удержанию специалистов в сельских районах. Однако существуют мероприятия, которые не нашли своего применения в нашей стране. Данные практики могут стать дополнительными при формировании региональных программ по развитию кадрового потенциала здравоохранения, увеличивающие их эффективность.

Ключевые слова: привлечение, удержание, медицинские работники, сельские районы, стратегии, обзор

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов в связи с публикацией данной статьи.

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INTRODUCTION

Continuity and accessibility of medical care worldwide are threatened by a shortage of healthcare professionals in rural areas [1]. The World Health Organization (WHO) estimates a projected shortfall of 17 million health workers by 2030 [2]. The World Economic Forum estimates that by 2030, there will be a shortfall of 14.5 million healthcare professionals [3]. According to Rosstat data, there was a shortage of 24.7 thousand doctors and 127.1 thousand paramedical staff in the Russian Federation in 2021 [4]. Most researchers agree that causes of this may include problems in medical education, low social status of physicians, high workload, poor working conditions, and low salary [5]. Besides the absolute shortage of healthcare workers, uneven distribution of health professionals by specializations and geographical areas is registered [6, 7].

To solve this problem, strategies on recruiting and retaining health workforce are being developed and implemented around the world [8, 9]. Since motivation of healthcare professionals is influenced by a complex of interrelated factors, a well-chosen combination of various measures is required for their effective recruitment and retention [10].

The aim of this article was to summarize currently available data on healthcare recruitment practices, particularly in rural areas, and study the key factors influencing retention of healthcare professionals. This will allow to develop evidence-based strategies for recruitment and retention of healthcare workers in the Russian Federation and reduce personnel shortage in the future.

The PubMed, ScienceDirect, Cochrane Library, Google Scholar, and eLibrary databases were used to search for publications. The following keywords were used: “attract”, “recruitment”, “retention”, “health workers” etc. We considered articles published in 2015–2022. Several issues required a more detailed data analysis. A total of 3,890 sources were analyzed, from which 540 studies with representative samples were chosen. The final version of the review included 65 articles on strategies to recruit and retain medical workers.

FEATURES OF RECRUITMENT AND RETENTION OF HEALTHCARE PROFESSIONALS IN RURAL AREAS

The decision of specialists to stay in or leave rural areas is complex and influenced by a variety of factors [11]. Based on the examination of published studies, all factors can be divided into four categories.

Financial factors include salary, training reimbursement, benefits, and allowances. In most studies, salary was one of the key incentives for specialists to work in rural medical facilities. According to J. Witt et al. (2017, *n* = 2, 478, Canada), salary, working hours, and frequency of home visits were the most important factors in considering a place of work [12]. N. Nurelhuda et al. (2018, *n* = 455) showed that medical students thought that regional healthcare should provide them with a scholarship throughout their studies [13]. In a similar study in Indonesia (2016, *n* = 400), F. Efendi et al. (2016) obtained comparable data and revealed the importance of modern, high-quality equipment [14]. Based on the findings of S.C. Okoroafor et al. (2021, *n* = 198, Nigeria), higher salary increased the probability of working in rural areas by 2.7 times, while accommodation or housing allowances increased the odds by 4 times [15].

Following the outcomes of an in-depth interview by L. Berman et al. (2021), Malaysian doctors (*n* = 472) would be 6.67 times more likely to prefer a rural career if incomes were raised by 50% (95% confidence interval (CI): 5.66–8.08). [16]. V.A. Smiianov et al. (2017, *n* = 167) found that most doctors would agree to an increase in workload for an additional fee, but they were unlikely to change their place of work for a higher-paying job [17]. O.A. Doshchannikova (2020, *n* = 561) discovered that 16.8 ± 1.6% of doctors decided to leave the rural are after the end of the Socioeconomic Support Program. "Low salary" (39.3 ± 2.1%) and "family circumstances" (21.3 ± 1.73%) were the most common explanations [18]. A survey of 259 doctors and 215 medical students in Zambia by M.L. Prust et al. (2021) found that participants would prefer to work in hard-to-reach areas if they were offered accommodation in rural areas (odds ratio (OR) = 5.04, 95% CI: 4.12–6.18), accommodation in the city (OR = 2.21, 95% CI: 1.86–2.62), or an allowance after four years of work in a rural medical facility (95% CI: 1.69–2.33) [19].

Social factors include living and working conditions. According to the survey of nurses carried out in Australia by M. Prengaman et al. (2017), availability of materials and equipment for work had the greatest effect on recruitment and retention of nurses in rural areas [20]. S.C. Okoroafor et al. (2022, Nigeria, *n* = 145) revealed that availability of school education for children increased the chances of working in rural areas by 6.17 times, provision of accommodation – by 14.6 times, and improvement of living and working conditions – by 14.4 times [21]. The key factors in the study by U. Lawan et al. (2017, *n* = 262, Nigeria) were infrastructure and equipment (92.3%), improvement of living conditions (91.2%), availability of clean water and electricity (91.5%), and schools for children (91.5%) [22]. According to S.B. Boadi-Kusi et al. (2018, *n* = 333, Nigeria), improved living conditions were major factors for 71.2% of respondents in their decision to move to rural areas [23].

The study by L. Berman et al. (2021) showed that accommodation, the quality of the working environment, and workload were the most important factors in choosing a place of work. Respondents also were 2.04 times more likely to select a job in rural areas with better living conditions (95% CI: 1.71–2.44) and 1.7 times more likely to choose a job with a better workspace environment (95% CI: 1.47–1.96) [16].

Professional factors include continuing education opportunities, scientific and educational activities, professional development at the expense of the employer, career growth, and professional community support [24–26]. V.A.T. Nguyen et al. (2020, 2021, *n* = 167) [25, 26] demonstrated the significance of these factors in Vietnam**.** In a survey by S. Mollahalilolu et al. (201, *n* = 1,340), rural health professionals said that remote location of a medical facility hindered development of their professional skills [27]. Career growth was essential to 71.3% of participants in the research by S.B. Boadi-Kusi et al. (2018) [23]. According to O.A. Doshannikova (2020), 19.7 ± 1.68% of doctors would leave the rural area due to "a lack of career growth and professional advancement opportunities" [18]. G.Yu. Okuneva et al. (2021) found that 35.9% of senior medical students (*n* = 280) did not want to work in rural regions due to a lack of professional development and career growth [28].

However, C. Morken et al. (2018, *n* = 16) showed that professional advancement opportunities had no significant influence on retention of medical workers in rural areas [29]. According to S.C. Okoroafor et al. (2021,) Doctors and Candidates of Sciences were 4% less likely to work in remote regions [15].

Personal factors include demographic information (age, gender), education level, marital status, place of birth, and place of residence.

According to the findings of an Israeli study (n = 6,673), rural healthcare workers were 17 times more likely to stay in the rural area for work (95% CI: 6.8–43.8), while those without work experience in remote areas were 28% less likely to continue working in rural areas (95% CI: 0.66–0.92). Furthermore, women were significantly less likely to choose jobs in rural areas than men (OR = 0.66, 95% CI: 0.56–0.78) [30].

According to the survey of 184 students from West Africa by C.S. Sidibé et al. (2019), a place of residence (p = 0.003) and location of an educational organization in rural areas (p = 0.03) are associated with a stronger inclination to stay and work there [31]. L. Berman et al. (2021) discovered that students who had previously lived in rural regions (OR = 3.4, 95% CI: 1.71–6.79) and those who had an employer-sponsored training agreement were significantly more likely to say that they would continue working there (OR = 3.66, 95%CI: 2.22–6.04) [16]. M.L. Prust et al. (2021) confirmed the importance of having work experience in rural regions when choosing a place of work [19].

Marital status is another significant factor in making a decision to work in rural areas [32–34]. When personal files of 30,569 Iranian family medicine doctors were examined, it was found that the marital status was a significant predictor of choosing a job in the rural area (OR = 1.34, 95% CI: 1.25–1.43) [33]. Furthermore, S.C. Okoroafor et al. (2021) discovered that practitioners with children were 6 times more likely to work in rural medical facilities [15].

Table

Factors influencing recruitment and retention of healthcare professionals

Author	Year	n*	Country	Factors influencing recruitment and retention of healthcare workers
Witt et al.	2017	2,487	Canada	Salary, working hours, and the frequency of doctor's home visits
Nurelhuda et al.	2018	455	Sudan	Providing scholarships during the study period, improving the equipment of medical organization
Okoroafor et al.	2021	198	USA	Accommodation, bonuses, improved working conditions
Berman et al.	2021	472	South Africa	Accommodation, workload, working conditions, career growth, living in a rural area
Efendi et al.	2016	400	Indonesia	Education scholarships, salary, working conditions, modern equipment
Ashkenazi et al.	2019	736	Israel	Working conditions, professional advancement, partner's employment, parents' living in the rural area
Nguyen et al.	2020	167	Vietnam	Continuing medical education, advanced training, parents' living in the rural area
Prengaman et al.	2017	16	Australia	Support from the professional community, availability of necessary resources and equipment
Morken et al.	2018	16	USA	Job satisfaction, work – life balance, support from family and professional community
Taati Keley et al.	2016	6,673	Iran	Male gender, living in the village, practical training and work experience
Boonluksiri et al.	2018	10,018	Thailand	Rural location of an educational institution
Ehsani-Chimeh et al.	2018	30,569	Iran	Salary, marital status, developed infrastructure
Flores et al.	2021	102	Philippines	Working conditions, marital status, professional advancement, salary, accommodation
Prust et al.	2019	474	Zambia	Work experience in rural areas, improvement of living conditions / provision of accommodation, scholarships
Sidibé et al.	2019	186	West Africa	Living in a village, location of an higher education institution in the rural area
Mollahaliloðlu et al.	2015	1,340	Turkey	Career advancement and professional development opportunities
Okoroafor et al.	2022	145	Nigeria	Working and living conditions, availability of high-quality school education in rural areas
Lawan et al.	2017	261	Nigeria	Developed infrastructure, available drinking water and electricity, schools for children
Boadi-Kusi et al.	2018	337	Gana	Financial incentives, improvement of living conditions, career growth
Doshchennikova O.A. et al.	2020	561	Russia	Salary, career and professional growth, family ties, living conditions
Okuneva G.Yu. et al.	2021	280	Russia	Financial incentives, accommodation, rural lifestyle, opportunities for professional and career development, improved working conditions

* number of participants

Best practices in recruiting and retaining healthcare professionals in rural areas

Based on the analysis of publications, all strategies may be grouped into three broad categories: financial, organizational, and educational.

Financial strategies to recruit and retain healthcare professionals

There are three ways to use financial measures to recruit and retain healthcare workers. The first way is a long-term monthly bonus in the form of a fixed

salary increment. In India, for example, such a system was implemented: by 2011, 1,319 specialists had been employed, and the number of vacant positions in medical organizations decreased from 90 to 45% [35]. In Bangladesh, financial benefits in the amount of 33% of the base salary rate, but no more than $ 38 per month, are given to physicians working in rural areas [36]. Tanzania pays daily allowances and subsidizes housing, and measures are taken to accommodate physicians arriving in sparsely populated areas in houses of other medical practitioners before the former rent accommodation [37].

The second type of financial measures is a scholarship for students who want to pursue specialized training. According to Z. Marsh et al. (2019), more than 220 nurses were recruited in the United Kingdom within three years after the program implementation [38]. There is also a one-time payment option available, with a minor pay rise. In China, a program was implemented that takes into consideration work experience in rural areas: with work experience of more than 5 years, a bonus of 50–200 thousand yuan is paid; graduates of medical schools who have worked in rural areas for more than 1 year receive a bonus of 10–30 thousand yuan. Since the program implementation, the proportion of healthcare professionals who are willing to work in rural areas has increased from 1.09% in 2013 to 6.49% in 2016 [39].

Organizational strategies for recruiting and retaining healthcare workers

According to the findings of the study, financial benefits were secondary and less effective than non-financial factors [29]. According to C. Marchand et al. (2017), strategies focused on professional recognition and job satisfaction are more significant than financial ones [40]. L. Tudor Car et al. (2021) obtained similar results in their research [41]. According to N. Sirili et al. (2018), developing individual plans for professional and career growth is effective in retaining practitioners in rural medical facilities [37]. Mentorship programs also have a significant influence on retention of healthcare professionals in remote areas. According to D.M. Gumede et al. (2021), implementation of mentorship programs in 2002 enabled to recruit more than 300 doctors to work in hard-to-reach areas of the Republic of South Africa [42].

According to R. Schaefer et al. (2021), implementation of a flexible work schedule and an opportunity of part-time employment for doctors and paramedical staff allowed to retain the most efficient workers, prevent professional burnout, and guarantee stability and continuity of work [43]. A similar strategy was successfully implemented in Australia: according to the findings of the research by V.P. Weale et al. (2017, $n = 108$), it allowed to improve job satisfaction and maintain a work – life balance [44]. Professional development opportunities in medical organizations had a substantial effect on job satisfaction in the study conducted by A. Honda et al. (2015, Mozambique) [45].

Educational strategies for recruiting and retaining healthcare professionals

It is essential to meet the need of healthcare workers for training and education throughout their careers. In the project described by R. Shah et al. (2021), 611 healthcare workers were distributed to five hard-to-reach areas of Guinea in 2017. Of them, 18% of workers were going to leave after 12 months; with the remaining employees, semi-structured interviews were conducted, showing that continuing education opportunities motivated doctors to work in hard-to-reach areas [46].

The Republic of South Africa implemented an educational program for physicians at rural medical organizations (decentralized), which is focused on physicians' needs. By 2020, nine participants had graduated and were still working in hard-to-reach areas [47]. Since 2007, a training course for rural students at rural medical colleges has been established in Wisconsin, USA: 51% of students continue to work in rural areas [48]. Such educational programs have been used effectively in Canada, Australia, the Philippines, the Republic of South Africa, Mali, Thailand, and other countries [49–51].

T. Woolley et al. (2018, $n = 283$) revealed that 31% of graduates of socially responsible medical education institutions based at rural medical facilities continue working in remote areas, compared to 7% of graduates of ordinary higher education institutions ($p < 0.001$) [52]. A study conducted by M.R. McGrail et al. (2016, $n = 610$) in Austria discovered a significant correlation between respondents' birth and education in a rural area and their choice of a successive place of work: 74–91% of respondents with a rural place of birth and 87–95% of those educated in rural areas managed to remain in that area for the first five years after accreditation, whereas this effect was amplified when combined with a rural place of birth (OR 24; 95% CI: 13–43) [53]. In the study by P. Boonluksiri

et al. (2018) that included 10, 018 physicians, 21% of whom lived in the rural area, 5, 774 persons (57.6%) decided to work in rural medical organizations; those who completed a similar program in Thailand were considerably more likely to stay in rural regions compared to other peers (62.3% and 49.0%, $p < 0.001$) [54].

Since 2014, a model of early application and priority enrollment in residency based at rural medical facilities has been implemented in Norway. According to M. Gaski et al. (2018, $n = 388$), the proportion of graduates who applied for a residency program ahead of time and decided to work in remote areas (29%) was twice as big as the percentage of other respondents (15%) [55].

BEST PRACTICES IN RECRUITING AND RETAINING HEALTHCARE WORKERS IN RURAL AREAS IN THE RUSSIAN FEDERATION

Most of the described strategies are successfully implemented in the Russian Federation. The program Zemsky Doctor (Rural Doctor) has been implemented since 2012, while Zemsky Feldsher (Rural Paramedic) has been implemented since 2015. Medical workers (doctors, paramedics) who arrive in a rural area, an urban-type settlement, or a small town with the population of up to 50 thousand people receive a one-time payment of up to two million rubles[1]. According to V.M. Chernysheva et al. (2022), the implementation of the Zemsky Doctor and Zemsky Feldsher programs in the Siberian Federal District did not lead to an increase in staffing. From 2016 to 2020, availability of physicians decreased from 15.1 to 13.5 (per 10,000 population), and availability of paramedical personnel reduced from 59.1 to 54.2 (per 10,000 population). The comparison of participation in the program with staffing was the study limitation; the number of workers who left the profession was not taken into consideration [56].

According to D.A. Bugaev et al. (2019), the largest number of agreements within the Zemsky Doctor program were signed in the Stavropol Krai in 2012 ($n = 259$), and the smallest – in 2016 ($n = 70$) [57]. According to the study by V.V. Zubkov et al. (2019), during the program implementation (2012–2017), the shortage of physicians in the rural areas of the Khabarovsk Krai decreased by 30%, and 202 doctors were recruited in medical facilities in all districts of the region [58]. According to M.V. Kinchagulova (2018), the total number of physicians in rural areas of the Tyumen Oblast increased by 30.2% (844 persons) in 201–2021 as a result of the program implementation [59]. According to the findings of A.V. Danilova (2018), 466 medical practitioners moved to rural areas of the Voronezh Oblast from 2012 to 2017, 74 people moved to work settlements, and 23 – to urban-type settlements [60]. From 2012 to 2021, 52,000 healthcare workers were involved in the program implementation. Approximately 6,000 workers were recruited in 2021 due to one-time payments.

Other types of support are also being implemented in a number of Russian regions. Since 2013, the Leningrad Oblast has been offering financial benefits in the form of annual payments totaling 120 thousand rubles. In 2017, 530 people received such benefits among hospital specialists, such as anesthesiologists, resuscitators, neonatologists, psychiatrists, psychotherapists, and phthisiologists [61]. Physicians in the Kaliningrad Oblast receive a one-time payment in the amount of 300 to 900 thousand rubles[1] after their first employment in a government-funded medical organization. Specialists who live in rural areas are reimbursed for accommodation and utility bills and are offered mortgage assistance programs and partial rent coverage in Leningrad, Pskov, Murmansk, Novgorod, Vladimir, Orenburg, Voronezh, and a number of other regions [60, 62, 63]. According to O.A. Doshchannikova et al. (2018), the program aimed at supporting young professionals in rural areas helped to recruit more than 1,200 doctors in the Nizhny Novgorod Oblast between 2006 and 2017 [64].

In the Khanty-Mansiysk Autonomous Okrug – Yugra, measures of social support for people who arrived from other Russian regions and signed employment contracts include coverage of relocation costs for workers and their family members within the territory of the Russian Federation; paid vacation of seven calendar days for relocation; a one-time payment in the amount of two official salaries and an allowance

[1] Resolution of the Government of the Russian Federation (2022) On Amendments to Appendix 5 to the State Program of the Russian Federation "Development of Healthcare" No.739 of 22.04.2022.

[2] Resolution of the Government of the Russian Federation (2014) On establishing the order of providing social support measures for certain groups of individuals, who completed training programs in government-funded organizations specializing in post-graduate and residency programs No. 520 of 15.08.2014

for each family member; and reimbursement of rental costs for invited professionals in the range of 50 to 100% of the cost[1]. Furthermore, graduates of secondary and higher technical education institutions under the age of 30 who have signed an employment contract with a medical organization are entitled to a one-time payment in the amount of up to two monthly salaries.

Since 2017, the Orenburg Oblast has been using mentorship strategies to improve the level of skills of young experts throughout their first 12–24 months of employment. This approach involved 65 medical organizations, 1,470 young experts, and 740 mentors in 2017–2019.[2]

Similar strategies are implemented in the Ulyanovsk Oblast. Since 2013, over 2,000 healthcare workers have participated in the mentorship program, and the number of employed graduates climbed from 64 to 83% in 2016–2018[3].

Another important strategy implemented in the Russian Federation to recruit and retain young professionals is a stimulating monthly payment throughout the study in medical universities after signing an employer-sponsored training agreement. In the Sakhalin Oblast, for example, students are provided with coverage of extracurricular paid educational services, reimbursement of rental costs for accommodation throughout the study period, coverage of traveling costs to the place of internship and practical training in residency, and an additional payment throughout this period[4].

CONCLUSION

According to our review, there are several factors that influence the decision of healthcare professionals about rural practice, as well as their recruitment and retention in the rural area. All of the factors examined in this research are grouped into four categories: financial, social, professional, and personal. At the same time, these factors have different significance for various types of professionals. The most frequently described factors in the literature were financial ones: salary, scholarships and allowances throughout the training period, which were significant for young professionals. Personal factors, such as rural background, as well as education and practical training in rural areas, are of special interest. Numerous studies have demonstrated their relationship with retention and willingness to work in hard-to-reach areas. At the same time, more research is required to comprehend the characteristics of a future rural physician, including rural background, gender, character traits, and other factors, which will serve as the basis for selection and recruitment policy and pre-enrollment counseling for school leavers and senior high school students.

Currently, several strategies have been implemented to solve the problem of recruiting and retaining practitioners in rural areas – often a combination of various methods has been employed. The choice of specific measures should be based on a profound understanding of the characteristics of human resources in healthcare, which requires a comprehensive analysis of the labor market, staff distribution by the geographical area, and factors influencing the decision to stay in or leave rural areas.

According to the findings of the study, current methods may be divided into three types: financial, organizational, and educational. Based on the research results, the first, most effective, cost-effective, and affordable group of strategies includes educational measures. Based on international best practices, educational measures include practical training in rural areas to familiarize students with the specifics of work in rural medical facilities; decentralized training at rural medical facilities; work with school leavers living in rural areas as part of an admission campaign; placement of medical colleges and universities in rural areas; and development of career advancement programs that meet the needs of rural healthcare professionals.

The second set of measures includes financial benefits, such as scholarships for students who study in the employer-sponsored program, one-time payments for rural workers, and an increased salary coefficient. It is important for professionals to be able to choose

[1] Order of Healthcare Department of the Khanty-Mansiysk Autonomous Okrug – Yugra (2015) On approving draft Provisions on establishing remuneration for healthcare workers in medical facilities subordinate to the Healthcare Department of the Khanty-Mansiysk Autonomous Okrug – Yugra No. 13-np of 29.10.2015

[2] Resolution of the Ministry of Health of the Orenburg Oblast (2017) On approving provisions on mentorship programs in government-funded medical facilities No. 1949 of 07.09.2017

[3] Resolution of the Government of the Russian Federation (2019) On approving Provisions on mentorship in civil service in the Russian Federation No. 1296 of 07.10.2019

[4] Passport of the regional project "Staffing of medical facilities with highly qualified professionals (Sakhalin Oblast)"

one of the previously mentioned financial incentive strategies.

The third group includes organizational measures, such as an increase in job satisfaction due to improved working conditions in rural areas, flexible work schedules, improved living conditions (raising the physician's social status), opportunities for career growth, and creation of horizontal communications between urban and rural medical organizations.

Although current methods recognize multiple and interrelated effects of various factors, they are often challenging and do not allow for development of strategic actions. Furthermore, there is no assessment of the effectiveness of implemented measures in most countries, which hinders their distribution and transfer. Monitoring and assessing the implemented best practices are necessary to detect implementation restrictions, change policies if needed, learn important lessons, collect evidence, and deepen the understanding of how and why certain measures work in some circumstances but are ineffective in others. As a result, monitoring and assessment should be included into the implementation plan.

According to the findings of this review, the Russian Federation uses most of the global best practices for recruiting and retaining healthcare professionals in rural areas. However, some measures have yet to be implemented in our country, such as development of individual professional and career growth plans for respondents who are Doctors and Candidates of Sciences, integration of flexible work schedules for physicians of rare specialties, training at rural medical organizations, including decentralized training, and development and implementation of residency programs at rural medical organizations with field accreditation.

These best practices may be included in healthcare management practices to increase the effectiveness of regional programs for development of human capital in healthcare.

REFERENCES

1. Obamiro K.O., Tesfaye W.H., Barnett T. Strategies to increase the pharmacist workforce in rural and remote Australia: a scoping review. *Rural Remote Health*. 2020;20(4):5741. DOI: 10.22605/RRH5741.
2. WHO. 2016. Global Strategy on Human Resources for Health: Workforce 2030. Geneva, Switzerland.
3. Investment with social returns. – Kommersant newspaper No. 93 (7294) of 30.05.2022 (in Russ.). URL: https://www.kommersant.ru/doc/5379613
4. Federal State Statistics Service (in Russ.). URL: https://rosstat.gov.ru5
5. Marchand C., Peckham S. Addressing the crisis of GP recruitment and retention: a systematic review. *Br. J. Gen. Pract.* 2017;67(657):e227–237. DOI: 10.3399/bjgp17X689929.
6. Nguyen V.A.T., Könings K.D., Wright E.P., Luu H.N., Scherpbier A.J.J.A., van Merriënboer J.J.G. Working in preventive medicine or not? Flawed perceptions decrease chance of retaining students for the profession. *Hum. Resour. Health*. 2019;17(1):31. DOI: 10.1186/s12960-019-0368-2.
7. Hu Y., Xu J., Dong W., Yuan Z., Sun X. Strategies to correct the shortage of paediatricians in China. *Lancet Lond. Engl*. 2018;392(10145):385. DOI: 10.1016/S0140-6736(18)31192-9.
8. Chotchoungchatchai S., Marshall A.I., Witthayapipopsakul W., Panichkriangkrai W., Patcharanarumol W., Tangcharoensathien V. Primary health care and sustainable development goals. *Bull. World Health Organ*. 2020;98(11):792–800. DOI: 10.2471/BLT.19.245613.
9. Danish A., Champagne F., Blais R. Theoretical analysis of policies to improve the recruitment and retention of rural physicians. *Aust. J. Rural Health*. 2020;28(5):427–433. DOI: 10.1111/ajr.12666.
10. Buchan J., Couper I.D., Tangcharoensathien V., Thepannya K., Jaskiewicz W., Perfilieva G. Early implementation of WHO recommendations for the retention of health workers in remote and rural areas. *Bull. World Health Organ*. 2013;91(11):834–840. DOI: 10.2471/BLT.13.119008.
11. Malatzky C., Cosgrave C., Gillespie J. The utility of conceptualisations of place and belonging in workforce retention: A proposal for future rural health research. *Health Place*. 2020;62:102279. DOI: 10.1016/j.healthplace.2019.102279.
12. Witt J. Physician recruitment and retention in Manitoba: results from a survey of physicians' preferences for rural jobs. *Can. J. Rural Med.* 2017;22(2):43–53.
13. Nurelhuda N., Bashir A., ElKogali S., Mustafa M., Kruk M., Aziz M.A. Encouraging junior doctors to work in rural Sudan: a discrete choice experiment. *East. Mediterr. Health J.* 2018;24(9):838–845. DOI: 10.26719/2018.24.9.838.
14. Efendi F., Chen C.M., Nursalam N., Andriyani N.W.F., Kurniati A., Nancarrow S.A. How to attract health students to remote areas in Indonesia: a discrete choice experiment. *Int. J. Health Plann. Manage*. 2016;31(4):430–445. DOI: 10.1002/hpm.2289.
15. Okoroafor S.C., Ongom M., Salihu D., Mohammed B., Ahmat A., Osubor M. et al. Retention and motivation of health workers in remote and rural areas in Cross River State, Nigeria: a discrete choice experiment. *J. Public Health Oxf. Engl.* 2021;43(1):i46–53. DOI: 10.1093/pubmed/fdaa236.
16. Berman L., Nkhoma L., Prust M., McKay C., Teshome M., Banda D. et al. Analysis of policy interventions to attract and retain nurse midwives in rural areas of Malawi: A discrete choice experiment. *PloS One*. 2021;16(6):e0253518. DOI: 10.1371/journal.pone.0253518.

17. Smijanov V.A., Smijanova O.I., Gruzieva T.S., Vygovskaja L, Rudenko L.A. Study of motivations of doctors in relation to improving the quality of medical care. *Wiadomosci Lekarskie.* 2017;70(1):27–31 (in Russ.).
18. Doshchannikova O.A., Pozdeeva T.V., Filippov Ju. N. Social portrait of a modern rural doctor – realities and prospects. *Social Aspects of Population Health*. 2020;66(1):7 (in Russ.). DOI: 10.21045/2071-5021-2020-66-1-7.
19. Prust M.L., Kamanga A., Ngosa L., McKay C., Muzongwe C.M., Mukubani M.T. et al. Assessment of interventions to attract and retain health workers in rural Zambia: a discrete choice experiment. *Hum. Resour. Health.* 2019;17(1):26. DOI: 10.1186/s12960-019-0359-3.
20. Prengaman M., Terry D.R., Schmitz D., Baker E. The nursing community apgar questionnaire in rural Australia: An evidence based approach to recruiting and retaining nurses. *Online J. Rural Nurs. Health Care*. 2017;17(2): 148–171.
21. Okoroafor S.C., Osubor M.K., Nwachukwu C. Factors influencing attraction and retention of frontline health workers in remote and rural areas in Nigeria: a discrete choice experiment. *J. Public Health Policy*. 2022;43(3):347–359. DOI: 10.1057/s41271-022-00351-z.
22. Lawan U., Amole G., Khayi J. Rural posting experience, requests for transfer, and perspectives about critical factors for staff retention among primary health care workers in urban Kano, Nigeria. *Niger. J. Clin. Pract.* 2017;20(1):25. DOI: 10.4103/1119-3077.178946.
23. Boadi-Kusi S.B., Kyei S., Okyere V.B., Abu S.L. Factors influencing the decision of GHANAIAN optometry students to practice in rural areas after graduation. *BMC Med. Educ*. 2018;18(1):188. DOI: 10.1186/s12909-018-1302-3.
24. Ashkenazi Y., Gordon M., Rosen B. Using financial incentives to attract medical residents to the periphery: The Israeli experience. *Health Policy Amst. Neth*. 2019;123(1):80–86. DOI: 10.1016/j.healthpol.2018.10.006.
25. Nguyen V.A.T., Könings K.D., Wright E.P., Kim G.B., Luu H.N., Scherpbier A.J.J.A. et al. Why do graduates choose to work in a less attractive specialty? A cross-sectional study on the role of personal values and expectations. *Hum. Resour. Health*. 2020;18(1):32. DOI: 10.1186/s12960-020-00474-y.
26. Thi Nguyen V.A., Könings K.D., Scherpbier A.J.J.A, van Merriënboer J.J.G. Attracting and retaining physicians in less attractive specialties: the role of continuing medical education. *Hum. Resour. Health*. 2021;19(1):69. DOI: 10.1186/s12960-021-00613-z.
27. Mollahaliloðlu S., Uðurluoðlu Ö., Iþýk O., Kosdak M., Taþkaya S. Factors affecting the work of physicians in rural areas of Turkey. *Rural Remote Health*. 2015;15(3):3048.
28. Okuneva G.Ju., Lusevich E.S., Shcherbakova A.I. The opinion of medical students about employment in rural areas and the program "Zemsky doctor". Topical Issues of Public Health and Healthcare at the Regional Level: Proceedings of Russian Scientific and Practical Con- ference (with International Participation).. Irkutsk: Irkutsk Research Center for Surgery and Traumatology, 2021:127–132 (in Russ.).
29. Morken C., Bruksch-Meck K., Crouse B., Traxler K. Factors influencing rural physician retention following completion of a rural training track Family Medicine Residency Program. *WMJ Off. Publ. State Med. Soc. Wis.* 2018;117(5): 208–210.
30. Taati Keley E., Ravaghi H., Salehi M., Nasiripour A.A., Abdi Z., Meshkini A. Relationship between personal characteristics of specialist physicians and choice of practice location in Iran. *Rural Remote Health*. 2016;16(2):3412.
31. Sidibé C.S., Touré O., Broerse J.E.W., Dieleman M. Rural pipeline and willingness to work in rural areas: Mixed method study on students in midwifery and obstetric nursing in Mali. *PloS One.* 2019;14(9):e0222266. DOI: 10.1371/journal.pone.0222266.
32. Lee J., Walus A., Billing R., Hillier L.M. The role of distributed education in recruitment and retention of family physicians. *Postgrad. Med. J.* 2016;92(1090):436–440. DOI: 10.1136/postgradmedj-2015-133577.
33. Ehsani-Chimeh E., Majdzadeh R., Delavari S., Gharebelagh M.N., Rezaei S., Rad E.H. Physicians' retention rate and its effective factors in the Islamic Republic of Iran. *East. Mediterr. Health J.* 2018;24(9):830–837. DOI: 10.26719/2018.24.9.830.
34. Flores E.L.L., Manahan E.M.R., Lacanilao M.P.B., Ladaw I.M.B.T., Mallillin M.M.B., Mappatao N.T.Q. et al. Factors affecting retention in the Philippine National Rural Physician Deployment Program from 2012 to 2019: a mixed methods study. *BMC Health Serv. Res.* 2021;21(1):1201. DOI: 10.1186/s12913-021-07219-0.
35. Lisam S., Nandi S., Kanungo K., Verma P., Mishra J.P., Mairembam D.S. Strategies for attraction and retention of health workers in remote and difficult-to-access areas of Chhattisgarh, India: Do they work? *Indian J. Public Health.* 2015;59(3):189–195. DOI: 10.4103/0019-557X.164656.
36. Rawal L.B., Joarder T., Islam S.M.S., Uddin A., Ahmed S.M. Developing effective policy strategies to retain health workers in rural Bangladesh: a policy analysis. *Hum. Resour. Health.* 2015;13:36. DOI: 10.1186/s12960-015-0030-6.
37. Sirili N., Frumence G., Kiwara A., Mwangu M., Anaeli A., Nyamhanga T. et al. Retention of medical doctors at the district level: a qualitative study of experiences from Tanzania. *BMC Health Serv. Res.* 2018;18(1):260. DOI: 10.1186/s12913-018-3059-0.
38. Marsh Z., Walford L., Baker R.R., Cannaby A.M., Singh B.M. Attracting and retaining nurses through a clinical fellowship programme. *Br. J. Nurs.* 2019;28(18):1207–1209. DOI: 10.12968/bjon.2019.28.18.1207.
39. Jing L., Liu K., Zhou X., Wang L., Huang Y., Shu Z. et al. Health-personnel recruitment and retention target policy for health care providers in the rural communities: A retrospective investigation at Pudong New Area of Shanghai in China. *Int. J. Health. Plann. Manage*. 2019;34(1):e157–167. DOI: 10.1002/hpm.2618.

40. Marchand C., Peckham S. Addressing the crisis of GP recruitment and retention: a systematic review. *Br. J. Gen. Pract.* 2017;67(657):e227–237. DOI: 10.3399/bjgp17X689929.
41. Tudor Car L., Teng Y.S., How J.W., Nazri N.N.B.M., Tan A.L.X., Quah J. et al. Priorities for family physician and general practitioner recruitment and retention in Singapore: a PRIORITIZE study. *BMC Fam. Pract.* 2021;22(1):229. DOI: 10.1186/s12875-021-01570-1.
42. Gumede D.M., Taylor M., Kvalsvig J.D. Engaging future healthcare professionals for rural health services in South Africa: students, graduates and managers perceptions. *BMC Health. Serv. Res.* 2021;21(1):220. DOI: 10.1186/s12913-021-06178-w.
43. Schaefer R., Jenkins L.S., North Z. Retaining doctors and reducing burnout through a flexible work initiative in a rural South African training hospital. *Afr. J. Prim. Health Care Fam. Med*. 2021;13(1):e1–5. DOI: 10.4102/phcfm.v13i1.2799.
44. Weale V.P., Wells Y.D., Oakman J. Flexible working arrangements in residential aged care: applying a person-environment fit model. *Asia Pac. J. Hum. Resour.* 2017;55(3):356–374. DOI: 10.1111/1744-7941.12142.
45. Honda A., Vio F. Incentives for non-physician health professionals to work in the rural and remote areas of Mozambique--a discrete choice experiment for eliciting job preferences. *Hum. Resour. Health.* 2015;13:23. DOI: 10.1186/s12960-015-0015-5.
46. Shah R., Nayar V., Grzesiak A. A survey of the retention of GPs following the induction and refresher scheme in London. *Educ. Prim. Care.* 2021;32(4):226–229. DOI: 10.1080/14739879.2021.1907791.
47. Bruksch-Meck K., Crouse B., Quinn G., McCart L., Traxler K. Graduate Medical Education Initiatives to Develop the Physician Workforce in Rural Wisconsin. *WMJ Off. Publ. State. Med. Soc. Wis.* 2018;117(5):201–207.
48. Bryden B., Bryden M., Steer-Massaro J., Malope S. Family Medicine Training in Lesotho: A strategy of decentralized training for rural physician workforce development. *Front. Med.* 2021;7:582130. DOI: 10.3389/fmed.2020.582130.
49. Strasser R. Learning in context: education for remote rural health care. *Rural Remote Health.* 2016;16(2):4033.
50. O'Sullivan B.G., Couper I., Kumar P., McGrail M.R. Editorial: Effective Strategies to Develop Rural Health Workforce in Low and Middle-Income Countries (LMICs). *Front. Public Health.* 2021;9:702362. DOI: 10.3389/fpubh.2021.702362.
51. Johnson G., Byun R., Foster K., Wright F., Blinkhorn A. A longitudinal workforce analysis of a Rural Clinical Placement Program for final year dental students. *Aust. Dent. J.* 2019;64(2):181–192. DOI: 10.1111/adj.12691.
52. Woolley T., Cristobal F., Siega-Sur J., Ross S., Neusy A.J., Halili S. et al. Positive implications from socially accountable, community-engaged medical education across two Philippines regions. *Rural Remote Health*. 2018;18(1):4264. DOI: 10.22605/RRH4264.
53. McGrail M.R., Russell D.J., Campbell D.G. Vocational training of general practitioners in rural locations is critical for the Australian rural medical workforce. *Med. J. Aust.* 2016;205(5):216–221. DOI: 10.5694/mja16.00063.
54. Boonluksiri P., Tumviriyakul H., Arora R., Techakehakij W., Chamnan P., Umthong N. Community-based learning enhances doctor retention. *Educ. Health Abingdon Engl.* 2018;31(2):114–118. DOI: 10.4103/efh.EfH_153_17.
55. Gaski M., Abelsen B. Designing medical internships to improve recruitment and retention of doctors in rural areas. *Int. J. Circumpolar. Health*. 2017;76(1):1314415. DOI: 10.1080/22423982.2017.1314415.
56. Chernyshev V.M., Voevoda M.I., Strel'chenko O.V., Mingazov I.F. Rural healthcare in Russia. State, problems, prospects. *Siberian Scientific Medical Journal.*. 2022;42(4):4–14 (in Russ.). DOI: 10.18699/SSMJ20220401.
57. Bugaev D.A. Staffing of the trauma and orthopedic medical service of the subject of the Russian Federation during implementation of the "Zemsky Doctor" program. *Healthcare Manager.* 2019;2:53–58 (in Russ.).
58. Zubkov V.V. Migration potential of youth in the system of measures of state regional policy. *Government and Management in the East of Russia.* 2019;1(86):147–155 (in Russ.).
59. Kinchagulova M.V., Brynza N.S., Gorbunova O.P., Reshetnikova Yu.S. Results of the "Zemsky doctor" program in the Tyumen region. *Healthcare in the Russian Federation* 2018;62(6):89–294 (in Russ.). DOI: 10.18821/0044-197X-2018-62-6-289-294.
60. Danilov A.V. Results of the program "Zemsky doctor" in the Voronezh region for 2012–2017. *Applied Information Aspects in Medicine.* 2018;21(1):24–32 (in Russ.).
61. Employment of health workers in healthcare institutions, including work in rural areas. Luzhskaya interdistrict hospital (in Russ.). URL: http://lugamb.ru/job/invite-new-workers
62. Benefits and allowances for doctors and medical workers of the government-funded medical facilities in the Vladimir Oblast (in Russ.). URL: https://medicine33.com/subsidies
63. Nikulina Yu. N. Topical aspects of staffing of health institutions. *Education and Science: Modern Trends.* 2016;1:104–112 (in Russ.).
64. Doshchannikova O.A., Pozdeeva T.V., Filippov Yu.N., Khlapov A.L. The role of regional socioeconomic incentive programs in recruiting healthcare professionals. *Healthcare in the Russian Federation..* 2018;62(4):172–180 (in Russ.). DOI: 10.18821/0044-197X-2018-62-4-172-180.

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