The child healthcare system in Azerbaijan

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Abstract
The evolution of the child healthcare system in Azerbaijan is described herein. In particular, the article describes the development of child healthcare in the country, with particular focus on the Soviet and post-Soviet period. The organisation of healthcare (treatment and prophylaxis) for the general population, women and children in particular, and the current developing projects and programs are discussed. Finally, the article reports the current major priorities for child healthcare in Azerbaijan.

Keywords: Azerbaijan, children, public health, women

Introduction
The Republic of Azerbaijan, located in Eastern Europe, has a current population of approximately 10 million people (1). The highest population density is in the Capital city of Baku, with 1040 inhabitants per square kilometre, while in the rest of the country, it is 142 per square kilometre. Children aged from 0 to 18 years old comprise 26.4% (2562.8) of the total population of Azerbaijan. Approximately 20% of Azerbaijan territory is currently occupied by over a million economic and war refugees from foreign countries and forced migrants from Armenia. Major demographic data are reported in Table 1.

Evolution of the child healthcare system in Azerbaijan
Historically, the organisation of healthcare (treatment and prophylaxis) for the population, including women and children, has been of the highest priority for public health in Azerbaijan. Medicine itself has a long history in Azerbaijan, as documented by ancient manuscripts reporting the therapeutic use of plants and the description of surgical treatment of tumours and the setting of broken bones. A human skull dated from the 4th millennium BC (Eneolithic) shows traces of presumable therapeutic trepanning (2). The establishment of the first hospitals had a direct connection with the development of medical schools for the training of physicians, healers (“tebib”), and other groups of healthcare specialists. In this regard, the institutions named “Darush-shifa” (“House of Healing,” Arabic, 14th century) were science-oriented towns with a hospital, observatory, and library. In these centres, scientists performed research, educators were involved in teaching various scientific topics, including medicine, and physicians performed their practice. Written medical history is usually traced to Ibn Sina (known in the West as Avicenna) (980–1037 AD), an influential philosopher-scientist in the region, who wrote two major works related to health. Medicine, pharmacology, and other sciences were originally taught in the University of Malkham, in the Shemakha region, and educational institutions were built in Baku, Shusha, Sheki, Guba, Shemakha, Ganja, and Tebriz. By the 15th century, there were over 50 public hospitals in South Azerbaijan.

In some of the Darush-Shifa, more than 1000 people, including women and children, could be treated simultaneously. Hospitals were then financed by feudal and clerical resources, and people used to call these medical centres ‘feeding the starving.’ In the modern era, the first documented studies on diseases affecting children were conducted in the first decade of the 20th century at the Chernogorodskaya hospital of Baku (2). These studies discussed the relations between the clinical course of these diseases with the socioeconomic conditions of patients and the climatic conditions of the local area. A dairy kitchen was opened to serve all the paediatric centres of the municipal free clinics of Baku, and food was deliv-
erved daily to these centres. Since then, training courses for paediatricians have been conducted regularly in the country, and the first scientific journal ‘Mother’s Companion’ (Sputnik materi) dedicated to the mother and child clinical problems was established in the first decade of the 20th century. During that time, the Baku department of All-Russian League began its clinical activity to tackle tuberculosis and it established the League of Childhood Protection. In 1907, physicians conducted a program of free consultations called ‘Milk drops’ for infants in working villages and founded the Society of the Fight Against Child Mortality. This Society was closely associated with the Committee for the Fight Against Child Mortality related to the Pirogov Society in Moscow.

In 1913 under the initiative of the Baku municipality and leading local physicians, the first Scientific Society of Children’s Hospitals was established. The society was funded by small voluntary donations made by workers and employees, and later it was instrumental in promoting a successful fund raising campaign that prompted the construction of the first children’s hospital, called the Baku Institute of Maternity and Childhood Protection.

The State Ministry of Healthcare was first established on June 17th, 1918. The first appointed minister was Khudadat Rafibeyli, a physician who had graduated from the Russian Kharkov University in 1903, and was the most experienced surgeon in the country at the time.

During the period from 1918 through to the end of the following decade, the building of children’s institutions, including kindergartens, hospitals, sanatoria and other services for child health protection reached a peak. Under a decree of the Ministry of Health, medical services were switched to a free-of-charge, state-financed model for the entire population, and new hospitals, fully equipped laboratories, and medical posts including paediatric units were opened.

However, during this period there was a lack of physicians in Azerbaijan, with the ratio of one physician per 75,000 people. In order to improve this situation, the Republic’s Parliament promoted medical education programs and issued funds to build 35 new hospitals and 56 first-aid stations. In particular, 19 hospitals and 27 first-aid stations were opened in the Baku province, 15 hospitals and 34 first-aid stations in the Ganja province, and one hospital and two first-aid stations in Zaqatala district. At that time, the supervision for purchasing of medicines was centralised and drugs were only provided by the Department of Pharmacy of the Ministry of Health.

Maternity and childhood healthcare in Soviet Azerbaijan

With the establishment of the Soviet regime, the mother and child healthcare system developed along the principles of the Semashko system (3, 4). In 1929, the government established the Scientific-Research Institute of Maternity and Childhood Protection, which later became the Republic’s scientific-methodical centre, which supervised the network of obstetrics and paediatric care institutions active in the country. During the years of the Soviet regime, a large network of women’s clinics and maternity hospitals were opened, and obstetrics and gynaecologic departments were established within general hospitals. In total, there were 342 healthcare institutions for women and children in the Republic, where 949 obstetrician-gynaecologists and 10,633 midwives worked. The establishment of women’s clinics and centres for prenatal monitoring, and care for pregnant and parturient women providing high-qualified care, contributed to the significant decrease in maternal mortality, miscarriages, and infant mortality rates. The number of beds for pregnant women increased from 40 in 1913 to 2025 in 1940. The number of beds further increased in 1950 (n.5766), in 1960 (n.2131) and reached the peak number of 5766 beds in 1972. The development of maternity and child protection institutions allowed hospital obstetric services, introduction of systematic paediatric follow-up for children, and successful measures to combat childhood and maternity mortality. In 1967 the birth rate was 32.4 per 1000 population, and the mortality rate was 6.5 per 1000 population (compared with 25.5 in 1913). The childhood mortality rate was 10 times lower in 1967 compared with the pre-revolutionary period, and 3-times lower in comparison with the 1940s.

In 1940, the number of working pediatricians was 434. This number increased to 1609 in 1960, and in the seventies, 2118 paediatricians worked in paediatric healthcare facilities disseminated throughout the Republic (paedi-
atrial consultation services, paediatric out-patient clinics, paediatric hospitals, and paediatric departments of general hospitals). In parallel, the total number of hospital beds for children increased progressively. In 1940 there were 1700 beds, in 1950 2600, and in 1972 there were 7800 beds. Paediatric care was organized by the Republic’s Ministry of Health in 845 paediatric districts, each including local municipal paediatric outpatient clinics, where general paediatricians and paediatric specialists performed therapeutic interventions and significant preventive and prophylactic activity, child care programs aimed at promoting child wellbeing and disease prevention and treatment. These programs were supported by educational programs dedicated to families and carried out at paediatric outpatient clinics. Children in the first year of life were systematically followed up by the district’s paediatricians and specialists.

Preventive medicine was strongly implemented during the Soviet era. Every year, over 70,000 children attending kindergartens and over 100,000 children entering primary school were thoroughly examined. Annually, a total of over one million school-age children received preventive check-ups. The number of children attending preschool institutions had been constantly increasing. In 1950, there were 31,000, in 1960 53,000, in 1970 110,000, and in 1972 there were 118,000. In 1972, more than 300 nurseries were functioning, offering care to 9700 children; 1352 nursery-kindergartens were attended by 108.6 thousand children; and five children’s homes for 360 children. Over 300 summer camps (pioneer camps) were active at the beginning of the seventies, hosting an average of 95,000 children every year.

Prophylactic medical examinations, vaccination, and other interventions took place in paediatric outpatient clinics. If hospitalisation was needed, children were admitted for inpatient treatment, and after discharge from hospital, patients were kept under the observation of the district paediatrician. The network of the Republic’s sanatoria has constantly expanded during the past century. In 1928, there were two active sanatoria throughout the country, able to serve 252 patients. In 1939, the number of sanatoria increased to 31, serving 3063 patients, and in 1972 there were 57 institutions, hosting 9556 patients.

An epidemiology department and service was established during the Soviet period to monitor infectious diseases. The health-epidemiological department, founded in 1924, had the functions of public healthcare and epidemiologic supervision, and it was part of the People’s Commissariat for Health, based in the Scientific-Research Institute of Epidemiology and Microbiology. It assisted the Azerbaijan healthcare institutions in practical issues related to actions against epidemics. The health-epidemiologic service had regional, municipal, and so-called republican stations. The number of stations has been increasing constantly. In 1940, there were 31 institutions of this type in the Republic, 89 in 1960, and 86 in 1972. The Republican health-epidemiologic station was an organisational-methodical centre for the management of all health-epidemiologic work. The number of specialised departments and laboratories (e.g. bacteriologic, parasitologic, disinfectant) was also increasing. In 1972, there were 898 health-epidemiologic physicians, and 3715 physician assistants, epidemiologists, public and medical disinfectors, and instructors. Access to medicines by the Azerbaijan population, particularly in rural areas, was performed through a network of paramedic pharmacy posts. Smallpox, malaria, trachoma, and cutaneous leishmaniasis were significantly reduced and/or eradicated in Azerbaijan during this period. For instance, the incidence of visceral leishmaniasis was reduced significantly (by 94.5%) and acute intestinal diseases reduced 3.7-fold from 1967 to 1959. The incidence of typhoid infection fell 3.8 times, diphtheria 27 times, whooping cough 10 times, poliomyelitis 5.8 times, brucellosis 7.6 times, tuberculosis 1.9 times, and taeniarhynchus saginatus by 84%.

The significant increase in physician and paramedic numbers during this period was associated with the expansion of the network of medical universities and colleges in the Republic. Medical science during the Soviet period had its own strong and weak points. The Soviet regime paid special attention to the development of medical science and trained clinical and research personnel. Medical research was implemented and training courses for medical researchers were established. Outstanding Russian scientists, including Razumovsky, Davidenkov, Zdrodovsky, Ushinsky, and Povov contributed significantly to the development of medical science in Azerbaijan, as there had been almost no specialized medical healthcare in Azerbaijan before the 1917 Russian revolution (Azerbaijan was part of the Russian Empire). The Medical Faculty of the Baku University was established in 1919 and the Azerbaijan Medical University was founded in 1930 (first Rector was M. N. Kadyrli). The first Faculty of Paediatrics, which was part of the Medical School, but independent from the course of Medicine and Surgery, opened in 1936 under the decision of Azerbaijan People’s Commissariat for Health due to the great lack of specialists in the field of child healthcare. In the Institute of Advanced Education for physicians established in 1935 and named after A. M. Aliyev, over a thousand physicians and over a thousand paramedics were trained yearly. In 1972, the ratio of medical specialists per 10,000 people was 25.6, specifical-
During the period of the Soviet regime in Azerbaijan, the government developed a wide network of medical scientific-research institutions, and in 1972 there were 11 scientific-research institutions in the Republic. They included the following institutions: virology, microbiology and hygiene (G. Musabekov Institute); roentgenology, radiology, and oncology; experimental and clinical medicine; traumatology and orthopaedics; haematology and blood transfusion; maternity and childhood protection (N. K. Krupskaya Institute); balneology and physical methods of treatment (S. M. Kirov Institute); tuberculosis; medical parasitology and tropical medicine; occupational healthcare and professional diseases (M.M. Efendi-zade Institute); ophthalmology.

Medical research was strongly supported by the government. In 1972, 1417 researchers worked in the Azerbaijan Medical Institute and the Institute of Advanced Education, among them 141 MDs and 686 PhDs. A. F. Karaev, academics A. A. Namazova, A. Eyubova and others made a major contribution to Soviet paediatric science. Highly-qualified medical staff were also trained abroad, particularly in the Russian academic institutions.

**Post-Soviet development of the system of child healthcare**

The transition to democracy in the 1990s impacted on the state system, including health institutions. During these years, armed conflicts with neighbouring countries negatively affected the population’s health, including that of children. This had severe consequences, particularly with regard to the vulnerable groups of the population, with a reduction in their economic conditions and the consequential reduction in accessibility to adequate healthcare. The disintegration of the Soviet Union had a great impact on the socioeconomic development of Azerbaijan. During the first years of independence, Azerbaijan suffered serious difficulties and chaos in political, military, and financial sectors. The disintegration of the protective social state system, inherited from the Soviet era, interfered with ongoing reforms and there was no hope for a rapid economic recovery.

Demographic and health indicators declined. However, this was not officially recorded due to the turmoil that involved the state institutions. After Azerbaijan gained its full independence, a new age in the development of medicine began and a number of new laws were issued in order to regulate the functioning of the healthcare system, within the frame of a new state organisation.

In 1997, the government issued a law on “population healthcare,” which guaranteed men and women equal rights for health protection.

After a new law entitled “Establishment of the State Commission on reforms in the field of healthcare” was issued in 1998, significant changes in the system of healthcare took place. Healthcare plans and healthcare reforms became part of a global strategic program for economic and social development, which was based on secular democratic principles and market-based economics. Since 2003, the funds provided by the federal budget to the healthcare system increased yearly. A strong implementation of social reforms and the development of further strategic plans providing social protection for the population further improved the quality of healthcare in the country. In 2003, the level of funds provided for healthcare was 55.3 million Manats (local currency, which was equivalent to $32 million), while in 2009, it increased to 400 million Manats ($250 million). In the period 2005–2006, nine state programs were issued, some of them specifically dedicated to children: “maternity and child healthcare,” “immune-prophylaxis of infectious diseases in the Republic of Azerbaijan,” and “treatment and prophylaxis of genetically transmitted blood diseases.” Special programs for the treatment of children with chronic renal failure, diabetes, and oncologic diseases were also developed.

A State program for mother and child healthcare, which included the foundation of perinatal care centres in seven regions and intensive care units for infants of extremely low weight at birth, was developed in 2006, following a study that showed high mortality and morbidity in the perinatal period. In the period 2006–2010, regional perinatal centres equipped with modern devices were built in Baku, Nakhchivan, Lankaran, Sabirabad, Sheki, Ganja and Guba. Neonatal and paediatric healthcare during the past 10 years has significantly improved. Improvements include: a significant 10-fold increase in financial resources assigned to the public healthcare system; large investments for building healthcare facilities; the development of a network of healthcare services provided by the private sector. However, all charges to patients were abolished in 2008 in all public healthcare facilities provided by the Ministry of Health, which favoured a significant improvement in the health of the population.

Thalassemia is endemic in Azerbaijan. In 2009, Ms. Mehriban Aliyeva, President of the Heydar Aliyev Foundation and Goodwill Ambassador of UNESCO and ISESCO,
funded a modern, well-equipped centre for thalassemia. The centre significantly contributed to the fight against this severe disease; it became possible to treat and perform preventive measures against this hereditary blood disorder, and to implement complex interventional treatments, such as bone marrow transplantation.

The significant improvement of medical services for the population, including the establishment of home-based healthcare programs for children (2006–2015), has been of great importance in improving child care nationally, and it is considered an essential factor for the future of public health in Azerbaijan.

Since 2005, Azerbaijan has joined European programs for the eradication of infectious diseases affecting children, including measles and rubella and poliomyelitis. The first national program covered the period 2006–2010, the second 2010–2015, and a third program (2016–2020) is currently ongoing. The main goals of the third program are: improvement of preventive measures, ensuring safety and high quality of immunization, provision of high-quality vaccines and equipment, education of professional healthcare personnel, improvement of medical and preventive awareness among the population. Vaccines are provided by the State, and vaccination against 11 infectious diseases is performed in Azerbaijan at no charge. This helped to achieve high rates of vaccination coverage in childhood, and a substantial decrease in disease incidence and mortality rates, which decreased from 30% in 1933 to 11% in 2018 (6).

Medical centres and modern pharmacology industries have been developed based on international quality standards, and national public health plans are developed to manage communicable diseases such as AIDS and tuberculosis. Public health reforms are currently implemented along the lines of the traditional Semashko system, which typically provides free public health services. The cost of the services is funded by the State, including mother and child healthcare and preventive programs. However, the Semashko system presents several disadvantages, including a limited total State budget assigned to public health, and limited availability of advanced treatments and modern medical equipment, which in Azerbaijan are minimised by the progressive reforms of the healthcare system promoted by the State, including a substantial economic support. Renovation and modernisation of healthcare facilities, availability of efficient and updated equipment, accessibility to free treatment, and construction and implementation of diagnostic centres throughout the country, are the cornerstones of the program of reforms that has been strongly pursued during the last 20 years.

Healthcare Institutions of Azerbaijan closely cooperate with the World Health Organization. Protection of mothers and child health is now among the main priorities of the Ministry of Health of Azerbaijan, and new programs for the improvement of maternity and child protection are developed and implemented annually. For instance, between 2013 and 2015, a public health campaign was conducted, which included a mandatory prophylactic medical examination of the child population (0 to 18 years) living in the country.

Through a new public health national program called “Azerbaijan 2020: Look into the future,” the government plans to tackle diseases that are considered of high negative social impact (i.e. diabetes, haemophilia, thalassemia, oncologic diseases, and communicable diseases, including tuberculosis and AIDS). Further national programs are dedicated to treat drug and alcohol-addiction.

Modern child healthcare system in Azerbaijan

State policy aims at the protection of the population’s health in Azerbaijan. Improving the quality of healthcare services, to reach the standards of the most economically developed countries is part of the long-term strategy of the country. Providing the population living in rural areas with high-quality healthcare and education services, and to make medical facilities accessible and available to different social groups, including families with low-income and indigent people, are emphasized by the government to be an important part of the main strategy of the 2015–2020 government program. This includes a progressive increase in the proportion of gross domestic product allocated to healthcare, together with mechanisms that will allow a rational and targeted use of these funds.

Governmental plans also include a restriction of bureaucracy and a substantial decentralization of the managerial authority in public health organizations and medical centres. This is achieved through the effective sharing of the governance of healthcare facilities (hospital and community medical facilities), at different levels of the administrative power. The aim is to accomplish the optimisation and better coordination of their functioning.

Mandatory health insurance plans are being gradually implemented, and a quality assurance system is currently developed to guarantee the better supervision of healthcare quality and protection of patients’ rights. The reforms of the healthcare system aim at emphasising the role of primary care medicine, therefore reducing the impact and burden of patient care for the hospitals. The goal is to change the population and physicians’ culture characterised by hospital-oriented medicine, in favour of
more cost-effective first-level care medicine. Efforts are addressed at the development of appropriate working conditions useful to support family practitioners’ in their daily work, which will be facilitated through the improvement of ambulatory and out-patient public healthcare services.

The public health plan 2013–20 includes programs to limit the social impact of non-communicable diseases (e.g. smoking, obesity, physical inactivity, alcohol abuse). The plan also includes practical measures aimed at promoting healthy lifestyle, and the promotion of effective family-centered child care by raising the awareness of the population regarding their own health (7).

Prevention and care of communicable diseases are also an important part of the plans developed by the Ministry of Health. Furthermore, a National Action Plan on early prophylaxis and treatment of childhood disabilities (2014–2020) is ongoing. The government is also fully engaged in the prevention of the importation and use of unlicensed and low-quality drugs.

Education of healthcare professionals is a priority of the government, because it is considered a vital issue for an effective enhancement of the national healthcare system. Continuing education courses and programs for the improvement of knowledge and skills of medical professionals are conducted regularly. They include training programs abroad in worldwide recognized medical centres of excellence. Healthcare personnel working in paediatric healthcare facilities throughout the country are periodically re-trained and updated by dedicated programs. The national public health plans place a particular emphasis on establishing proper conditions for physicians and other healthcare professionals working in rural areas, including financial incentives. In Azerbaijan, there are currently various medical digital registries for effective monitoring of the population’s health, including home-based records, a ‘digital history’ system of citizens, and the central information system of healthcare.

**Infant mortality rate**

During the post-Soviet period, infant mortality significantly dropped, from 23.0 per 1000 live births in 1990, to 11.0 in 2015. In this regard, it is important to emphasize that the difference between high infant mortality rates in urban areas when compared with rural areas in Azerbaijan, is due to the migration of parturient women from their place of living to cities and towns at the time of childbirth.

The mortality rate among children aged under 5 years has significantly decreased during the past 30 years (from 40.5 in 1990 to 13.3 in 2015 per 1000 children). Among the most frequent causes of mortality in children aged under one year, are clinical conditions during the perinatal period (63.3%, respiratory tract diseases; 10.2%, congenital malformations; 8.4%, external factors including traumas, poisoning, accidents; 0.8%, infections).

The most frequent causes of mortality during the last 25 years in all age groups have been the following: infectious diseases, 4.4% in 1995, whereas in 2015 they decreased to 0.9%, and trauma and poisoning, which in 1995 were 6.9%, whereas in 2015 dropped to 4.8%. On the contrary, the percentage of oncologic diseases has been increasing, from 9.3% in 1995 to 13.3% in 2015.

**Conclusions**

During the complicated years of the post-Soviet disintegration, the responsible activity of the Azerbaijan Paediatric Association (APA) stimulated the government to establish public health programs that helped protect child healthcare in Azerbaijan. The Association organised a number of scientific events including international congresses, conferences, training, and workshops, which helped pediatricians in Azerbaijan to maintain and update their professional competence. Experts in the APA participated in the reform and development of the new public healthcare policies, as well as in the development of programs in the field of paediatric healthcare. Proposals by the APA were later implemented by the national healthcare system. A constant update of diagnostic procedures and evidence-based recommendations for pediatricians, the development of ethical standards in the practice of medicine, and educational and preventive programs for the population have been introduced during the last 20 years. APA is a member of the European Paediatric Association, the Union of National European Societies and Associations (EPA/UNEPSA), the International Paediatric Association (IPA), and other outstanding international scientific organizations (8).

Azerbaijan is strongly committed to building an efficient public healthcare system. This report demonstrates how Azerbaijan is committed to providing its population with comprehensive high quality medical services. The integration of Azerbaijan healthcare with international healthcare systems and programs is supported by the Azerbaijan’s new political class to improve the health of the population. Currently, favourable economic conditions support dynamic international scientific relations. The quality of Azerbaijan’s healthcare has progressively increased during the past 20 years and contributed to positioning the country internationally as a centre of public health innovation in Eastern Europe.
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