

# Equity in health: Comparison of children health indices in poor and rich zones

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## ABSTRACT

**Background:** Although many efforts made for the advancement of medical science, it is distributed inequitably despite of all existing financial and human resources facilities. Children as the most important and vulnerable groups of society are influenced by these inequities. The Objective of this study is comparison of children health indices in rich and poor rural zones in Mashhad/Iran.

**Methods:** in this is cross sectional study, We considered a poor (Andad) and a rich (Toos) zones to compared for some health indexes. We compared some indexes like: maternal mortality rate (MMR), neonatal mortality rate (NMR), children under 1 (IMR) and under 5 years mortality rate (U5MR), low birth weight prevalence (LBW), exclusive breast feeding (EBF) and fertility rate. Data collected with check list and analyzed by SPSS-11.5.

**Results:** in our study in two poor (Andad) and rich (Toos) zones we have: Neonatal mortality rate (zero versus 5.46) (P=0.00); breast feeding indexes like exclusive breast feeding indexes up to 6 month (54.4% versus 79%) (P=0.01); have significant differences between two zones. But fertility rate indexes like total fertility rate (2.09 versus 1.95) (p=0.98) and Mean children mortality rates during 2011-2013 like children less than 5 years mortality (18.65 versus 12.13 per thousand live birth) (p=0.29) does not have statistically significant differences.

**Conclusion:** This study shows that health indexes in rich and poor zones, have significant differences.

**Keywords:** children mortality rate, neonatal mortality rate, equity in health

## Introduction

Public health is as a need and accepted right for all humans .

Health system is the most responsible system for people health, includes all organizations, institutions, human and financial resources that improving health level[1] .

The goal of the health system is to provide the highest quality of life for most people in the community but still it's not good enough [1,2] .

Children as the most important and vulnerable groups of society are influenced by these inequities[2] .

The cause of this injustice is not only in the field of medical care but also originates from socioeconomic injustice. As poverty, to limit human choices, the social and economic inequality leads to differences in access, use and health status, in the various groups of the population.[1]

For example, research shows that child mortality occurs more in countries with greater income inequality [2] a study in 2008, has shown that, the mortality rates in different age groups,

among both developed and undeveloped countries, had a big difference, it was observed that the majority of deaths was in the elderly age group, in industrialized countries and among children 0 - 5 years in underdeveloped countries . [3]

On the other hand, any attempt to solve these inequality problems would be inefficient if the program isn't organized according to real information. So the first step in planning is to identify and measure the characteristics of health inequities and how it happens. In other words, the first step is to monitoring indicators related to health equity in society[4] .

Administration of the referral system in Iran at 2004, which began in the countryside, have many benefits for health system efficacy and the health indices registration. But it doesn't have been completely investigated analytically yet. While these indices are used for assessment the health targets in other countries. Equity in health status will be achieved through monitoring this indices. For example, the Negative effect of

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socioeconomic Inequality On mortality rates And life expectancy is monitoring in many Countries. [5] For example, in Scotland, The Available difference of life expectancy in different social groups With Different deprivation Indicators, is a main index to monitor. [6] In England, monitoring differences in life expectancy in different area of country is One of the Two Basic Principle of health Programs [7] Movahedi et al have reported improve in indicators of child mortality in the country However, this improvement has not been equal throughout the country. In this study, improving health indices was more significant in Tehran, central provinces and aggregation of indices was more significant in south-east provinces[8] .

Most studies on equity in health indices has been limited to a few indices. So, a study for monitoring several important indicators at a same time, will be necessary.

Also, according to surveys conducted in Mashhad University of Medical Sciences Information System, there is no similar study has been conducted in Khorasan province, so this study was to evaluate and compare the equity in health indices in a deprived zone (Andad) and a rich zone (Toos) in Mashhad city.

## Method

This study is a cross-sectional study. Since Mashhad city has vast rural areas, according to deprived area definition by the Ministry of medical education and Health [9] a poor (Andad) and Rich (Toos) zones are considered to be compared in terms of some health indices. To do so, the files and documents of all the families covered by Health, Treatment Centers of Andad (with a population of 5366) and Toos (with a population of 9178) have been studied in 2012. To gather the considered information from the health centers, some check lists about population and, child related health indices have been filled out. Indexes that have been excluded are: maternal mortality rate, neonatal mortality rate, children under 1 and 5 years mortality rate, low birth weight prevalence, exclusive breast feeding indexes, fertility indexes. The check lists have been coded and then analyzed by spss v11.5 software application. To analyze the data, descriptive statistics used to determine the analytical statistics such as chi-square test was used to test the hypothesis.

Due to improvements of health status and low incidence of maternal and child mortality in the country in recent years, the maternal mortality

was zero during 2012. Because of the importance of these indices and to interpret better, data on these indicators over the past 4 years (2010-2013) was also calculated.

## Results

### Neonatal and maternal mortality

The mortality rate of infants under one month in 2012, in Toos and Andad is 5.46 and zero in thousand live births there is very noticeable difference between two regions. Maternal mortality and children under one year and under five years are zero per thousand live births in two zones. (Table 1)

Because of the short timeframe for the study of a rare events such as infant and maternal mortality, we figured these indices for the last 4 years (2010-2013) (Table 2)

It should be noted that maternal mortality was zero in two region during this time.

The average infant mortality rate in the region during four years (2010-2013) is shown in (Table 3) Thus, although infant mortality rate, in the Andad region was less, children under one year and 5 years was more in Andad but these differences is not significant.

### Fertility rates and low birth weight prevalence

Specific fertility rates has differences especially in women at age 15 to 19 years and over 35 years (Table 4). Age-specific fertility rate in the age group 15-19 years, is about 53.6 per thousand population in Toos and about 56.4 per thousand population in Andad, but Age-specific fertility rate over 35 years is 18.7 in Toos and about 34.48 per thousand population in Andad. This difference is not statistically significant. (P = 0.11)

The prevalence of low birth weight in deprived area, Andad, 3.09% and 2.73% in Toos. There is not a significant difference between them.

General fertility rate in Andad and Toos is 68.6 and 70, respectively, and total fertility rate is 1.95 and 2.09, respectively, it does not show a significant difference. (P = 0.98)

### Breastfeeding

Exclusive breastfeeding until 6 months ratio is 79% in Toos and 54.8% in Andad. Exclusive Breastfeeding until 1year ratio is more in Toos, but the continuation of breastfeeding at the end of two year, was more in Andad. Also Formula feeding ratio is more in Toos. It should be noted that all of these indicators is significantly different (p = 0.01) (Table 5)

## Discussion and Conclusion

The mortality rate of infants under one month in 2012, in Toos and Andad is 5.46 and zero in thousand live births there is very noticeable difference between the two regions. Maternal mortality and children under one year and under five years are zero per thousand live births in two zones. (Table 1)

Because of the short timeframe for the study of a rare events such as infant and maternal mortality, we figured these indices for the last 4 years (2010-2013) (Table 2)

It should be noted that maternal mortality was zero in two region during this time.

The average infant mortality rate in the region during four years (2010-2013) (Table 3) Thus, although infant mortality rate, in the Andad region was less, children under one year and 5 years was more in Andad this differences is not significant.

Movahedi et al have reported improve in indicators of child mortality in the country However, this improvement has not been equal throughout the country for example, infant mortality rate in the country during 2000-2004 , 1995-1999 declined weakly in Kurdistan And the Bushehr and improve better in Tehran, Babol , Rafsanjan. In Yet, Qazvin, Gilan and the Khuzestan Province are important province that their infant mortality rate aggregate during this time. The Average Change of SD of Children under One Year mortality throughout the country was 6.2 to 4.9 during 1995-1999 and 2000-2004. In this study, improving health indices was more significant in Tehran, central provinces and aggregation of indices was more significant in south-east provinces[8].

Age-Specific fertility rate at older than 35 years, there is an increasing trend, but the index is higher in Andad. There should be more attention about the importance of high maternal age and adverse effects on mother and her infant. Although there is no statistical significant difference in total fertility rates, but more than the national average (about 1.87) in 2012, above . [9,10]

Meanwhile Movahedi et al have shown that in rural areas of the country, the fertility indices had little changes, during 2000-2004. Also, Northern provinces and Tehran Grew Fast comparing to Sistan Province Hormozgan and the Khuzestan. [11,12]

Prevalence of underweight in Andad and Toos was 3.09% and 2.73% respectively, the difference was not significant. According to WHO Statistics 95% of low Birth weight was born in the

undeveloped Countries. Prevalence in Developmened countries is 6%; in developing countries 18%; 17% totally. Prevalence in Iran was reported 10%[11].

Movahedi et al have shown an increase in LBW infants in rural areas of the country.[8]

Thus, although the prevalence of underweight in the region is lower than the national average, but we should still pay attention to this increasing.

Exclusive breastfeeding until 6 months is 79% in Toos and 54.8% in Andad. Exclusive Breastfeeding until 1year is more in Toos, but the continuation of breastfeeding at the end of two years, was more in Andad. Also non-breast feeding ratio is more in Toos. It should be noted that all of these indicators is significantly different ( $p = 0.01$ ) (Table 5)

The national breast feeding Committee reports that exclusive breast feeding In Children Less than 6 months was 53.1 Percent, in 2010. Breast feeding until 1 year was 84.1 Percent And Up to Two Years was 51.1Percent. [12] Although there is not big differences with regional and national indices but there is a significant difference between Andad and Toos, and this could be due to the lack of adequate training of mothers therefore, more attention to training of mothers about importance of breastfeeding in Andad is needed.

## Conclusion

This study shows that health indexes in rich and poor zones, have significant differences.

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## Tables and Diagrams

**Table 1.** Child mortality rates in two zones in 2012

p-value	Region		Index
	Andad	Toos	
$X^2$ test P=0.000	0	5.46	Infant under 1 month mortality rate
	0	0	Infant ander 1 year mortality rate
	0	0	Children under 5 year mortality rate

**Table 2.** Child mortality rates in two zones during 2010-2013

	Andad				Toos				Index
	2013	2012	2011	2010	2013	2012	2011	2010	
	0	0	11.76	10.99	20.92	5.46	0	11.98	Infant under 1 month mortality rate
	9.43	0	11.76	32.97	25.10	0	0	17.96	Infant under 1 year mortality rate
	18.90	0	11.76	43.96	25.10	0	5.46	17.96	Children under 5 year mortality rate

**Table 3.** Average child mortality rates during 2010-2013

P-value	Andad	Toos	Index
$\chi^2$ test P=0.29	5.68	9.59	Average Infant under 1 month mortality rate
	13.54	10.76	Average Infant under 1 year mortality rate
	18.65	12.13	Average Children under 5 year mortality rate

**Table 4.** Fertility indices and low birth weight rate

p-value	Andad	Toos	index
$\chi^2$ test P=0.11	56.4	53.6	Fertility rate at age 15-19 year
	34.48	18.7	Fertility rate over 35 year
-	3.09	2.73	Low birth weight
P=0.98	70	68.6	General fertility rate
	2.09	1.95	Total fertility rate

**Table 5.** Exclusive breast feeding indices in two zones

p-value	Region		index
	Andad	Toos	
$\chi^2$ test P=0.01	54.8	79	Exclusive breast feeding until 6 month ratio
	81.3	91.7	Continuation of breast feeding until 1 year ratio
	47.4	39.5	Continuation of breast feeding until 2 year ratio
	1.3	4.1	Formula feeding ratio

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