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COMPARATIVE STUDY OF HEALTH STATUS BETWEEN COUNTRIES ALONG THE NEW SILK ROAD

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Abstract

Using World Statistics Data from the year 2012, health status differences between countries along the "New Silk Road" were compared and analyzed. Life expectancy at birth, life expectancy at age 60, healthy life expectancy, neonatal mortality rate, infant mortality rate, under-five mortality rate, maternal mortality ratio, as well as certain disease incidence rates were used. The study indicated that the 12 countries along the New Silk Road had longer life expectancy at birth. Females had longer life expectancy at birth than males, but life expectancy at age 60 was shorter than the global average, and healthy life expectancy at birth was also shorter. Maternal health status was generally good in each country. China, Russia, and 4 other countries had better children's health status than India, Tajikistan, Pakistan, and Afghanistan. Non-communicable diseases caused higher mortality than communicable diseases and accidental injuries. However, the age standardized mortality rates of communicable diseases in India, Tajikistan, Pakistan, and Afghanistan were still relatively high. Communicable diseases were also the leading cause of reduction in life expectancy. Tuberculosis had a more significant impact on health status. In conclusion, health status varies among the New Silk Road countries. Countries including China and Iran have relatively better health status, and non-communicable diseases were the predominant risk factor impacting health. However, in countries such as India and Afghanistan, mortality caused by communicable diseases is still prominent. Under the current trend of globalization, New Silk Road countries are supposed to collaborate to expand their healthcare systems, and improve the health conditions for their people.

Keywords: New Silk Road Countries, Health Status, Comparative Study

1. Introduction

In September 2013, Chinese president Xi Jinping visited Kazakhstan and for the first time proposed the strategic idea of creating the "New Silk Road" which aimed at stimulating economic development by collaborations. The New Silk Road economic belt passes through 18 countries, covers areas over 5,500 km2 and reaches up to 3 billion people. The implementation of the "New Silk Road" proposal will significantly influence the geopolitical pattern of Asia and Europe, and drastically improve the development of countries within the area (Zhao and Li, 2014).

As economic globalization accelerates, countries are more dependent on each other than ever before. Since health hazards are highly "migratory", the regionalization or globalization of health issues are recognized as an important concern (Jeffrey *et al.* 2011). This concern not only influences the health level of the people within one country or region, but also the interest and economy of the global population. Hence, the concept of global health was proposed (Guo *et al.* 2010). Global health focuses on global population health (Brown *et al.* 2006), and health issues that are influential beyond country boundaries that impact global politics and economy (Koplan *et al.* 2009). Global health initiatives aim to improve health status globally, reduce gaps among countries, and manage international threats to health (Macfarlane *et al.* 2008). The data indicate that there has been a significant improvement in global health status (Rao, 2004). However, the gaps in health status among countries are still significant (Marmot *et al.* 2008; Sheiham, 2009; Reading, 2009).

In recent years, health research output in India and China has been substantial increased (Chen, 2008). China and India are facing challenges of traditional and newly discovered communicable diseases, as well as health status unfair between different socioeconomic groups (Dummer and Cook, 2008). Comparison of population health between the two countries revealed that health care systems influence health status to a certain degree (Yip and Mahal, 2008). Aging and non-communicable diseases are also main factors impacting health. A comparative study on China and Russia indicated that suicide, alcohol intoxication, and other social health problems are increasing in both countries, but are more severe in Russia (Liu *et al.* 1998). Among Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, and Turkmenistan, the issue of over-commercialization, lack of systematic regulation, and sustainability in healthcare are critical that hinder the health of their populations (Wei *et al.* 2010).

Under the momentum of globalization, the health status of one country can exert a global influence. In order to fulfill the goal of improving global health, most of the challenges require global cooperation, and multilateral coordination and efforts (Sridhar and Woods, 2013; Yin and Gao, 2015), especially for public health issues (Bunyavanich and Walkup, 2001). Many researchers have conducted comparative studies on the health status between various countries in the hopes of identifying problems, outlining healthcare experiences, and establishing the foundations for healthcare collaboration (Syed *et al.* 2006; Wang *et al.* 2014).

In ancient times, nations along the Silk Road such as China, India, and many European countries conducted trade, spread religions, shared knowledge, and exchanged cultural and social practices (including healthcare) (Chen, 2008).As the strategic implementation of "the New Silk Road", political visits, economic expansion, socio-cultural and healthcare exchanges among countries will be increasing expectedly. The geopolitical exchange and migration of populations will also surge between countries within the economic zone, which may result in a series of challenges in healthcare systems. Therefore, analyzing the health status of countries along the New Silk Road is important for the improvement of health equality between these countries, advancing the health status of residents within the economic zone, and providing collaboration when facing global health challenges. It is also an essential requirement for the sustainable development of the "New Silk Road Economic Zone".

2. Methods

Data resource: Analysis was based on the data collected in 2012, which were published by World Health Statistics in 2014.

Selected countries: Current research selected countries neighboring China as well as countries of critical locations along the New Silk Road. These are the countries that share boarders and geographical landmarks with China including Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Russia, Afghanistan, Pakistan, and Mongolia as well as those positioned critically along the Silk Road including Iran (Zhao and Li, 2014), Belarus, and India (Gan, 2015). They are also members and observer countries of the Shanghai Cooperation Organization (Tang and Chen, 2004).

Health indicators: The major parameters for health status include disease incidence rate, mortality rate, and life expectancy. This study used life expectancy at birth (year), life expectancy at age 60 (year), health life expectancy at birth (year), neonatal mortality rate (per 1000 live births), infant mortality rate (probability of dying by age 1 per 1000 live births), under-five mortality(probability of dying by age 5 per 1000 live births), maternal mortality (per 100 000 live births), adult mortality rate(probability of dying between 15 and 60 years of age per 1000 population), specific mortality rate (per 100 000 population), years of life loss, as well as the incidence rate for certain communicable diseases (per 100 000 population) and prevalence (per 100 000 population) as indicators for assessing health status.

3. Results

3.1. Life Expectancy of the Population in Countries along the New Silk Road

Among the 12 countries along the New Silk Road, the life expectancy at birth of China, Belarus, and Iran were greater than the global average. The remaining countries shared a similar life expectancy as the global average, with the lowest in Afghanistan at 60 years of age. Iran has a life expectancy at age 60 for 20 years, the highest of all countries while that of all others was lower than the global average. All countries showed gender discrepancies on both life expectancy at birth and at age 60, and female life expectancy is generally greater than male. The longest healthy life expectancy at birth is 68 in China, followed by Belarus and Iran, while India, Pakistan, and Afghanistan have lower healthy life expectancies at birth (Table 1).

Table 1. Life expectancies of countries along the New Silk Road (years)

Country	Life expectancy at birth			Life expectancy at age 60			Healthy life expectancy at birth
	Both sexes	Male	Female	Both sexes	Male	Female	
China	75	74	77	19	18	21	68
India	66	64	68	17	16	18	57
Russia	69	63	75	17	14	20	61
Iran	74	72	76	20	19	20	64
Belarus	72	67	78	19	15	21	64
Pakistan	65	64	66	17	17	18	56
Tajikistan	68	67	69	17	17	17	60
Mongolia	67	64	72	16	14	18	60
Uzbekistan	69	67	72	17	16	18	61
Kazakhstan	68	63	72	16	13	18	60
Kyrgyzstan	69	66	73	17	15	19	61
Afghanistan	60	58	61	16	15	17	49
Global	70	68	73	20	18	21	62

3.2. Mortality Rate in New Silk Road Countries

Comparative analysis of the mortality rate indicated that both male and female mortality rates in China, Tajikistan, and Iran were lower than the global average, while other countries showed higher mortality rates.

Analysis of the maternal mortality rate revealed that most countries were better than the global average, but India showed a relatively high mortality rate of 190/100,000 live births, while Afghanistan was at 400/100,000 live births.

The neonatal mortality rate, infant mortality rate, and under-five mortality rate of China, Russia, Kazakhstan, Uzbekistan, Belarus, and Iran were lower than the global average, but mortality rates of India, Tajikistan, Pakistan, and Afghanistan were higher than the global average (Table 2).

Further investigation revealed that causes of under-five mortality rate were due to acute respiratory infections, premature birth, intrapartum-related complications, congenital anomalies, and injuries (Table 3).

Table 2. The mortality rates in countries along the New Silk Road

Country	Neonatal mortality rate	Infant mortality rate	Under-five mortality rate	Maternal mortality ratio	Adult mortality rate	
					Male	Female
China	9	12	14	32	106	79
India	31	44	56	190	242	160
Russia	6	9	10	24	339	127
Iran	11	15	18	23	156	84
Belarus	3	4	5	1	287	98
Pakistan	42	69	86	170	190	157
Tajikistan	23	49	58	44	178	154
Mongolia	10	23	28	68	314	150
Uzbekistan	14	34	40	36	211	131
Kazakhstan	10	17	19	26	324	147
Kyrgyzstan	14	24	27	75	275	131
Afghanistan	36	71	99	400	294	242
Global	21	35	48	210	187	124

Table 3. The causes of death in children under age five in countries along the New Silk Road

Country	Diarrhea	Acute respiratory infections	Prematurity	Intrapartum-related complications	Neonatal sepsis	Congenital anomalies	Other diseases	Injuries
China	4	14	16	15	2	13	23	13
India	11	14	27	11	8	6	19	4
Russia	1	8	22	7	4	30	19	9
Iran	4	13	23	11	7	19	15	7
Belarus	1	6	21	7	3	37	18	8
Pakistan	11	17	19	13	10	5	18	7
Tajikistan	11	19	14	13	7	8	19	8
Mongolia	8	18	14	10	4	16	19	11
Uzbekistan	9	19	14	11	4	13	19	10
Kazakhstan	5	13	19	13	6	20	16	8
Kyrgyzstan	6	14	18	14	7	17	14	9
Afghanistan	14	20	13	11	7	3	25	7
Global	9	15	17	11	7	7	28	6

3.3. List of Diseases that Caused Age-Standardized Mortality and Years of Life Loss

Analysis of age-standardized mortality revealed that mortalities due to non-communicable diseases in all countries along the New Silk Road were higher than the global average. Mortality caused by communicable diseases and injuries was lower than non-communicable diseases. However, the age-standardized mortality rate caused by communicable diseases was still relatively high in India, Tajikistan, Pakistan, and Afghanistan.

Although the mortalities caused by acquired immune deficiency syndrome (AIDS) in all countries were lower than the global average, Russia had a relatively high mortality rate at 43/100,000. Mortality caused by tuberculosis was high in India, but other countries lower than the global average.

In terms of life expectancies, the impacts of communicable diseases, non-communicable diseases, and injuries were different. Generally, at the global level, the years of life loss due to communicable diseases, non-communicable diseases, and injuries was 39.84%, 46.98%, and 12.87% respectively. Moreover, years of life loss caused by communicable diseases was seriousin India, Tajikistan, Pakistan, and Afghanistan. Other countries showed relatively shorter years of life loss caused by communicable diseases, while non-communicable diseases were the major cause of years of life loss. Injuries were simply secondary cause resulting in life loss in China, Russia, Kazakhstan, Belarus, and Iran (Table 4).

Table 4. The age-standardized mortality rate and years of life loss in countries along the New Silk Road

Country	Age-standardized mortality rates by cause			Years of life loss			
	Communicable	Non-communicable	Injuries	All causes	Communicable	Non-communicable	Injuries
China	41	576	50	17541	1858	13475	2208
India	74	790	103	37717	3877	28356	5483
Russia	253	682	116	32584	13613	14186	4785
Iran	56	569	75	17220	3118	10302	3799
Belarus	28	683	91	31213	1543	24934	4737
Pakistan	296	669	99	37478	20789	11796	4893
Tajikistan	148	753	52	29749	14692	11930	3128
Mongolia	83	966	69	26275	5357	17033	3885
Uzbekistan	86	811	47	24124	6840	14571	2713
Kazakhstan	59	947	101	30421	3834	21333	5254
Kyrgyzstan	70	832	64	24489	5767	15300	3421
Afghanistan	363	846	169	53252	31128	12324	9801
Global	178	539	73	28311	11315	13343	3654

3.4. The Incidence Rate and Prevalence of Certain Communicable Diseases in Countries along the New Silk Road

The incidence rates of HIV/AIDS and malaria in sample countries were lower than the global average, but the incidence rate of tuberculosis was relatively high in India, Kazakhstan, Tajikistan, Pakistan, Afghanistan, and Mongolia. Comparing the prevalence of AIDS and tuberculosis, the prevalence of AIDS in all countries was lower than the global average, whereas Belarus had the highest prevalence at 243/100,000. Tuberculosis prevalence was relatively low in China, Russia, Uzbekistan, and Belarus, while the highest rate in Mongolia was at 380/100,000 (Table 5).

Table 5. The incidence rate and prevalence of certain communicable diseases in countries along the New Silk Road

Country	Incidence rate			Prevalence	
	HIV/AIDS	Malaria	Tuberculosis	HIV/AIDS	Tuberculosis
China	—	0.5	73	—	99
India	—	—	91	—	121
Russia	11	1523	176	169	230
Iran	—	1.2	21	93	33
Belarus	17	-	70	247	108
Pakistan	10	1945	231	48	376
Tajikistan	27	0.3	108	149	160
Mongolia	—	-	223	38	380
Uzbekistan	—	0	78	104	135
Kyrgyzstan	31	0	141	159	217
Afghanistan	-	1263	189	14	358
Global	33	3752	122	511	169

4. Discussion

In the 12 countries along the New Silk Road, most had preferable life expectancy rate at birth. Life expectancy of females was higher than males. Life expectancy at age 60 was lower than the global average and healthy life expectancy at birth was also relatively low. These results indicated that more attention is required for the health of males and seniors over 60 in these countries, and their quality of life needs to be improved.

Most of the countries observed in this study showed relatively good health status in pregnancy and maternity, but children's health status broadly ranged between countries. Six countries including China and Russia showed better health status of children than India, Tajikistan, Pakistan, and Afghanistan. Acute respiratory infections, prematurity, intrapartum-related complications, congenital anomalies, and injuries were the predominant threats to children's health.

Analysis of the age standardized mortality rate of all countries revealed that the mortality rate caused by non-communicable diseases was higher than that caused by communicable diseases or injuries. However, India, Tajikistan, Pakistan, and Afghanistan still expressed relatively high age standardized mortality due to communicable diseases. Communicable diseases were also the predominant causes of reduction in lifespan.

Whereas a lower incidence rate and prevalence of HIV/AIDS was present in countries along the New Silk Road, tuberculosis had a more significant impact on health status. The incidence and prevalence of tuberculosis were relatively high in India, Kazakhstan, Tajikistan, Pakistan, Afghanistan, and Mongolia.

The relatively better health status of Chinese population was a reflection of China's economic development, improvement of its healthcare system, and an enhancement of living standards (Liu, 2007). Compared to China, Russia showed lower life expectancy and higher adult mortality rate, which was most likely resulted from their unhealthy lifestyle such as alcohol drinking, smoking, reduced exercise and unhealthy diet (Zhang, 2002). Regarding children's health and communicable diseases, many issues existed in India, Tajikistan, Pakistan, Mongolia, and Afghanistan showed, the majority of them were caused by factors such as the lack of healthcare infrastructure, unfair allocation of health resources, the lack of medical technology and research (Ali, 2000; Kulzhanov and Rechel, 2007; Vogel, 2014; Foggin *et al.* 1997).

5. Conclusions

Comparative health status analysis in the 12 countries along the Silk Road indicated that health status varied broadly among these countries. Some countries expressed urgent need to change their healthcare situations. China, Iran, and other countries presented relatively better health status, whereas India, Tajikistan, Pakistan, Afghanistan, and Mongolia presented relatively poorer health statuses. On theaspectof gender, males had lower life expectancy than females, therefore more attention should be paid on male specific health issues. Non-communicable diseases, communicable diseases, and injuries all influenced health, in which non-communicable diseases had the greatest impact on mortality rate. However, the age standardized mortality rate caused by communicable diseases was still very high in India, Tajikistan, Pakistan, and Afghanistan, with communicable diseases also being a major cause of reduction in lifespan. Moreover, tuberculosis is still the main communicable disease that issued in severe harm to health.

With the trend of globalization, countries along the New Silk Road should not only focus on trade and economic development, but also collaborate, cooperate, and learn from the health sectors of other countries to better revolutionize their own healthcare system and improve the health status of their people. During the process, China carries the responsibility and obligation to play a critical role in facilitating international collaboration in healthcare (Guo, 2010).

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