

# A Comparative Study on Primary Health Care in Republic of Korea and Republic of Uzbekistan

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**Background:** Primary health care (PHC) plays a major role to ensure the basic right and equal distribution of the essential health care services. This study presents comparative analyses of PHC in Korea and Uzbekistan, discusses the existing scenario and the challenges, and provides recommendations.

**Methods:** This study reviewed secondary data from Korea's National Statistical Information Service and the State Committee of the Republic of Uzbekistan on Statistic, regulatory legislation, research reports, and policy papers by research and international institutions. We focus on comparing input and outcome health data, PHC structure, and health expenditure.

**Results:** Overall health status of the population in Korea is better than in Uzbekistan; both countries achieved more than 95% immunization coverage. The reforms implemented in both countries provide initial health care service delivery. However, there are several challenges such as the distribution of the staff between urban and rural areas and interest of the graduates on specialization rather than working in PHC system.

**Conclusion:** PHC plays an important role in the provision of medical services to the population, addressing both health and social problems; it is the best tool for achieving universal coverage for basic health needs of the population. The community health practitioners in Korea and nurses in Uzbekistan plays main role in universal coverage through providing essential health care services. Continuous reform of the PHC system should be directed to strengthen the capacity of the PHC staff in health promotion knowledge and activities as well as to encourage population to improve their own health.

**Keywords:** Primary health care; Korea; Uzbekistan; Public health; Health care reform

## INTRODUCTION

Primary health care (PHC) is an approach to health beyond the traditional health care system that focuses on health equity-producing social policy. The PHC system can serve as an entry point into the health care system for all new needs and problems, and offer providers of care for all, person-focused care over time, coordinated and integrated care provided elsewhere or by others [1,2]. After the World Health Organization (WHO) conceptualized PHC, many countries around the world implemented policy changes oriented to improving and strengthening PHC, and health care reforms have been and continue to be part of a profound and com-

prehensive change in essential social functions and values [3,4]. In many developed countries, primary care is expected to provide an answer to rising costs and changing demand resulting from demographic and epidemiological trends. Developing countries, as well as those formerly belonging to the former Soviet Union, are struggling fundamentally to improve the performance and efficiency of their entire health systems [5]. Primary care, which used to be poorly developed or non-existent in these countries, is now being developed to improve the cost-effectiveness of the overall system and to bring adequate and responsive health services closer to the population [6].

Current study considers PHC systems in Korea and Uzbekistan

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which have different development level, socio-economic and demographic background. The Korea population is 1.6 times bigger than Uzbek population; however, overall land area is 4.4 times less. Therefore, it is occurred difference in the population density and urbanization level, which was 82.4% in Korea instead of 36.4% in Uzbekistan [7]. The age structure in studied countries are different, in case of Korea percentage of younger population and population over 60 years old is similar (15% and 17%, respectively) [8]. While younger population dominates in Uzbekistan, it was 28.5% of those under 15 years, and 7.4% were those over 60 years in 2015 which was similar to Korean figures in the 1980s [8,9]. Another important point is economic development, as Korean annual gross domestic product (GDP) growth was 2.8% and the gross national income per capita was 34,810.00 US dollars in 2015 [7]. In contrast, Uzbek's gross national income per capita was 6,200 US dollars and 7.9% of the annual GDP growth, and it is similar with Korean figures in the end of 1980s and early 1990s [7]. The current situation of the health and social-economic status determines the direction of the development of the PHC system as well as what it can be implemented from past experiences in the future.

One example of the successful establishment of PHC can be considered with the Korean experience of the National Health Insurance System. PHC reform was started in the late 1960s and early '70s and contributed to establishing the sustainable system [10]. Also, rapid economic and technological growth facilitated the development of PHC. Another example related to PHC development is the Uzbek model. Uzbekistan is a former Soviet country of Central Asia where PHC reform began in the late '90s and still has many issues in health care delivery, financing, and performance evaluation [11]. The socio-economic and demographic backgrounds of the two countries are different, with dissimilar age group distributions, risk factors, and economic and epidemiological contexts all factors that make it difficult to establish a unique PHC system that suits all countries. Although strengthening PHC services is a priority of health care reform, the main goal is delivery equal health care services with limited settings. This study is designated to identify the strengths and weaknesses of the PHC systems in Korea and Uzbekistan and to make implications for the subsequent development of PHC services delivery in Uzbekistan.

## METHODS

The subject of study is PHC system of Korea and Uzbekistan as

of 2015. In the analysis of health determinants, we used secondary data from Korea's Ministry of Health and Welfare, Uzbekistan's Ministry of Health, Korea's National Statistical Information Service, and the State Committee of the Republic of Uzbekistan on Statistics. Data were collected from 1995 to 2015 or nearest available years. Analysing of the ongoing reform and history of the establishing PHC system was done based on reviewing regulatory legislation, research reports, and policy papers by researchers and health institutions. We focused on comparing input and outcome health data, socio-economic indicators, primary health structures, health expenditures, and the educational system.

Indicators were selected according to the WHO Global Health Observatory data repository and Organization for Economic Cooperation and Development Health Working Framework [2,12]. The analysis was done on the comparison of the output and input indicators within the country and between countries. To examine the performance of PHC system in this study, we chose 10 indicators and divided them into three areas: outcome, process, and structural indicators [13]. Outcome indicators, such as life expectancy at birth, mortality rate, mother mortality, infant mortality, and under-five mortality were used to measure health outcomes [13,14]. Process indicators show the population-related health and included morbidity, immunization levels, and the prevalence of risk factors [13]. Structural indicators were defined as health care resources, including the number of medical staff (medical doctors and nurses), availability of medical facilities, and a medical staff education system [14].

## RESULTS

### 1. Health status

The health status of the population in Korea is superior to that of Uzbekistan. Table 1 presents a comparison of health indicators between two countries by year. Life expectancy at birth was higher in Korea than in Uzbekistan and it was 82.3 years and 69.4 years, respectively [12]. This difference occurred due to differences in infant and under-five mortality rates, that it was ten times higher in Uzbekistan than in Korea (33.9 and 39.1 in Uzbekistan versus 2.9 and 3.4 in Korea) [12]. Also, maternal mortality was three times higher in Uzbekistan than in Korea (36 and 11, respectively) [12]. The death rate was slightly higher in Korea than in Uzbekistan, at 5.3 versus 4.9, respectively [7]. The total fertility rate decreased in both countries during last 20 years; however, in 2014, the situation

**Table 1.** Comparison of indicators related to health

Indicators	Year	Korea	Uzbekistan
Population (thousands)*	2015	50,617.04	31,299.50
	2010	49,410.36	28,562.40
	2005	47,008.11	26,167.00
	1995	45,091.99	22,785.00
Population living in urban areas (%)*	2015	82.47	36.36
	2010	81.93	36.19
	2005	81.34	37.42
	1995	78.24	38.44
Life expectancy at birth (age, both sexes) <sup>†</sup>	2015	82.3	69.4
	2010	80.7	68.3
	2005	78.7	67.3
	1995	76.0	66.2
Total fertility rate (per woman)*	2014	1.20	2.20
	2010	1.22	2.34
	2005	1.07	2.36
	1995	1.63	3.59
Death rate (per 1,000 people)*	2015	5.3	4.9
	2010	5.1	4.9
	2005	5.0	5.5
	1995	5.3	6.4
Maternal mortality ratio <sup>†</sup>	2015	11	36
	2010	15	39
	2005	14	42
	1995	19	32
Infant mortality rate <sup>†</sup>	2015	2.9	33.9
	2010	3.5	39.6
	2005	4.8	45.9
	1995	4.7	57.3
Under-five mortality rate (per 1,000 live births) <sup>†</sup>	2015	3.4	39.1
	2010	4.1	46.1
	2005	5.6	54.2
	1995	5.5	69.5

\*From World Bank W. World development indicators [Internet]. Washington (DC): The World Bank; 2017 [cited 2017 Feb 13]. Available from: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators> [7]. <sup>†</sup>From World Health Organization. Global health observatory data repository [Internet]. Geneva: World Health Organization; 2016 [cited 2017 Mar 15]. Available from: <http://apps.who.int/gho/data/node.main.A1443?lang=en> [12].

in Uzbekistan is not critical in comparison to Korea, it was 2.2 in Uzbekistan and 1.2 in Korea [7].

Immunization coverage of Bacillus Calmette–Guérin, hepatitis B, diphtheria-tetanus-pertussis (DTP) 1 and DTP3, polio, rotavirus, rubella-containing vaccine 1, and measles (MCV) 1 and MCV2 exceeded 95% in both countries [12]. The predominant cause of mortality are non-communicable diseases (77% in Uzbekistan and 79% in Korea), among them, cancer with 30% higher prevalent in Korea and 54% cardiovascular diseases in Uzbekistan [15]. Non-communicable diseases are the number one cause of death and disability in both countries. The predominant cause of death in Korea is cancer (30%) followed by cardiovascular diseases (25%). In Uzbekistan, 54% deaths occurred due to cardiovascular

diseases. Alcohol consumption and smoking are more than twice prevalent in Korea than in Uzbekistan, whereas elevated blood pressure and obesity are more than 1.5 times higher in Uzbekistan [15].

## 2. History of primary health care reform

The PHC reform in Korea began in the late 1960s and early '70s, before the health care delivery system was hospital-oriented, emphasizing curative services concentrated in urban areas. From 1968 to 1986, the PHC system was introduced as an experimental project in 16 areas, and main objectives were to provide health services in rural areas and improve accessibility and availability of PHC for the rural population [16]. Reform of PHC delivery was inextricably linked to the reform of the health care system and the introduction of the national health insurance system. The first health insurance association of household was introduced in the Ganghwa area in 1976 and included about 300 families [10]. Later, it was introduced into 11 additional experimental areas. Implementation of these experimental projects introducing PHC delivery and the health insurance scheme contributed to achieve [10]. This system increased the responsiveness of rural populations in taking care of their own health and help to coordinate system.

By the early 1990s, the PHC system operated 267 public health centers, 1,318 health sub-centers, and 2,038 sustainability for further expansion. Additionally, a referral system was introduced in the Ganghwa area and included: health posts, health sub-centers, public health centers, community hospitals, and provincial hospitals. The referral system had two primary foci: it provided public health and curative services primary health posts (a program initiated in 1980 and involving about 5,000 inhabitants) [10]. Based on the previous performance of health sub-centers and primary health posts, the government initiated reorganization of sub-centers and primary health posts nationwide by appointing appropriate health care workers. In 1995 the main legal framework for public health was enacted, which included Regional Public Health Act (RPHA) and the National Health Promotion Act (NHPA) [17]. The RPHA defined the role and responsibilities of governments and the NHPA focused on the role and function of respective governments in public health planning and program implementation. According to RPHA, metropolitan/provincial governments are responsible for supporting district stakeholders in preparation of their own health policies [18]. However, NHPA regulated the development of a comprehensive plan for national health

care development every five years by the Ministry of Health and Welfare and required that all levels of government develop implementation plans founded on national strategy [17].

The reform of PHC in Uzbekistan began after the country achieved independence. Uzbekistan inherited the Soviet Union Health System (Semashko Health Model) a centralized state health system that concentrated on PHC as well as curative care. The health care policy implemented in the Soviet Union was directed to increasing number of the physicians, nurses, and beds [19]. Until 1997, the Uzbek PHC system was multi-level and included five types of medical facilities that required significant resources and financing. Structural reform of the PHC system was initiated in 1996, and it aimed to improve the quality of delivered services, to ensure full coverage of the population, and provide services free of charge [20]. The main concept of this reorganization was the establishment of a two-level system (rural physician point [RPP] and central district hospital) and to abolish ineffective facilities [19]. Uzbek legislation stipulates stepwise organization and reorganization of medical facilities (RPP) in rural areas until 2005, in order to provide basic health care delivery, prevention, and health promotion services [21]. In 2000, a system was introduced to coordinate quality of health care delivery and develop national standards for diagnosis and treatment in PHC facilities [22].

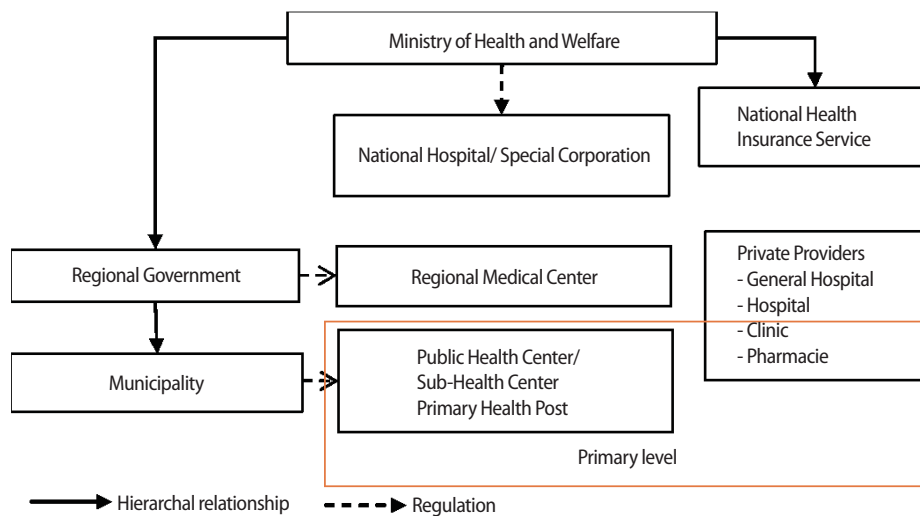
The second stage of PHC reform in Uzbekistan began in 2007 after taken of the President degree; main proposes were strengthening of the coordination function in referral system, increasing volume and quality of provided services, continually education and training of general practitioners [23]. The role of the general practitioners was considered as key in providing health care services to the population. Also, the responsibility of the staff in RPP steadily increased in the areas of health promotion and disease prevention [21]. As in the first stages of reform, the RPP was responsible mainly for prevention of infectious diseases; currently, RPP staff obligate to promote family planning, mother and child health care. Next stage is strengthening RPP role in prevention and early diagnosis of the non-communicable diseases (such as hypertension and diabetes) [19].

### 3. Primary health care system

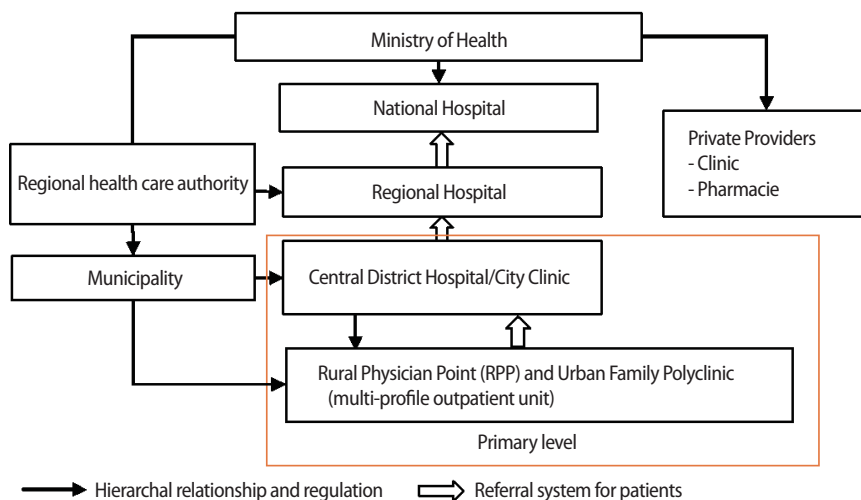
The PHC system in Korea includes public and private clinics and hospitals, public health centers, health sub-centers, and primary health posts (Figure 1). Patients have the freedom to select

PHC providers and can access health care in public or private facilities as well as have direct access to secondary- or tertiary-level providers. PHC facilities provide general medical care, diagnostic services, screening, child health care, pharmaceutical prescriptions, immunizations, emergency aid, rehabilitation, nursing services, patient transportation, and health promotion [17]. The clinics with less than 30 beds are private clinics which provide outpatient services, also, hospital with bed capacity between 30–99 beds provide basic inpatient treatment, however, its function is ambiguous [24]. The primary health posts are rural based clinics and do not have a resident physician. A registered nurse is assigned to each primary health post that is known as community health practitioner (CHP). CHPs are responsible of providing basic treatment for common diseases and injuries using 55 essential drugs [10]. Regional governments and municipalities are responsible for regulation and support of the public health facilities; according to the RPHA, they respond to regular updates in the health plan, including delivery of health care services and health assessments [17]. Well-developed telecommunication system in Korea runs telemedicine systems which cover primary health posts. Furthermore, telemedicine was operated in public health institution as the pilot project [25].

The PHC system in Uzbekistan consists of two types of facilities: one provides health care services in urban areas and the other in rural areas. Figure 2 illustrates the health system where RPP and urban multi-profile outpatient units (family polyclinics) provide gate keeping to the health care system, and patients enter the health system through it [22]. Central district and city hospitals provide more comprehensive health care. The function and services provided by primary health facilities in Uzbekistan are similar to those in Korea and include general medical care; screening; antenatal, neonatal and child healthcare; pharmaceutical prescriptions; immunization; emergency aid; and basic health education in family planning [21]. RPP generally are divided into four levels according to the population covered: level one RPP covers 1,500–2,500 inhabitants, level two serves 2,500–3,500 inhabitants, level three provides service in the area with more than 3,500 inhabitants, and level four is established as training medical center [19]. Uzbekistan PHC when compared to Korean PHC still has existing referral system; nevertheless, patients can obtain outpatient services from higher level health facilities which provide paid services, and they cover 100% of out-of-pocket expenditures [19]. PHC providers are managed by local governments and obtain practical



**Figure 1.** Organization of the health systems in the Republic of Korea. From Kwon S, Lee T, Kim C. Republic of Korea health system review. Manila: World Health Organization Regional Office for the Western Pacific; 2015 [17].



**Figure 2.** Organization of health systems in the Republic of Uzbekistan.

and methodological support from high hierarchy level medical facilities [20].

Additional PHC providers include private clinics which offer basic services such as diagnostic tests, immunization, dental services, and child healthcare. The private sector concentrates mainly in urban settings and consists of single or group practices [21]. However, specific data is not available in the utilization of primary care by type of providers, or on the scope of care delivered. Private providers complicate the situation by not providing information or coordinating activities with the public sector, and there are much duplication and overlap in services.

#### 4. Primary health care financing

The financing system in Korea and Uzbekistan is different, as Korea implemented the National Health Insurance System, while Uzbekistan adopted the National Health Services. In 2014, the total health expenditures as a percentage of GDP was higher in Korea (7.37%) when compared to Uzbekistan (5.84%) [12]. Government expenditures on health as a percentage of total expenditures is similar in both countries (54.05% in Korea and 53.29% in Uzbekistan), out-of-pocket expenditures were higher in Uzbekistan (43.93%) than in Korea (36.09%), the difference occurs because patient in Uzbekistan should fully self-cover health services which are not guaranteed and cover by the government. On the other



hand, patients in Korea pay an out-of-pocket co-payment for services provided, at a fixed rate of 30% from total PHC services costs [17].

South Korea achieved universal health coverage within 26 years from the implementation of the Medical Insurance Law enacted to permit voluntary health insurance from 1963 until 1989 [26]. The Korean National Health Insurance Services has accumulated all insurance funds and managed a unified system since 2000. The health insurance reimburses health care providers for services delivered, the government funds health promotion services. The government allocated 3.1% of total health expenditures to public health/disease prevention [17]. The Medical Aid Program (tax-based) covers the poorest population which is exempt from paying contribution and co-payments [18]. Public health facilities obtain financing from four different sources: reimbursement from the National Health Insurance Services, subsidies from central and local governments, medical aid programs, and out-of-pocket payments [17]. In contrast, the Uzbek financial system shapes on tax and out-of-pocket payments in public facilities; and state government collects and allocates funds for health care [20,21].

The state budget covers a basic benefits package that includes primary care services from public providers, emergency care, infection diseases, “socially significant” conditions (such as cancer and diabetes), vulnerable populations, children, and the elderly [21,22]. Local governments are responsible of financing RPP, and financing is provided on a capitation basis. Health care providers annually set their prospective budget for the upcoming fiscal year, based on past expenditures and required resources for health care delivery [23]. According to data obtained in 2013 by Project Health-3 financed by the World Bank, overall expenditures on PHC were 16.5% of total expenditures on health, and only 2.8% of total budget for PHC allocated on drugs and consumables [19]. Most of the allocated funds were spent on salaries, which are cal-

culated according to state guilders and dependent on staff position and qualifications.

## 5. Primary health care resources

### 1) Facilities

Table 2 presents the distribution of PHC facilities, as observed in Korea: primary health facilities are distributed among sub-health centers and health posts [27]. The Uzbek system places more concentration on RPP, and according to the national health policy, the RPP branch will be abolished soon [19]. PHC facilities in both countries are equipped with the basic medical equipment necessary for providing health care. Primary health posts and sub-health centers in Korea are equipped with medical devices for providing basic health screening and care, and the population can receive physiotherapy services in the primary health posts [28]. Public health centers are equipped with more advanced health care instruments and provide more complex and complicated diagnoses and basic treatment. In Uzbekistan, the RPP is equipped with basic equipment and patients can obtain basic diagnosis and treatment services [21].

### 2) Human resources

Comparison analyses of the human resources available in each country revealed that the absolute number of medical doctors was 1.5 times higher in Korea than in Uzbekistan; however, the density per 1,000 population was slightly higher in Uzbekistan [12]. Only 3.2% of physicians in Korea provide services in PHC facilities. In the case of Uzbekistan, 12.2% of general practitioners in the public sector provide PHC to the population [29] (Table 3). The total number of nurses is similar in both countries, but the density per 1,000 population is two times higher in Uzbekistan. In both countries, the distribution of health care human resources between urban and rural areas is still a big issue. To prevent the lack of public

**Table 2.** Comparison of primary health care facilities

Country	Facilities type	Area	Number	Density per 100,000 population
Korea, 2015*	Public health center	City, county, ward	254	0.50
	Sub-health center	Eup, myeon	1,331	2.60
	PHP <sup>†</sup>	Ri (remote area)	1,904	3.73
Uzbekistan, 2013 <sup>‡</sup>	RPP and urban family polyclinic (multi-profile outpatient unit)	City, rural area	3,506	11.59 <sup>§</sup>
	RPP branch	Remote area	315	1.04 <sup>§</sup>

PHP, primary health post; RPP, rural physician point.

\*From Korean Statistical Information Service. Statistical database: health/society/welfare [Internet]. Daejeon: Statistics Korea; c2017 [cited 2017 Jan 24]. Available from: [http://kosis.kr/statisticsList/statisticsList\\_01List.jsp?vwcd=MT\\_ZTITLE&parentId=D#SubCont](http://kosis.kr/statisticsList/statisticsList_01List.jsp?vwcd=MT_ZTITLE&parentId=D#SubCont) [27]. <sup>†</sup>PHPs cover about 5,000 inhabits. <sup>‡</sup>From Mavlyanova D, Mukhamediyarova R, Abdurakhimova S, Fuzaylov F, Tsoyi E. Development of primary health care in Uzbekistan: analytical review. Tashkent: Ministry of Health; 2013 [19]. <sup>§</sup>The calculation of the density was done using formula: (total no. of facilities×100,000)/total population.

health doctors in rural areas, Korean regulations stipulate that young male doctors be employed as public health doctors (in public sub-health centers) rather than performing military duty [10]. The Uzbek government requires graduates to be employed for three years in rural areas or remote cities if they obtain a government study grant [19].

### 3) Information technology

The rapid development of information technology in Korea lead to increasing mobile cellular subscriptions and it was 118.5 per 100 in 2015 and 89.89 out of 100 people used the Internet [7]. This indicator in Uzbekistan were 73.3 per 100 people and 42.8 per 100 people respectively [7]. In 2011, the Ministry of Health and Welfare of Korea implemented an integrated information system and electronic medical record (EMR) in all public health centers. This enables collection of information from public health centers, in order to evaluate performance and collect statistical data for evidence-based policy [17]. Telemedicine system enables providing medical doctor consultation in public health post level which employs only nursing staff. In contrast, the Uzbek health system lacks access to information technology hardware, particularly in rural areas [21]. The government started a program to develop an integrated na-

tional information system; however, it still does not include RPP and urban family polyclinics. The absence of a nationwide EMR is a limitation for management of services provided, evaluation of the quality of services, and organization of efficient, evidence-based policies. Most facilities still use paper medical records, which makes it difficult to store, evaluate, retrieve, and analyse necessary information (Table 4).

### 6. Education and training of human resources

The educational systems in Korea and Uzbekistan are different and at the same time, both countries use a two-level educational system to prepare medical doctors; this includes undergraduate and graduate programs. Figure 3 presents the organizational structure of education systems in Korea which is based on a six- or eight-year program. Students must complete a two-year premedical course or a four-year bachelor's degree before entering medical school, which is a four-year program [30,31]. Uzbekistan has implemented several changes to the previous Soviet Union medical education system, which includes more generalized studies over specialization and increasing program duration from six to seven years (Figure 4) [21]. Graduate study in the two countries is similar and includes masters and doctoral programs. In Korea, a master program is two years, and in Uzbekistan, it is three years; the medical doctor who would like to continue in the area of research can pursue a doctoral degree [17,21]. In the case of Korea, those wishing to specialize in clinical care can obtain specialization in a residency, medical education system consisting of a one-year internship and four-year residency (three years for family doctors) program; the Uzbek system includes a two-year residency education program [17,21,30].

Medical education programs in Korea are provided by 41 medical colleges (schools) in western medicine and 11 oriental medical schools [18]. Ten of the medical colleges are public and the others

**Table 3.** Comparison of human resources in PHC system (unit: person)

Indicators	Korea, 2015*	Uzbekistan, 2013†
General practitioners	3,644	8,808
Community health practitioner	1,838	-
PHC nurse	-	202,203‡

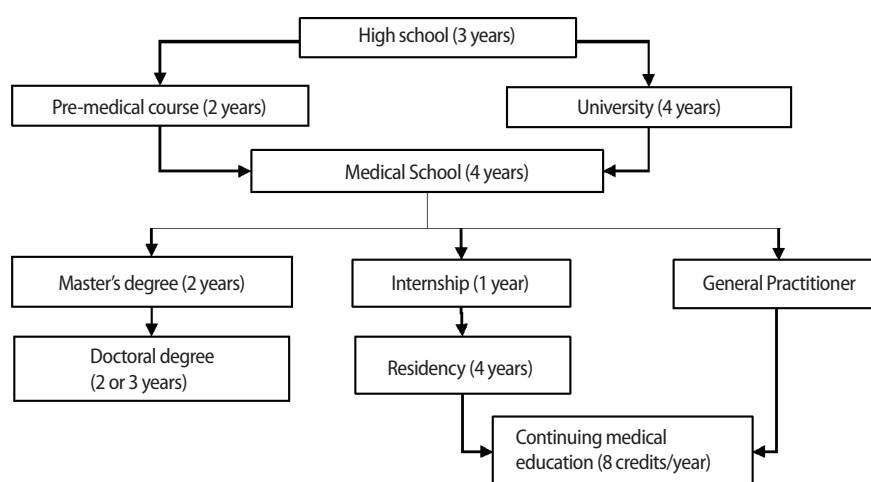
PHC, primary health care.

\*From Organization for Economic Cooperation and Development. OECD health statistics: health care resources [Internet]. Paris: Organization for Economic Cooperation and Development; 2017 [cited 2017 Jan 24]. Available from: <http://dx.doi.org/10.1787/data-00541-en> [29]. †From World Health Organization. Global health observatory data repository [Internet]. Geneva: World Health Organization; 2016 [cited 2017 Mar 15]. Available from: <http://apps.who.int/gho/data/node.main.A1443?lang=en> [12]. ‡Includes nurses and midwives, practicing or closest concept.

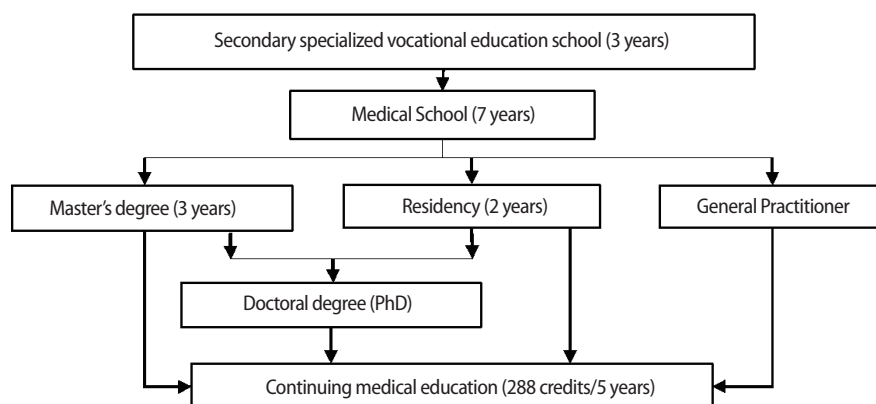
**Table 4.** Comparison of the availability of information technology at primary health level

Country	Facilities type	Hardware (personal computer with access to the Internet)	Software	
			Reporting to local government	Reporting system to national level health authority
Korea	Public health center	○	○	○
	Sub-health center	○	○	○
	Primary health post	○	○	○
Uzbekistan	RPP and urban family polyclinic (multi-profile outpatient unit)	x	x	x
	RPP branch	x	x	x

○, available; x, absent; RPP, rural physician point.



**Figure 3.** Organization of the medical education in the Republic of Korea.



**Figure 4.** Organization of the medical education in the Republic of Uzbekistan.

are private. Medical school graduates in Korea must pass a National Licensing Examination to practice as a doctor (general practitioner). In Uzbekistan, Tashkent Medical Academy, with two branches in the region, and five medical schools provide education in four major areas: treatments (general medicine), treatment with an emphasis on teaching skills (pedagogy of general medicine), general paediatrics, and sanitary-epidemiology (a six-year course) [19]. Graduates are qualified as general practitioners and can be employed in RPPs or as family doctors in urban family polyclinics. Courses on stomatology and higher education in pharmacy are available only at the Tashkent State Stomatology College and the Tashkent Institute of Pharmacy, respectively [21].

Nursing education in Korea includes a four-year university course or a three-year college program; some of the educational institutions which provided three-year course moved to the four-years nursing education program. The Korean Accreditation

Board of Nursing Education responsible for assessed nursing education quality [17]. The three-year college or four-year university education programs provide the paramedical degree. Pharmacists must complete a four-year program through a college of pharmacy, and graduates must pass a national pharmacists' examination [18]. Nursing education in Uzbekistan is provided as secondary, specialized, and vocational education. Seventy-two professional colleges provide education for nurses, midwives, paramedics, pharmacists, dental technician, and laboratory diagnostics. Also, higher nursing education was introduced in 2000 and provided by medical schools [21].

#### 1) Continuing education and training

In both countries, all practitioners involved in the health sector must be trained. According to the Korean Medical Act, all health professionals must attend a mandatory eight hours of training



**Table 5.** Strengths and weaknesses of Korean and Uzbek primary health care delivery systems

Country	Korea	Uzbekistan
Strength	Freedom of choice in health care providers Focus on health promotion and prevention Nationwide national health insurance system Unified information technology system	Referral system Availability of medical doctors (general practitioners) from point of entry Emphasis on the nursing workforce
Weakness	Unfair distribution of staff between urban and rural areas A majority of graduates focus on specialization rather than primary health care Physician and nurse shortages	Unequal distribution of staff between urban and rural areas A majority of graduates focus on specialization rather than primary health care Limited choice of health care providers Limited coordination between public and private health care service providers Lack of financing for primary health care service providers Limited number of health promotion services

each year. The respective professional association provides the training, and requirements are the same for medical staff employed in public or private health facilities [17]. Uzbekistan continuing medical education requires a medical doctor to obtain 288 credit hours every five years, and of these, 144 hours must be taken by attending short training courses [21]. The Tashkent Institute for Postgraduate Medical Education is responsible for developing and delivering training for continuing medical education. Nursing continuing education is provided by the Republican Center of Advanced Education and Specialization of Mid-level and Pharmaceutical Personal and its 13 branches. Nursing continuing education stipulates attending an educational program once every five years, with a minimum duration of 144 hours [19].

## 7. Comparison of strong and weak points of the primary health care systems

Table 5 presents a comparative analysis of the strengths and weaknesses of the PHC system in both countries. The main strength of the Korean health care system is freedom in selection of health care providers either in public or private facilities, where the population has access to essential health care services. Public health facilities in Korea focus on health promotion activities as well as prevention of infectious and non-communicable diseases [24]. Establishment of National Health Insurance with almost 100% coverage of the population contributes to full health coverage and provides quality health services with sustainable financing. A well-organized information system is another strong point of the Korean health care system, with the PHC facilities reporting to local government as well as national authorities [25]. A strength of the Uzbek PHC system is its referral system and availability of general practitioners through first-level facilities, which contributes to reducing unnecessary visits at secondary and tertiary levels, with many uncomplicated cases solved at the primary level

[19]. Furthermore, the majority of health personnel in primary health facilities in rural Uzbekistan is comprised of nurses and midwives whose responsibility is to provide basic education and work with the population; however, physicians are also obligated to make home visits [22].

Both countries face a lack of PHC physicians, due to the fact that many graduates pursue specialization. Another significant problem is the unfair distribution of medical workers between urban and rural areas. In addition, Uzbekistan PHC system has another weakness, as Uzbek law assume freedom of choice PHC providers, patients in rural area have limited access to different health providers [20,32]. Health promotion in Uzbekistan has concentrated on family planning and prevention of infectious disease; however, it is planned to expand health promotion activities targeting several major non-communicable diseases [19]. There is insufficient coordination of work between public and private health care providers. The major problem for Uzbek PHC is a lack of financing; as a result, PHC facilities cannot provide services in accordance to medical standards [23,32].

## DISCUSSION

Ever since the WHO conceptualized PHC in the 1978 year and attracted the attention of society to issues of poor health, and determined that PHC is an essential right of all people, many countries implemented various policy changes and health care reforms. Korea and Uzbekistan developed health systems in different settings; however, both countries achieved good results in the provision of health care to their respective populations. Both countries achieved almost 100% immunization coverage for most infectious diseases, a significant increase in life expectancy, and decreased maternal, infant, and under-five mortality through PHC concept [23,33]. Nevertheless, Uzbekistan's rates for maternal, infant and

under-five mortality are still high, which requires further attention. An increase in non-communicable disease in both countries indicates the need for strengthening the role of PHC in health promotion, disease prevention, and community health education. Uzbekistan decreased the number of PHC facilities, while Korea established additional public facilities with responsibility for providing PHC and health promotion services [10,17].

Another dimension of PHC delivery is financing. Reimbursement payments within the National Health Insurance System in Korea provide sustainable provision of health care services for the population [28]. Uzbekistan financing system is based on a capitation and residual basis, and most of the budget goes to salary and operational costs of the RPP, with a small portion allocated to purchase pharmacy, consumables, and equipment maintenance [19]. This situation influences on the quality of provided services and patient are forced to get treatment in high level or private facilities. Besides this, anecdotal evidence suggests that PHC in a rural area can be provided by private practitioners or through private arrangements with physicians employed in the public sector [21]. Uzbekistan still has a problem in its financing system; in this regard, the government should consider restructuring financing system from capitation base to a reimbursement [23]. A pilot project can be implemented to investigate possibilities of establishing a health insurance system in particular areas and mobilizing local financial resources, as introduced in the Ganghwa area, South Korea, in 1975 [16].

At the first stage of PHC reform in both countries, it was established a network of primary health facilities. However, it is still important for the Uzbek government to organize sustainable operation and maintenance of medical equipment in RPP. Another determinant is human resources, as the number of doctors is higher in Korea than in Uzbekistan, but the density per 1,000 population is slightly higher in Uzbekistan, along with-it, the density of nurse staff is two times less in Korea [28,33]. Distribution of physician and nursing staff between urban and rural areas are not equal and the graduates are mostly interested on obtaining a specialization and to be employed in the city. In case of Uzbekistan, this issue is not only connected to the health system but related to the overall development of the rural area [34]. The government should consider providing additional preference to the staff working in the rural area. The policy Korea implemented for engaging young male doctors to work in rural areas rather than serving in the military is a good strategy for solving physician shortages in these ar-

eas [31]. Uzbekistan provides government study grants or scholarships for students interested on working in rural areas and obligate them to work in rural areas for several years after graduation [20].

Information plays an important role in health services monitoring and evaluation, and policy implications. The information system established in Korea provides an appropriate method for data collection. Most of the problems with quality assessment in Uzbekistan are associated with low quality of medical data collection and the absence of an electronic medical record and connection of all facilities in a unified information system [23]. Although the Uzbek government has begun to establish a National Health Information System, it does not include PHC facilities yet. Improving the quality of statistical data will enhance evaluation of PHC in Uzbekistan, as well as the delivery of medical services and the financing system [19,35].

The gap in health status between the considered countries is still big; however, implementation of the reform in PHC leads to achieve the immunization coverage and decrease the infectious diseases. The PHC system in both countries has referral system to tertiary level. Referral system prevents overlapping of the provided services and decrease unnecessary visits in higher levels. The key point of the Korean PHC system is primary health post which provides basic services, including prevention and promotion through CHP, whose background is nurse. Korean experience of PHC service delivery through CHP can be applied in Uzbekistan settings for remote areas. Other implication of the Korean PHC system is establishing National Health Information System. Nowadays, it is critical point for Uzbekistan to obtain medical data and phased implementation of the electronic medical record. Also, introduction of information system helps to provide medical support for remote area which will contribute to improve of health service delivery. An important role in the provision of the services is played by the financing system. Uzbek government should consider a gradual transition to the reimbursement based payment system, which will provide stable financing of the PHC.

PHC system in both countries faced the problem with recruitment of medical staff to work in rural area. Both governments should consider providing additional incentives to recruit physicians and nurses to work at PHC system. Korean government should consider the system implemented in Uzbekistan which provides government study grants, those young doctor have to work in rural area after graduation of the medical school. Also, it can be suggested to enhance the status of the medical doctors and

nurses working in rural areas through promotion of the importance PHC and community workers.

In conclusion, PHC plays an important role in the provision of medical services to the population, addressing both health and social problems; it is the best instrument for achieving universal health coverage for basic health needs of the population. As health risks have become more diverse in the 21st century, the government should pay more attention to PHC and strengthen its work in health promotion and disease prevention. Health care system reform should be focused on subsequent problems and based on 21st century health paradigms of “new public health”.

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