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SHORT COMMUNICATION

# Improvement in Health Indicators in Iran from 2004 to 2008

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**Abstract**

*Background:* Islamic Republic of Iran has the strategic socioeconomic plans since 20 years ago in 5 year terms. It is important to know the concordance of performance in the health sector with this strategic plan.

*Materials and Methods:* To evaluate the performance of the program implemented on the basis of a 5-year socioeconomic strategic plan, healthcare indicators in the Islamic Republic of Iran at the end the 4th year of the program (2008) were evaluated and compared with the same indicators from the 1st year (2004). Indicators were selected using the Delphi technique from published indicators. Data were gathered from the current health information system.

*Results:* Trends for calculated indicators at 2 time points were evaluated at both 41 individual universities and on average at the country level.

*Conclusions:* An increasing trend of significant indicators in all medical universities was observed; however, healthcare indicators in the less-developed provinces need to be improved at an accelerated pace.

*Keywords:* Healthcare quality indicators; Performance evaluation; Medical universities; Allocation of resources

## Introduction

Although overall health and related indicators have improved over the past several decades, many people suffer from inequality of access to health services because of economic, cultural, and geographical reasons (1). Additionally, health systems are faced with numerous new challenges, including changes in disease patterns and increasing non-communicable and emerging diseases that threaten the health of people in Iran. Health systems are affected by economic crisis and inadequate resources and with the advent of modern medical technologies, the annual cost of many health systems is increasing. According to a World Health Organization (WHO) report published in 2008, approximately 100 million people in the world fall into poverty each year due to healthcare costs (2). Broad health determinants have been used to inform the public of health interventions in order to improve individual and population health . Health network systems have been developed over the past 3 decades for primary healthcare strategies, and significant progress in health status has been achieved in the Islamic Republic of Iran. Eradication of contagious diseases such as smallpox and polio and reduction in child and maternal mortality rates has been achieved (2). Medical Universities in Iran provide healthcare services in addition to engaging in medical education and research. Approximately 95 % of people have access to primary healthcare (4). A comparison of access to healthcare in Iran and neighboring countries is shown in *Table 1*.

## Material and Methods

Determining the interval between goals and current status is a critical issue in planning and policy making; thus, this study was conducted to evaluate health indicators at medical universities in order to evaluate the performance of the Iran Ministry of Health and Medical Education.

Using the Delphi technique and a list of indicators from the current country registration system, a group of experts chose a primary list of indicators to evaluate input, process, outcome, and impact of the healthcare system. Many indicators could not be changed during the period, so a short, second list of indicators was selected. After gathering data from different universities

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for 2 time periods, including 2004 and 2008, predefined indicators were estimated. The main indicators included the following:

- Population Growth Rate (GR)
- Access to primary healthcare (percentage of villages with access to PHC)
- Access to hospital beds or Bed Index (beds per 1000 persons)
- Access to a family physician in rural areas
- Bed occupancy (BO)
- Coverage of polio vaccine for children younger than 1 year
- Death rate for children younger than 5 years per 1000 born
- Maternal mortality due to pregnancy complications (per 100,000 born)
- Total physicians
- Access to sanitary water in rural areas (percent of villages with access to sanitary water)
- Total number of ambulances per 1000 persons
- Rural health houses per 1000 persons in rural areas
- Urban health centers per 12,000 persons in urban areas
- Ten primary causes of death

Significant changes in the indices were studied to evaluate trends with SPSS software and a paired *t*-test.

## Results

The study revealed that the total urban population in Iran is increasing due to an increasing trend of migration from neighboring countries and internal rural regions. In most provinces, the growth rate has clearly decreased due to increased migration from outside the province. The only exception was the Gilan province (with a GR of 0.7 %), where the decrease in growth rate was due to decreasing birthrate. The provinces of Sistano Baluchistan (3.4 %), Kerman (2.84 %), Hormozgan (2.83 %), Tehran (2.63 %), and Qom (2.07 %) exhibited the highest rate of population growth from 1996 to 2006 and had the highest rate among provinces. In Tehran (accounting for approximately 19 % of the total population) and Qom, high rates of population growth were mostly due to increased migration from other provinces. Improvements in access to primary healthcare (PHC) in rural areas in Iran was evident over the years analyzed. The Zahedan University of Medical Sciences (in the southeastern region of the country) showed the lowest index of villager access to PHC both in 2004 and 2008 as compared with other medical universities: 60 % in 2004 and 77.5 % in 2008. As shown in *Table 2*, the average country index in 2004 was 95.43 %, and in 2008, this value was estimated to be 98.08 %. The Family Physician Program in Iran began in 2004, so a related index was not available for that time; however, the country's average access to family physicians in rural regions was 96.87 % in 2008.

The average hospital bed index in 1998 was 1 bed per 1000 persons, and it increased to 1.62 in 2008 ($P = 0.001$). This index was highest in the provinces of Yazd and lowest in Ilam during both periods (1998 and 2008). Polio vaccine coverage in rural Iran was 97.40 % in 2004 and 100 % in 2008. Lowest coverage was observed at the Zahedan University of Medical Sciences in 2004 and Ilam University of Medical Sciences (in the southwestern region of the country) in 2008. The highest death rates for children younger than 5 years was reported from Birjand University of Medical Sciences and the Zahedan University of Medical Sciences: 44.46 (per 1000 live born) and 36.36, respectively, in the year 2004. The country average was 19.93 in 2008 compared to 24.37 in 2004 ($P = 0.001$) for the 41 Universities of Medical Sciences. The main indicators improved, as shown in *Table 2*. Cardiovascular diseases account for 37.80 % of deaths, traffic accidents account for 15.59 %, and cancers account for 11.6 % of deaths (*Figure 1*). These were the top 3 primary causes of death in the Iranian population in 2008.

**Table 1.** Health indicators from some WHO member countries (EMRO)

| | Iran (2008) | Pakistan | Saudi Arabia | Egypt | Syrian Arab Republic |
|---|---|---|---|---|---|
| **Population growth rate, %** | 1.6 | 1.7 [e] | 2.2 [e] | 2.1 [d] | 2.5 [e] |
| **Population with access to improved water source, %** | 95.3 | 93 [c] | 100 [d] | 94 [b] | 88 [b] |
| **primary health care units and centers,** (per 10,000 population) | 3.1 | 1.0 [e] | 0.8 [d] | 0.7 [e] | 1.0 [e] |
| **Hospital beds,** (per 10,000 persons) | 16.2 | 6.0 [e] | 21.7 [d] | 17.3 [e] | 15.1 [e] |
| **Population with access to local health services, %** | | | | | |
| **Rural** | 95 | 100 [d] | - | 90 [e] | 100 [d] |
| **Urban** | 100 | - | - | 82 [e] | 100 [d] |
| **OPV3, %** | 100 | 98 [d] | 91 [d] | 86 [e] | 94 [d] |
| **Infant mortality rate,** (per 1000 live births) | 27.0 [a] | 70.2 [c] | 17.4 [d] | 17.0 [d] | 15.5 [b] |
| **Under five mortality rate,** (per 1000 live births) | 19.9 | 90.0 [c] | 21.1 [d] | 21.8 [d] | 22.0 [b] |
| **Maternal mortality ratio,** (per 100,000 live births) | 24.1 | 27.6 [c] | 14 [d] | 55 [d] | 58 [b] |

[a] 2005, [b] 2006, [c] 2007, [d] 2008, [e] 2009 (7)

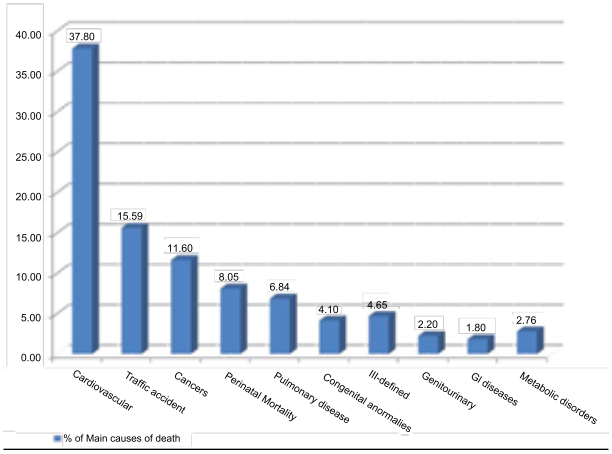


**Figure 1.** Frequencies of the top 10 primary causes of death in Iran in 2008

## Discussion

Although most primary indicators compared with those in neighboring countries (*Table 1*) have significantly improved over the past several years, evaluation of Iranian healthcare was the main reason for conducting this program. Managers will be informed of their strengths and weaknesses, and this information will be used to help policy makers allocate resources between the provinces. The less-developed provinces in Iran with higher population growth rates (i.e., Sistano Baluchistan, Kerman, and Hormozgan) experience more problems with regard to providing primary and secondary healthcare services. Therefore, these provinces should be considered high priority provinces for acquiring specialized manpower and financial resources. However, some developed provinces (i.e., Tehran) with a good position in the indicator ranking are confronted with an increasing marginal population growth rate. Therefore, intra-provincial resource mobilization for faster intervention in providing primary healthcare services may become a priority.

Provinces with a high hospital bed index (i.e., Yazd and Tehran), indicating inpatient facility development, showed an accelerated trend, and allocation of resources should be restricted to other provinces with low bed indices to establish new facilities. Cardiovascular diseases, traffic accidents, and cancers in most provinces were in the primary causes of the death in 2008. More attention is needed for disease control programs both in terms of patient screening and lifestyle improvement. Additionally, the International Classification of Diseases (ICD) should be applied by medial universities to establish a more effective national death registry system. To lower traffic accidents, increased cooperation between MOH

**Table 2.** Health indicators of Iran in 2004 and 2008

| | Years | |
|---|---|---|
| | **2004** | **2008** |
| **Population growth rate, %** | 1.96 | 1.61 |
| **Access to PHC [a], %** | 95.43<br>sd: 8.1 | 98.08<br>sd: 4.6 |
| **Access to family physician, %** | 0 [b] | 96.87<br>sd: 5.9 |
| **Bed index,** (per 1000 persons) | 1[c] | 1.62 (5) |
| **Bed occupancy, %** | 54 [c] | 66 |
| **Coverage of polio vaccine, %** | 97.40<br>sd: 4.22 | 100<br>sd: 3.7 |
| **Under five years old mortality rate,** (per 1000 live births) | 24.37<br>sd: 7.44 | 19.93<br>sd: 5.84 |
| **Maternal mortality ratio,** (per 100,000 live births) | 28.6<br>sd: 5.64 | 24.1<br>sd: 6.7 |
| **Total physicians,** (per hospital beds) | 0.55<br>sd: 0.33 | 0.69<br>sd: 0.38 |
| **Access to sanitary water, %** | 86.16<br>sd: 13.7 | 90.5<br>sd: 11.27 |
| **Total of ambulance,** (per 1000 persons) | 2.7 | 4 |
| **Health house,** (per 1000 persons in rural areas) | 0.73 | 0.76 |
| **Urban health center,** (per 12,000 persons in urban areas) | 0.62 | 0.63 |

[a] PHC: Primary health care
[b] Family physician program was started in 2004.
[c] In 1998 (6)

and other stakeholders will be necessary.

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## Conflict of interest

None declared.

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