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HEALTH INDICATORS IN RURAL AREAS OF AZERBAIJAN: STATISTICAL ANALYSIS OF THE CURRENT SITUATION

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Abstract
Rural populations in Azerbaijan face persistent disparities in health outcomes compared to urban residents. This study aims to examine key rural-urban health differences and assess the effects of recent health reforms on rural healthcare access and quality. A descriptive and comparative analysis was conducted using national health statistics from official government sources, focusing on indicators such as maternal and infant mortality, life expectancy, health workforce distribution and access to healthcare infrastructure. International benchmarks were also considered to contextualize Azerbaijan's position. A mixed-methods approach was employed, integrating quantitative and qualitative data to evaluate the current state and challenges of rural health. The analysis was based on national policy documents, statistical indicators and international development reports, using comparative and thematic methods. Primary data came from the State Statistical Committee, the Ministry of Health and the State Agency for Compulsory Health Insurance, providing information on infrastructure, workforce, insurance coverage and population-level health indicators. Secondary data included peer-reviewed literature, WHO and World Bank reports and UN SDG monitoring platforms, situating Azerbaijan's rural health within global trends and best practices.

Keywords
Rural population health, healthcare, maternal mortality, infant mortality, socio-economic development.

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1. Introduction

The link between health and sustainable development has been extensively explored over recent decades. According to the World Health Organization (2022), a healthy population is essential for social stability and economic growth. Healthy lifestyles are increasingly recognized as vital for achieving the Sustainable Development Goals (SDGs), particularly Goal 3: "Good Health and Well-being". Previous research has demonstrated that investment in public health infrastructure and health promotion significantly contributes to reducing poverty and social inequalities (Marmot *et al*., 2008).

Rural health disparities have become a critical global concern, with evidence showing that rural populations bear a disproportionate burden of disease and face limited access to healthcare services (Peters *et al*., 2008). These challenges are especially pronounced in developing and transition economies, where infrastructural deficiencies, workforce shortages and inequitable resource distribution persist. Strong primary health care systems are fundamental to improving rural health outcomes and achieving equitable service delivery (Starfield, 1998). Therefore, continuous investments and systematic

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reforms are essential to improve the quality of healthcare services in rural areas and ensure their equitable distribution.

In Azerbaijan, healthcare development is a key component of national development strategies. In recent years, numerous policy reforms and programs have been introduced to strengthen the health system and improve population health, particularly in rural regions. The nationwide introduction of mandatory health insurance from April 1, 2021, marks a significant step toward enhancing access to essential healthcare services for all citizens (State Agency for Compulsory Medical Insurance, 2021). This reform seeks to address longstanding issues related to healthcare availability and accessibility.

Nevertheless, a persistent challenge remains the shortage of qualified medical personnel in rural and remote areas. To mitigate this, the Cabinet of Ministers has implemented targeted programs (for 2010-2014 years and for 2023-2024 years) aimed at deploying health workers to underserved areas, retraining doctors as general practitioners and incentivizing young specialists to serve in rural locations (Cabinet of Ministers of the Republic of Azerbaijan, 2023). Despite the completion of these programs, the shortage of qualified medical personnel in rural and remote areas remains a pressing issue and requires further measures

Further strategic guidance is provided by the Development Concept for 2022-2026, which prioritizes improving living conditions for rural health workers, expanding diagnostic services, enhancing primary healthcare infrastructure and strengthening health system management (Government of Azerbaijan, 2022). These frameworks acknowledge the structural and systemic challenges affecting rural health.

Despite these initiatives, equitable access to quality healthcare in rural Azerbaijan remains limited. Socioeconomic disparities, underdeveloped infrastructure, geographical isolation and insufficient human resources continue to perpetuate health inequities between urban and rural populations. Access to essential services such as maternal and child healthcare, primary and emergency care and preventive services is unevenly distributed.

This study provides a comprehensive analysis of rural health in Azerbaijan by integrating statistical data, policy evaluation and international comparisons to identify key barriers to service delivery. It aims to offer practical, evidence-based recommendations to enhance accessibility, quality and equity in rural health services. This research contributes to the global discourse on sustainable development and health equity, in alignment with the United Nations Sustainable Development Goals, particularly Goal 3: Good Health and Well-being (United Nations, 2015). Its relevance lies in providing a timely assessment of policy implications and adopting a multidimensional approach to rural health inequalities.

2. Data analysis

Quantitative data were analyzed using descriptive statistical methods to identify disparities in healthcare access and outcomes between rural and urban populations. Key indicators included maternal and infant mortality, life expectancy, health personnel per capita and facility coverage.

Qualitative analysis involved thematic content analysis of relevant policy texts, focusing on strategies for rural healthcare development, infrastructure investment and human resource management. In addition, comparative policy analysis was conducted to evaluate Azerbaijan’s rural health policies in light of international best practices and in

alignment with SDG 3 targets to ensure healthy lives and promote well-being for all at all ages.

This study has several limitations that should be acknowledged. First, it relies primarily on publicly available national-level statistical data, which may not fully reflect the diverse health realities across different rural regions of Azerbaijan. The absence of disaggregated data by gender, age and socioeconomic status limits the scope of analysis and prevents a more nuanced understanding of vulnerable subpopulations.

Second, the study focuses on descriptive and comparative analysis, without applying advanced econometric or inferential statistical methods that could reveal causal relationships between health outcomes and structural determinants. Future studies could benefit from using regression models or longitudinal data to explore trends over time and establish more robust linkages between policy interventions and rural health improvements.

Third, the lack of primary field data-such as qualitative interviews with rural residents or healthcare providers-means that important social, cultural and behavioral dimensions of healthcare access are not directly captured in this analysis.

Future research should incorporate mixed-method approaches, combining quantitative data with qualitative insights to better understand lived experiences, local barriers and the social determinants of rural health. In addition, more targeted investigations are needed to evaluate the effectiveness of specific health policies, such as the implementation of compulsory health insurance and to assess the real-world impact of digital health solutions like telemedicine on rural populations.

3. Healthcare financing

Based on the analysis of statistical data, during the period from 2017 to 2023, the share of healthcare expenditures in the total state budget has increased by approximately three times (Table 1). In 2023, a total of 1,722.14 million AZN was allocated to healthcare from the state budget, which accounted for 4.7% of total government expenditures. The highest share of healthcare expenditures during the analyzed period was observed in 2020, reaching 6.4%, which was linked to the government's response to the COVID-19 pandemic.

Table 1. Healthcare Expenditures within Total State Budget Expenditures (million AZN)

Year	2017	2018	2019	2020	2021	2022	2023
Total Expenditures	17,538.0	22,731.6	24,425.6	26,416.3	27,422.4	32,063.1	36,458.0
Healthcare Expenditures	704.7	709.9	873.6	1,687.6	1,378.6	1,417.9	1,722.1
Share of Healthcare in Total Expenditures (%)	4.0	3.1	3.6	6.4	5.0	4.4	4.7

It is noteworthy that in developed countries, the share of healthcare expenditures in total government spending is significantly higher. In 2021, this share was 21.41% in the United States, 21.45% in Japan and 19.95% in Germany. Among neighboring countries, the share was 11.6% in Kazakhstan, 4.2% in Georgia, 26.1% in Iran, 15.1% in Russia and 11.5% in Turkey (WHO, 2021). Except for Georgia, Azerbaijan allocates a smaller share of its state budget to healthcare compared to most neighboring countries. These figures demonstrate that although healthcare funding levels have increased in

Azerbaijan in recent years, the country still lags behind global and regional peers, suggesting a need for increased budgetary prioritization of the health sector.

4. Healthcare challenges in rural areas

Rural populations face significant disparities in health status and access to quality healthcare services when compared to urban populations. A substantial portion of specialized healthcare facilities are located in urban areas, which results in limited access to quality healthcare for rural residents. This issue is particularly pronounced in emergency and acute care needs, where rural populations are more likely to encounter dangerous conditions due to insufficient healthcare infrastructure and services.

The disparity in healthcare access between rural and urban areas is not unique to developing countries, as it is observed globally, including in developed nations. For example, studies by the Centers for Disease Control and Prevention (CDC) (2024) in the United States indicate that rural populations experience poorer health outcomes compared to their urban counterparts. According to these studies, rural residents exhibit higher mortality rates from diseases such as heart disease, cancer, chronic lower respiratory diseases and stroke. This is primarily due to limited access to healthcare services and inadequate health insurance coverage. Moreover, rural residents are often required to travel long distances to access emergency medical services and specialized care.

In the United Kingdom, research on perinatal mental health disparities between rural and urban areas reveals that "women residing in rural areas are at a higher risk of experiencing depression and anxiety compared to their urban counterparts" (Ginja *et al*., 2020).

Similarly, in Vietnam, a study examining health conditions and the utilization of health services in mountainous and remote regions concluded that "health-related problems are more prevalent in remote areas and the number of people seeking medical services in these regions is significantly lower" (Tran *et al*., 2016).

Research across various regions globally has shown that the poor health outcomes in rural areas are influenced by multiple factors, including "higher poverty levels, lower service quality and the need to travel long distances for specialized services such as dental care and mental health treatment. Furthermore, hospitals offering perinatal care services are often located far from the residential areas of women in rural regions" (ACOG Committee on Health Care for Underserved Women, 2014). In particular, in developing countries, "rural and remote populations tend to experience lower life expectancy and worse health outcomes compared to urban residents. Moreover, no other region in the world faces as severe a shortage of healthcare professionals as rural areas in developing countries" (Strasser *et al*., 2016).

In Azerbaijan, healthcare challenges in rural areas are deeply intertwined with various socio-economic, geographical and cultural factors. These challenges are compounded by unfavorable living and working conditions, especially in remote areas, where occupational safety standards are low and healthcare infrastructure is underdeveloped. Contributing factors include "a shortage of qualified medical personnel, inadequate social protection for healthcare workers, inadequate or absent healthcare infrastructure, insufficient medical equipment and the lack of transportation services to transfer patients to healthcare institutions" (Dashkasan District Executive Power, 2019). Additionally, "unsatisfactory sanitary and hygienic conditions in medical institutions, ambulances failing to meet modern standards, a lack of modern medical equipment and low wages for healthcare workers" are significant barriers to the provision of quality

healthcare services (Shamkir District Executive Power, 2019). These systemic issues highlight the urgent need for targeted investments in rural health infrastructure and workforce retention policies.

The Ministry of Health of the Republic of Azerbaijan, in its Strategic Plan for 2014-2020, identifies "the insufficient material and technical base for primary healthcare services in remote rural settlements, low accessibility to healthcare services and a lack of professional healthcare personnel" as key weaknesses in rural healthcare provision (Ministry of Health of the Republic of Azerbaijan, 2014). These deficiencies result in rural residents being unable to benefit from preventive healthcare services, including early detection and timely treatment, due to limited access to primary healthcare facilities.

According to a survey conducted by the Center for Social Research, which evaluated access to healthcare services and satisfaction levels in various regions, "24.8% of the rural population reported having difficulty accessing qualified medical professionals in their area, 17% faced challenges accessing polyclinics and hospitals and 19.3% had limited access to primary healthcare services. Furthermore, a considerable proportion of individuals were unable to receive any form of healthcare services. Financial constraints were identified as the primary barrier to accessing healthcare, followed by insufficient time to visit a doctor and lack of trust in the quality of healthcare services" (Social Research Center, 2023). These findings underscore the urgent need to address significant healthcare challenges in rural areas. These challenges reflect systemic inequalities between rural and urban regions and indicate that addressing structural health system deficiencies is essential for equitable health outcomes. Overall, the healthcare challenges faced by rural populations in Azerbaijan reflect deeply rooted structural inequities that require comprehensive policy reforms, targeted investments in infrastructure and strategic efforts to retain skilled healthcare professionals in underserved areas.

4.1. Distance and transportation

Rural residents often have to travel considerable distances to access healthcare services, resulting in increased time and economic costs. Public transportation services are either inadequate or nonexistent in many rural areas. This poses substantial access barriers, especially for those with chronic conditions requiring regular medical attention. The concentration of most medical facilities in cities and district centers particularly hampers access for residents of remote villages with insufficient infrastructure. Consequently, many rural residents delay or avoid seeking medical care, which leads to the disease progression and complications and increases long-term healthcare costs and strains the public health system. This shows that transportation is not only a logistical barrier but also a major determinant of health equity in rural Azerbaijan.

4.2. Shortage of medical personnel and medical assistance

One of the main barriers to accessing healthcare in rural areas is the shortage of qualified healthcare professionals. The absence of specialists in key medical fields hinders the effective coordination and delivery of healthcare services. Although various government initiatives have aimed to address these issues, persistent challenges remain.

Primary healthcare services in rural areas are typically delivered through rural health posts and polyclinics. These institutions offer basic medical services, including immunization, health promotion and pre- and post-natal care. Despite the essential role

of these facilities in ensuring healthcare accessibility, recent years have seen fluctuations in both the number of active medical posts and the number of patients served (Table 2). Over the analyzed period, there has been a decrease of 195 facilities and 456.9 thousand patient visits. The recent decline in visits can be attributed to the growing preference for institutions operating under the mandatory health insurance system.

Table 2. Provision of medical services to rural populations

Year	2015	2018	2019	2020	2021	2022
Number of rural health posts in rural areas	1,799	1,777	1,775	1,758	1,593	1,604
Number of visits to rural health posts (thousands)	2,734.2	2,344.0	2,586.6	2,592.4	2,248.5	2,277.3

Source: Compiled by the author based on (State Statistical Committee of the Republic of Azerbaijan, 2024)

The decline in the number of rural health posts and patient visits highlights the urgent need to enhance the rural healthcare workforce and improve the working conditions to retain skilled professionals.

4.3. Telemedicine and its impact on access to healthcare services

The World Health Organization (2021) defines telemedicine as "the provision of health services by health professionals using information and communication technologies, where distance is a critical factor". Telemedicine technologies are currently widely used in developed countries, especially in rural areas and regions with insufficient health infrastructure. Through these technologies, patients can access remote clinical consultations and diagnostic services. In this way, digital health technologies mitigate geographical barriers and make healthcare services accessible to a wider population.

The implementation of telemedicine offers a number of advantages. It allows individuals to save both time and financial resources, reduces the burden on health facilities and improves access to specialized healthcare services in remote areas. In addition, it allows for remote monitoring of chronic illnesses, geriatric care and support for persons with disabilities. Early diagnosis and timely treatment of diseases help prevent complications and the development of disability. As a result, telemedicine contributes to reducing overall healthcare expenditures and improving the overall quality of life of the population.

Telemedicine technologies have also been introduced in Azerbaijan. For example, in the village of Aghaly in the Zangilan region, residents can receive medical advice and treatment services without leaving their villages. These services are provided through the "Salam Doctor" (Hello Doctor) platform (Gasimli, 2022). It should be noted that access to broadband Internet is essential for the effective operation of telemedicine services. Therefore, expanding telemedicine to other rural areas of the country could significantly improve access to healthcare services. As such, expanding telemedicine in Azerbaijan holds significant potential to reduce spatial inequalities in healthcare access, especially in underserved rural regions.

5. Life expectancy at birth of the rural population

One of the key population health indicators is life expectancy at birth. It should be noted that there is a direct relationship between the development of the healthcare system and the increase in life expectancy. Early diagnosis of diseases, timely treatment, sanitation and hygiene standards and such factors have a positive effect on people's health, including their average life expectancy at birth.

As can be seen from the data of Table 3, compiled based on the data of the State Statistics Committee, fluctuations in life expectancy at birth among the rural population occurred during the observed period. This metric rose from 72.4 years in 2005 to 76.0 years in 2022. The COVID-19 pandemic had a negative impact on life expectancy both globally and in our country, including in rural areas. In 2020 and 2021, this figure in rural areas was 72.8 and 74 years, respectively. However, in 2021, life expectancy at birth in rural Azerbaijan was 2.7 years higher than the global average.

Table 3. Life expectancy at birth in rural Azerbaijan and globally by income group, 2005-2022

Year	2005	2010	2015	2016	2017	2018	2019	2020	2021	2022
Life expectancy at birth in rural areas of Azerbaijan, years	72,4	73,4	75,7	75,8	75,9	76,0	76,1	72,8	74,0	76,0
Female Male	75,1 69,7	76,1 70,6	77,8 73,5	77,9 73,6	78,0 73,7	78,1 73,8	78,2 73,9	76,3 69,5	76,1 71,8	78,2 73,6
World			-	72,3	72,5	72,8	73,0	72,2	71,3	-
High-Income Countries			-	80,6	80,7	80,8	81,0	80,1	79,9	-
Middle-Income Countries			-	71,6	71,8	72,2	72,3	71,6	70,6	-
Low-Income Countries			-	62,2	62,6	63,0	63,4	63,0	62,5	-

Source: Compiled by the author based on (World Bank, 2023)

In recent decades, medical and technological advancements have led to an increase in life expectancy across the globe. In 2021, countries with the lowest life expectancy were primarily located in Africa, while countries with the highest life expectancy were found in the wealthier regions of Europe and Asia. Currently, the average life expectancy in the African region is approximately 64.5 years, whereas in Europe it is around 78.2 years.

In Azerbaijan, life expectancy at birth in rural areas is 5.9 years lower than in high-income countries but 3.4 years higher than in middle-income countries. This trend has remained consistent throughout the comparison period from 2005 to 2022. In other words, life expectancy at birth in rural Azerbaijan is relatively lower than in high-income countries, but higher than in middle- and low-income countries.

In the country, the average life expectancy of women is 4.6 years longer than that of men. Behavioral factors and genetic predispositions are among the main determinants of life expectancy. This trend suggests that while Azerbaijan has achieved improvements in rural life expectancy, further advancements depend on sustained investments in preventive and primary care services.

This trend suggests that while Azerbaijan has achieved measurable progress in increasing rural life expectancy, bridging the gap with high-income countries will require sustained investments in public health infrastructure, equitable access to early diagnostic services and targeted health promotion programs addressing behavioral risk factors.

6. Maternal mortality and child mortality rates in rural areas of Azerbaijan

There are differences in maternal mortality rates depending on the place of residence; maternal mortality and adolescent birth rates are higher among the rural population (Figure 1).

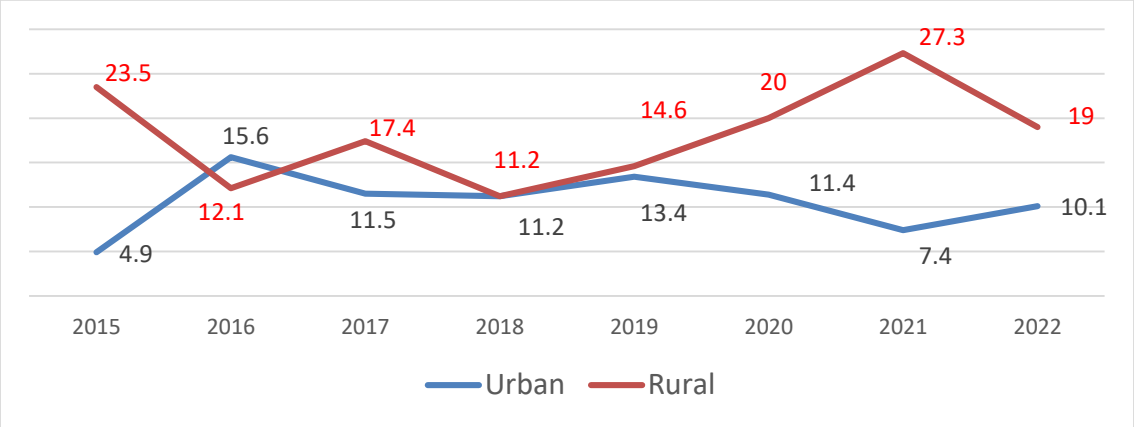

Figure 1. Maternal mortality ratio (MMR) per 100,000 live births
Source: Compiled by the author based on (State Statistical Committee of the Republic of Azerbaijan, 2023)

In 2021, the maternal mortality ratio in rural areas was 27.3 per 100,000 live births and in urban areas it was 7.4. In 2022, these rates were 19 and 10.1, respectively. In other words, a decrease in maternal mortality was observed in rural areas, while an increase was observed in urban areas. The overall trend in maternal mortality by place of residence has changed unevenly. Between 2015 and 2021, the lowest maternal mortality ratio in rural areas was recorded in 2018 (11.2) and the highest in 2021 (27.3). The highest rate in urban areas was observed in 2016 (15.6) and the lowest in 2015 (4.9).

Continuous measures have been taken at the state level in Azerbaijan to improve maternal and child health. National programs for the protection and improvement of maternal and child health for 2006-2010 and 2014-2020 were adopted in stages. Although the main goal of these programs is to improve the quality of medical and preventive services and the general health status of mothers and children, rural areas were not specifically emphasized in the latest program (2014-2020).

The inclusion of prenatal antenatal care (ANC) screenings, as well as the possibility of using outpatient and inpatient medical services, in the Compulsory Medical Insurance (CMI) package of services is a positive step. However, it is advisable to further increase the participation of women in such examinations and improve the quality of services provided.

The teenage birth rate is also high in rural areas (Figure 2).

There is also a significant disparity in this indicator between urban and rural areas. In 2021, the adolescent birth rate per 1,000 females was 44.7 in rural areas and 16.7 in urban areas. In 2022, these figures were 56.9 and 20.6, respectively. The high rate of adolescent births in rural areas is primarily associated with limited health literacy and limited access to contraceptive methods. This issue has also been highlighted in the national assessment report on sexual and reproductive health and rights in Azerbaijan. The report states: “In rural areas, access to reproductive health services for women is limited. The number of women using modern contraceptive methods is low. Women are

not provided with family planning information before or after abortion. Although the number of HIV/AIDS cases is low, the full availability of medications, including those necessary to prevent mother-to-child transmission of HIV, has not been ensured" (United Nations Population Fund, 2019).

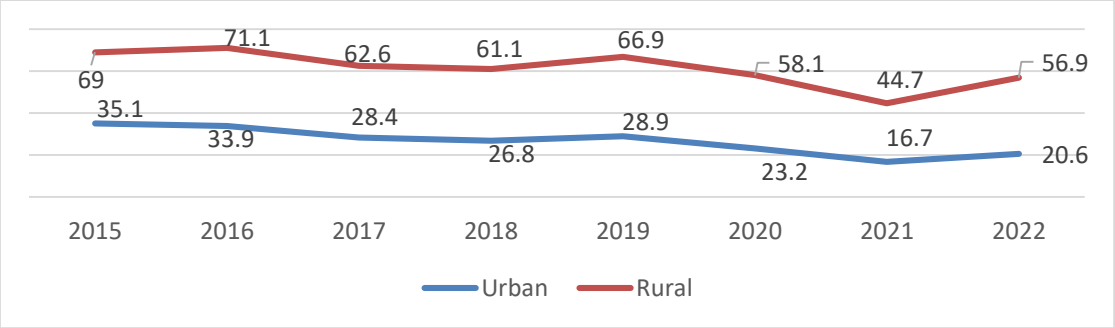

Figure 2. The birth rate among adolescents (aged 10-14 and 15-19) in Azerbaijan is the number of births per thousand women in that age group
Source: Compiled by the author based on (State Statistical Committee of the Republic of Azerbaijan, 2023)

In 2011, a Demographic and Health Survey (DHS-2011) was conducted in Azerbaijan. Based on the analysis of the survey materials, the main barriers preventing women from accessing healthcare services were identified as: "cost (including official and unofficial payments), distance, lack of transportation, absence of female medical specialists, women's reluctance to attend medical appointments alone and restrictive gender norms affecting autonomy in healthcare decisions from a male or elder female family member" (State Statistical Committee of the Republic of Azerbaijan, 2013). Despite the time elapsed since the survey, the analysis indicates that these issues remain relevant today.

In general, child mortality rate can occur due to a variety of factors. Among them are deficiencies in healthcare services, inadequate nutrition, viral infections, natural disasters and complications arising during pregnancy and childbirth. Additionally, occupation and armed conflict are also contributing factors to the rise in child mortality.

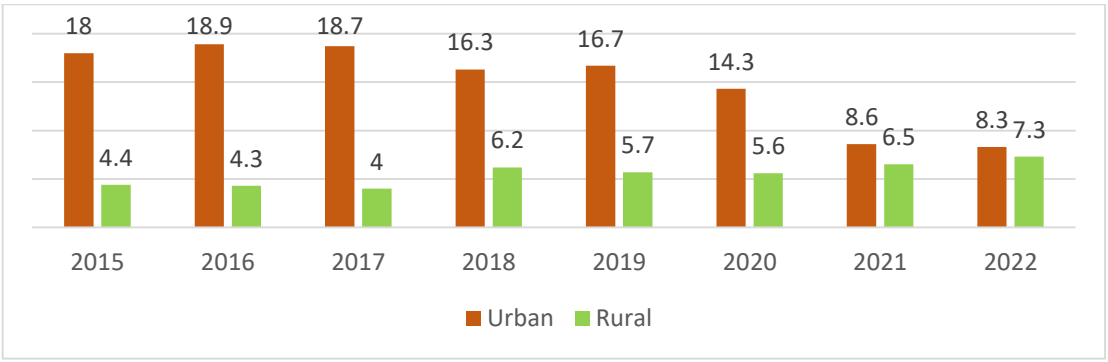

Figure 3. Number of children under one year of age who died per 1,000 live births in Azerbaijan, by place of residence
Source: Compiled by the author based on (State Statistical Committee of the Republic of Azerbaijan, 2023)

Although maternal mortality in rural areas of Azerbaijan is higher than in urban areas, the opposite trend is observed in child mortality (Figure 3). In 2021, the infant mortality ratio per 1,000 live births was 6.5 in rural areas and 8.6 in urban areas. In 2022, the rates were 7.3 and 8.3, respectively.

There are significant differences in infant mortality rates across residential areas. Although the absolute number of infants dying before the age of one is higher in urban areas, the disparity between urban and rural regions has narrowed considerably in recent years. Among the primary causes of infant mortality, perinatal conditions rank first. The proportion of deaths due to perinatal conditions among all infant deaths is 43.2% in rural areas and 38.8% in urban areas, indicating a lower standard of perinatal care in rural settings.

A similar pattern is observed in the under-five mortality rate. In 2015, the under-five mortality rate in urban areas was 15 percentage points higher than in rural areas; by 2020, this difference had decreased to 8.9 percentage points and by 2022, it had dropped to only 1.3 percentage points.

Several factors contribute to the higher child mortality rates in urban areas, including environmental pollution, greater reliance on artificial feeding for infants and the rapid spread of infectious diseases due to higher population density. On the other hand, in rural areas, the main drivers of child mortality include the poor quality of healthcare services and preventive interventions, as well as limited access to medical care for women who are unemployed or economically disadvantaged. Additional contributing factors in rural regions include inadequate sanitation and hygiene, poor working conditions, the physical burden of female labor and stress related to proximity to conflict zones. Proper hygiene and healthcare are essential for reducing child mortality.

Globally, the majority of countries with high child mortality rates are developing nations, many of which are located in Africa. In 2023, countries with the highest reported infant mortality per 1,000 live births included Afghanistan (103.06), Somalia (85.06) and the Central African Republic (88.74). Slovenia recorded the lowest rate, with 1.5 deaths per 1,000 live births. Other countries with similarly low rates include Singapore (1.54), Iceland (1.63) and Japan (1.88). Nations with lower infant mortality rates tend to also have higher life expectancies. These countries are typically characterized by a larger number of healthcare workers, higher per capita healthcare spending and greater levels of maternal education. Environmental conditions and the quality of medical infrastructure also play a crucial role. Access to vaccinations, antibiotics and balanced nutrition contributes significantly to the reduction of child mortality in these regions (Statista, 2024). These findings indicate that maternal and adolescent reproductive health outcomes in rural Azerbaijan are shaped not only by infrastructural and service-related deficiencies but also by entrenched socio-cultural barriers and limited health literacy. Targeted interventions focusing on reproductive health education, service accessibility and community engagement are essential for reducing inequalities in maternal and child health outcomes.

7. Fighting tuberculosis in rural areas

According to the WHO, inequalities in the detection and treatment of tuberculosis (TB) are particularly pronounced in rural areas of developing countries. A similar situation exists in Azerbaijan. Analysis of statistical data reveals that the tuberculosis incidence rate in rural areas of Azerbaijan is higher compared to urban areas.

In recent years, consistent and sustained measures implemented across the country have contributed to the containment of infectious diseases such as tuberculosis, malaria, hepatitis B and tropical diseases, resulting in a decline in the overall incidence among the population.

To ensure the implementation of the requirements stemming from the Law of the Republic of Azerbaijan "On the Control of Tuberculosis", a number of regulatory documents have been developed and strategies have been adopted based on WHO recommendations. By the decision of the Cabinet of Ministers of the Republic of Azerbaijan, national programs for tuberculosis control were approved for the periods of 2011-2015 and 2016-2020. Within the framework of these programs, various measures have been undertaken, including: early detection and treatment of the disease; prevention of nosocomial infections by strengthening anti-epidemic measures; improving the registration and monitoring of TB patients; enhancing community-level health literacy about TB prevention (Cabinet of Ministers of the Republic of Azerbaijan, 2016).

As illustrated in Figure 4, the tuberculosis incidence rate per 100,000 people in rural areas decreased from 61.6 in 2015 to 24.4 in 2021; however, an increase was recorded again in 2022. A comparison by place of residence indicates that TB incidence in rural areas has been consistently higher than in urban areas throughout the observed period.

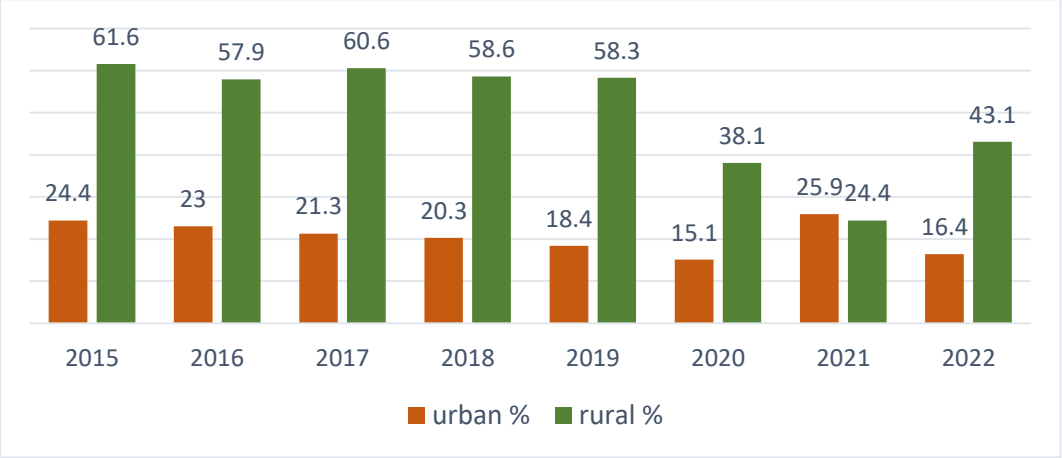

Figure 4. Tuberculosis Incidence in Azerbaijan, per 100,000 Population
Source: Compiled by the author based on (State Statistical Committee of the Republic of Azerbaijan, 2023)

It is essential to implement measures such as targeted health education campaigns, ensuring access to safe drinking water, disinfection, purification of contaminated water sources and expansion of healthcare services to combat the spread of tuberculosis in rural areas. The consistently higher incidence of tuberculosis in rural areas despite national policy efforts underscores persistent disparities in social determinants of health, including sanitation, access to healthcare services and health literacy. Therefore, strengthening rural TB control strategies must go beyond biomedical approaches and incorporate broader socio-environmental and behavioral interventions.

8. Conclusion

This study demonstrates that, despite progress achieved through recent healthcare reforms in Azerbaijan, significant challenges remain in ensuring equitable access to quality healthcare for rural populations. Key health indicators-such as life expectancy, maternal and child health and the burden of infectious diseases-continue to reflect disparities between rural and urban areas.

Rural residents face structural barriers, including limited access to reproductive and perinatal healthcare, a shortage of qualified medical personnel and underdeveloped infrastructure. Efforts to address these gaps must prioritize the expansion of reproductive health services, with an emphasis on community-based education and increased availability of family planning and maternal care, particularly for young women.

The shortage of healthcare professionals in rural areas calls for sustainable workforce development policies. These should include financial and non-financial incentives, improved working conditions and opportunities for continuing professional education to enhance the skills and retention of rural healthcare providers.

The integration of telemedicine offers significant potential to mitigate geographic and logistical barriers. By improving access to specialist consultations and chronic disease management in remote regions, telemedicine can play a transformative role in advancing health equity.

In conclusion, addressing rural healthcare disparities in Azerbaijan requires a comprehensive and multisectoral approach. This includes increased government investment in rural health infrastructure, strategic workforce planning and the adoption of innovative healthcare delivery models such as digital health technologies. Only through coordinated and sustained efforts can rural populations achieve health outcomes comparable to their urban counterparts.

Author statement

Research and Publication Ethics Statement: This study was prepared in accordance with the rules of scientific research and publication ethics.

Ethics Committee Approval: This study does not require ethics committee approval as it does not include analyses that require ethics committee approval.

Author Contributions: The contribution of the author is 100%.

Conflict of Interest: There is no conflict of interest for the author or third parties arising from the study.

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