Available online at **www.ijmrhs.com**

Special Issue 9S: Medical Science and Healthcare: Current Scenario and Future Development

ISSN No: 2319-5886

International Journal of Medical Research & Health Sciences, 2016, 5, 9S:492-499

Assessing the Level of Development in Selected Cities in Razavi Khorasan province in Iran with an Approach to Health Indicators

Ahmed Arabkhani[1], Ghahraman Mahmodi[2]*, Soleyman Saravani[3] and Ghasem Abedi[4]

[1]*MSc of health services management, Sari Branch, Islamic Azad University, Sari, Iran*
[2]*Assistant Professor Department of Health Services, Sari Branch, Islamic Azad University, Sari, Iran*
[3]*Faculty member, Department of Social Medicine, Faculty of Medicine ,Zabol University of Medical Sciences, Zabol, Iran*
[4]*Assistant Professor, Mazandaran University of Medical Sciences, Health Sciences Research Center, Sari, Iran*
**Corresponding Email: Ghahraman48@yahoo.com*

ABSTRACT

Introduction: *One of the major steps for policy and planning in the health sector and health services of the country, these services are informed of the status quo. This study aimed to assess the level of development of the city of Khorasan Razavi province approach was conducted in 2016 health indicators. Methods: The aim of this study in terms of applied and descriptive-analytic Nodal the population in this study, the city Binalood, Bardaskan and was Taybad. Data collection tools Indicators of Health and with the help of numerical taxonomy and Excel software were analyzed. Findings: According to the results of three city surveyed, ranked according to the development level and none of the selected cities in terms of indices of infectious diseases and non-communicable and relatively developed medical services ($0<x\leq0.5$) were not. Taybad city in terms of health care index Fi = 0/654 and city Binalud the index communicable diseases and non-communicable Fi = 0/680 are developing on the surface. Conclusion: The results showed that selected city of Khorasan Razavi province in terms of the development of the health indicators have not been not desirable. Therefore, it is suggested to officials and policy makers and development-oriented programs tailored to the level of development in cities is carried out.*

Keywords: Health-care index, degree of development, Khorasan Razavi

INTRODUCTION

Development in general sense means improving the material and spiritual level of human society and creating the right conditions of a healthy life for all members of the society [1]. Since no one is satisfied with their life without health, the establishment of health among fundamental principles of development is inevitable [2]. Development and health are intimately related. As the lack of development threatens the health of a large number of people in communities, damages caused by the development also affect health conditions in communities [3]. Discussion on development and underdevelopment is one of the most challenging issues in today's world which is affected by different spatial and temporal factors and conditions as well as the different value of the different criteria in assessing development [4].

In the developing world including Iran, the well-being and access to the facilities is not uniformly distributed in the society and there are significant social differences [5]. Iran, due to special geographical conditions and different

climate, has caused the emergence of different geographic landscapes and has undergone a lot of ups and downs over time. That is why development in different regions of Iran is not the same and disparities have emerged regarding the enjoyment of the benefits of development [6].

One of the major steps for policy and planning in health services and the health sector is knowing about the condition of such services in the provinces. Similarly, equality in access to health services is one of the most important goals of any society. Equality and equity in health services have multi-dimensional concepts and achieving them are among the challenges facing policymakers in this sector [7].

To determine the status of the provinces in terms of development is essential for reasonable distribution of the benefits of development in the society and planners in different communities try to achieve this purpose and reduce inequalities through the preparation and implementation of multiple programs aiming to eliminate deprivation [8].

However, as the process of development in different provinces of the country is far different, even within a province the process of development in different regions and cities is not the same; because the development of cities in a province regarding the heterogeneous distribution of resources as well as different economic, social and natural factors of the areas in some cases may not be adequate [9].

Considering the assessment of the level of development in the health sector, numerous studies have been performed in Iran and other countries, the most important of these are as follows:

Anjom-shoa in 2013 performed an assessment with the aim of analyzing the unequal distribution of health services in Yazd province using TOPSIS to evaluate each city. The results of his study show that there is a large gap in the enjoyment of facilities and health services between the cities of Yazd Province [10]. Sara'ee et al in 2013 with the aim of deeper evaluation of differences between the cities of Yazd province using Morris model and access to health care centers and determination of the level of development, concluded that the facilities and services in the cities of Yazd province were not equal [11]. Rahmat-ullah Bahrami in 2015 aiming to investigate more deeply the differences between the cities of Kurdistan in access to health care centers and to determine their level of development used linear TOPSIS. The results of his study indicate that the distribution of health services in the Kurdistan province are not distributed in line with the potentials and needs of the population [12]. All previous researchers generally studied health indicators (health centers and clinics, physicians, etc.), infrastructure indicators (electricity, piped water, water infiltration system, etc.), educational, cultural, social indicators (schools, Islamic council, access to newspapers, etc.), but what distinguishes this study compared to other studies is the analysis of health indicators for the first time in selected cities of Razavi Khorasan province using numerical taxonomy method.

MATERIALS AND METHODS

This study is applied in terms of aim, it is field in terms of degree of importance and degree of variable control, and it is documentary in terms of data collection, and it was performed during 2015. In this study the selected cities were evaluated using a number of healthcare indicators.

The study population consisted of communicable and non-communicable disease indices and health care indicators in three cities including Binalood, Bardaskan and Taibad that were randomly selected based on geographic location. To gather data for this study in 2016, the researcher referred to the faculty of Medical Sciences in Mashhad University with an introduction form that contained 16 indicators in the field of communicable and non-communicable diseases (prevalence of thalassemia major incidence, hypertension, daily smoking rate, the percentage of physical inactivity, consumption of fruits and vegetables, incidence of infant hypothyroidism, the success ratio of smear-positive pulmonary TB treatment, the prevalence rate of cholera, HIV prevalence, hepatitis B prevalence, hepatitis C prevalence, the incidence of brucellosis, the incidence of animal bites, the incidence of human rabies, the incidence of confirmed seasonal influenza, the incidence of confirmed bird flu) and 7 healthcare indictors (the ratio of hospital beds per 1,000 people, hospitalization percentage, hospitalization number per 1000 people, average drug items in prescriptions, percent of prescriptions containing antibiotic drugs, injectable drug prescriptions, prescriptions containing corticosteroids) which were among health monitoring indicators and the form was completed.

The most important ethical considerations in this study included: Receiving permission and written introduction from Azad University to conduct research and to collect data from faculty of Medical Sciences in Mashhad University using reliable and reference resources to gather information, collect data and information with complete accuracy, high sensitivity and precision in the analysis of the data and consulting with experts to ensure further completeness and accuracy of the analysis. Using the EXCEL software and numerical taxonomy model, the status of development in cities of Binalood, Bardaskan and Taibad considering selected health monitoring indicators were determined.

RESULTS

In this study, the level of development in selected cities in Razavi Khorasan province was analyzed based on non-communicable and communicable diseases and health care services by collecting information from the Department of Treatment, health departments of Mashhad University of Medical Sciences and health networks in selected cities. The results of descriptive studies on indicators of non-communicable and communicable diseases and health services are presented in Table 1.

Table 1. Results of descriptive studies on indicators of non-communicable and communicable diseases and health services in the cities of Bardaskan, Taibad and Binalood in 2015

Row	Indicator Title	Binalood	Taibad	Bardaskan
Indicators of non-communicable and communicable diseases				
1	The incidence of thalassemia major	0	0	0
2	prevalence of hypertension (Rural)	8/9	14/7	14/2
3	Daily smoking rates	9	9	9
4	physical inactivity (the percentage of people with low physical activity)	28/45	28/45	28/45
5	consumption of fruits and vegetables (average number of units consumed per day)	1/3	1/3	1/3
6	incidence of infant hypothyroidism	73	157	118
7	the success ratio of smear-positive pulmonary TB treatment	80	66/7	100
8	the prevalence rate of cholera	0	0	0
9	HIV prevalence	0/485	0/174	0/133
10	hepatitis B prevalence	2/59	2/25	2/05
11	hepatitis C prevalence	0/16	0/174	0/53
12	the incidence of brucellosis	6/4	56/7	34/7
13	the incidence of animal bites	116	318/4	419/8
14	the incidence of human rabies	0	0	0
15	the incidence of confirmed seasonal	0	0	9
16	influenza the incidence of confirmed bird flu	0	0	0
1	the ratio of hospital beds per 1,000 people	0	0/69	1/43
2	hospitalization percentage	0	58/54	63/17
3	hospitalization number per 1000 people	0	129/39	217/39
4	average drug items in prescriptions	3/1	4	2/5
5	percent of prescriptions containing antibiotic drugs	8/6	58/6	41/39
6	injectable drug prescriptions	5/58	43/8	25/96
7	prescriptions containing corticosteroids	3/82	24/04	16/38

Table 2. The data matrix

Row	Binalood	Taibad	Bardaskan,
1	0	0	0
2	8/9	14/7	14/2
3	9	9	9
4	28/45	28/45	28/45
5	1/3	1/3	1/3
6	73	157	118
7	80	66/7	100
8	0	0	0
9	0/485	0/174	0/133
10	2/59	2/25	2/05
11	0/16	0/174	0/53
12	6/4	56/7	34/7
13	116	318/4	419/8
14	0	0	0
15	9	0	0
16	0	0	0

The study of selected cities based on the communicable and non-communicable diseases

The data matrix

At this point a matrix was designed for each of the activities according to the studied indicators so that the matrix dimensions was n.m. That is, the matrix had rows as many as the studied activities and it had columns (m) as many as the number of indicatrs. For example Xn.m element in the matrix represents the m^{th} indicator in the n^{th} activity. So, one can see that each row of the matrix corresponds to a separate activity and each column is also related to a specific indicator.

The standard matrix

Since indicators are measured with different units, to eliminate the effect of these units and to replace the scale unit and to eliminate the source effect, first the mean and standard deviation (of indicators) are calculated and then the quantity of Zij standard is calculated. The first step is to calculate the mean of the columns.

The next step is to calculate the standard deviation for each column of the Xij matrix. In the third step the standardized members of the Xij matrix to be matched with the information are formed as a new matrix called standard matrix. The dimension of Matrix Z are n. m. and it is a standard matrix since with the change of variables, different scales of indicators are turned into unit scale. It is clear that statistically, the mean of each column of the standardized matrix Z is 0 and standard deviation is 1.

Table 3. The standard matrix

Row	Binalood	Taibad	Bardaskan,
1	-0/5848	-0/4823	-0/4283
2	-0/3364	-0/3091	-0/2947
3	-0/3336	-0/3762	-0/3436
4	0/2091	-0/1470	-0/1605
5	-0/5485	-0/4670	-0/4161
6	1/4524	1/3679	0/6822
7	1/6478	0/3037	0/5128
8	-0/5848	-0/4823	-0/4283
9	-0/5712	-0/4802	-0/4271
10	-0/5125	-0/4558	-0/4090
11	-0/5803	-0/4802	-0/4233
12	-0/4062	0/1858	-0/1017
13	2/6524	3/2699	3/5228
14	-0/5848	-0/4823	-0/4283
15	-0/3336	-0/4823	-0/4283
16	-0/5848	-0/4823	-0/4283

Formation of compound interval Matrix

At this stage, according to the standardized numbers in standard matrix Z, compound intervals between n-tuple various activities for m-tuple indicators are obtained as follows. However, the interval between the two activities are obtained two by two. In that case, the matrix of compound intervals can be obtained. Because the interval matrix is a symmetric matrix, it can be concluded that the matrix is symmetric and its diameter is zero. In addition, it is a square matrix with dimensions n.n. The members of this matrix show the compound interval of each activity from other activities and in each row of the matrix, the minimum amount represents the shortest interval of that activity with other activities or the closest distance between them. It is determined by the following equation:

$$D_{ab} = \sqrt{\sum_{j=1}^{m} \left(Z_{aj} - Z_{bj} \right)^2}$$

Here a and b are two options assessed. This type of operation is a type of binary calculation between two options together so that the interval of every choice with itself is zero ($D_{aa} = D_{bb} = 0$) and the interval of a and b are equal to the interval of b and a ($D_{ab} = D_{ba}$). According to the above, compound interval matrices of are formed between options which the main diagonal represents that the distance of each option from itself which is zero.

Table 4. Compound interval matrix

	Bardaskan	Taibad	Binalood
Bardaskan	0/0000	0/8290	1/7466
Taibad	0/8290	0/0000	1/6635
Binalood	1/7466	1/6635	0/0000

Calculating the shortest distance

Each element of the matrix C represents the distance between the two activities in the intended indicator. At this stage the activities that the minimum distance between them is between the upper and lower limit are homogeneous and placed in one group. If the minimum difference between the two activities is greater than the upper limit or below the lower limit, the above activities should be removed due to heterogeneity.

Table 5. The shortest distance

	Bardaskan	Taibad	Binalood	Shortest distance
Bardaskan	0/0000	0/8290	1/7466	0/8290
Taibad	0/8290	0/0000	1/6635	0/8290
Binalood	1/7466	1/6635	0/0000	1/6635

Calculating confidence interval

In this level, the minimum interval is calculated according to the mean and standard deviation of the column; and to obtain homogeneous cities, the following formula is used.

$$C_- = \bar{C} - 2sd$$
$$C_+ = \bar{C} + 2sd$$

From the last column (minimum interval), first the mean and then the standard deviation are determined and the two parameters C + and C- are calculated based on this mean and standard deviation. The gap interval between C + and C- is called diversion interval.

Mean=0.1017
SD=0.4817

At this stage, the parts with minimum interval between the lower and upper limits, are homogenous and placed in one group. According to obtained lower and upper limits, this requirement is established in this study and all cities are homogenous.

Table 6. Determining the pattern or model of development

Row	Binalood	Taibad	Bardaskan,
1	10/4794	14/0790	15/6111
2	8/9329	12/8092	14/5733
3	8/9161	13/2940	14/9490
4	5/9697	11/6752	13/5666
5	10/2457	13/9644	15/5149
6	1/44	3/6176	8/069
7	1/0092	8/7983	9/0601
8	10/4794	14/0790	15/6111
9	10/3915	14/0632	15/6017
10	10/0165	13/8808	15/4590
11	10/4503	14/0632	15/5717
12	9/3550	9/5116	13/1370
13	0/0000	0/0000	0/0000
14	10/4794	14/0790	15/6111
15	8/9161	14/0790	15/6111
16	10/4794	14/0790	15/6111

Determination of the model or paradigm of regional development (Cio)

At this stage, the interval of each region from the ideal interval is determined. Less interval from the ideal represents development and more interval shows lack of development. According to the standard matrix, the largest number in

each of the columns are selected as the optimum amount (if negative indicators of development are selected, the smallest number must be selected as the desired value). At this stage, the highest value of each column is selected as the optimum value and each of the elements of the column are subtracted from the highest value and then brought to the power 2.The procedure is then performed for all the columns.

Model or paradigm of options is obtained from the following equation:

$$C_{i0}=\sqrt{\sum (D_i-D_0)^2}$$

Cio = Is called model of development and the smaller value is the evidence of the development of the region.
Di = The numbers in the standard matrix
Do = Ideal numbers in each column

7. The final ranking of cities
At this stage, after determining the model of development for each of the cities, the degree of development of each of the points are calculated by the following formula:

$$F_i = \frac{Cio}{Co}$$

In this regard, cio is the model of each option and Co is the highest level of development. To calculate Co, the mean and standard deviation of the Cio shall be determined. It is calculated as follows and deviation of Cio shall be determined. It is calculated as follows:

$$Co = \overline{Cio} + 2\sigma_{Cio}$$

Table 7. The value of the Coi of selected cities in 2015

City	COI
Bardaskan	14/613
Binalood	13/640
Taibad	11/294

F_i is between zero and one, and the closer it is to zero, it represents more development of the option (placement on higher rank) and the closer it is to 1, it is an indication of lack of development. In this case, the issue of taxonomy has been completed and the grading (ranking) of the options have been specified.

Table 8. Ranking of selected cities considering the indicators of communicable and non-communicable diseases in 2015

City	Fi
Bardaskan	0/880
Binalood	0/821
Taibad	0/680

The indicators of communicable and non-communicable diseases show that Binalood ranks higher than Taibad, and Taibad ranks higher than Bardaskan. Finally, to provide a better conditions of selected cities in terms of quantity and quality of all indicators, they are compared in three levels.

Table 9. Status of development of each city based on the indicators of communicable and non-communicable diseases in 2015

Row	Ranking	Development	Urban Areas	
			Name	Number
1	0<x≤0.5	Relatively developed		
2	0.5<x≤0.7	Developed	Binalood	1
3	0.7<x	Underdeveloped	Bardaskan and Taibad	2

The above table indicates that the status of selected cities based on the ranking of the indicators of communicable and non-communicable diseases, Binalood is developing but Bardaskan and Taybad are underdeveloped.

Table 10. Ranking of cities with regard to health care indicators in 2015

City	Fi
Bardaskan	0/796
Binalood	0/654
Taibad	0/875

Taibad ranks higher than Bardaskan considering healthcare indicators and Bardaskan is superior to Binalood. Finally, to provide a better status of selected cities in terms of quantity and quality of all these indicators, they will be compared in three levels.

Table 11. Status of development of each city based on healthcare indicators in 2015

Row	Ranking	Development	Urban Areas	
			Name	Number
1	$0<x\leq0.5$	Relatively developed		
2	$0.5<x\leq0.7$	Developing	Taibad	1
3	$0.7<x$	Underdeveloped	Bardaskan and Binalood	2

From the table above it is clear that Taibad is developing but Bardaskan and Binalood, are underdeveloped.

DISCUSSION AND CONCLUSION

Results show the status of selected cities based on the ranking of the indicators of communicable and non-communicable diseases: Binalood is developing but Bardaskan and Taibad are underdeveloped. None of the selected cities in the province are in a high rank considering the development status. Binalud is in the middle while Bardaskan and Taibad are underdeveloped.

Evidence suggests that the more a person is in a lower socioeconomic status, their health status will be worse. So it can be said that throughout the world, there are differences in rates of disease among the disadvantaged group compared with other groups. The disadvantaged group is more diseased and the disability at younger age is more prevalent. For example, in Finland 42% of people who suffer from chronic diseases are among the lower income group [13].

In another study, Salehi et al studied the consumption of fruits and vegetables and related factors in elderly patients in hospitals in Zahedan province in Iran. The results showed that the consumption of fruit and vegetables of the studied elderly is very low [14].

A comparison between this study and the above study leads to the conclusion that due to the low rate of literacy and social and cultural level in the three cities as in the above study, the consumption of fruits and vegetables in the study by Salehi et al is low which is due to low education level and living in rural areas.

Results show the status of selected cities based on the ranking of the indicators of communicable and non-communicable diseases. Binalood is developing but Bardaskan and Taibad are underdeveloped. None of selected cities in the province are in a high rank considering the development status.

A study by Rafi'I et al in the first half of 2004 entitled "modeling the percent of occupancy rate of hospital beds in Shiraz" showed that the average rate was 66.4 which is consistent with the results of the presents study (average occupancy rate of hospital beds in selected cities 60.85) [15].

In a study by Sadeghirad et al. in 2008, entitled "assessing the indicators of rational prescription of medicines by the physicians in Kerman province in Iran" it was observed that the price of the visit by more experienced physicians was higher and the number of items prescribed by them was significantly less. The number of items prescribed by them (general practitioners and specialists) showed a significant difference and the number of items in the prescriptions by general medicine was more [16].

The number of items prescribed by General practitioners in the above study is consistent with the present study (average number of items prescribed in select cities was 3.2). This indicates the need for more attention to teaching

the principles of prescribing and taking into account the economic status of patients, and it is crucial to increase the quality and quantity of training programs. Similarly, by exerting efficient management and ongoing monitoring of prescribing patterns, rational prescription indicators can be monitored and controlled.

The results of these indicators show that the selected cities, in terms of enjoying the indicators of health care monitoring are not similar and are often not desirably developed, and the level of development are far from developed. It is apparent that among the various indicators of development, health care indicators play prominent role in maintaining public health. These indicators in the sample cities are very weak and far from the ideal indicators and balance. The higher quantity and quality of health indicators in a community, and more balanced and convenient distribution of the indicators lead to the relative prosperity and better health in the community.

Acknowledgement
Hereby, all officials, experts and scholars of Mashhad University of Medical Sciences and Health networks that helped us gather information are deeply appreciated.

REFERENCES

[1] Biravand Zadeh M,Sorkh Kamal K, alizadeh Sd, Shykh Eslami A. an analytical apporoach to davalopment ratio in north kharasan provice and its status in the Country. J Geo Sci. 2007-2008; Autumn & Winter(7-8): 100-23. (Persian)
[2] Amini N, Yadolahi H,Inanlu S. Health ranking in Iran provinces. welfare Quarterly, 2006; 5(20):27-48. (Persian)
[3] Rafiiyan M, Taajdaar V. Health status assessment in mashhad conurbation:A regional approach- J Geo & Reg Develop Res. 2008; Spring & Summer(10): 163-84. (Persian)
[4] Ghanbari S, Bazrafshan J, Jamalinejad M. Comparison and analysis level of development based on Itegrated Rural Development Srategy. Urban management 2012; Autumn& Winter(28):175-92. (Persian)
[5] Farhadian M, Mahjub H, Sadri GH, M .ranking health status of children in Irans P rovinces and assessing iys relation wwith soci-economic indicators. Hakim Research Journal, 2010;13(2):38-44. (Persian)
[6] Ghanbari A. Predict the degree of development and priority urban planning and development of Irans Provinces. Journal of Geography. 2011;9(29):165-179. (Persian)
[7] Zandian H, Qiasvand H, Nasimidoost R. measuring the rate of distributing the resources of Ardebil province. Health section for 2001-2008, by using Lorez curve and jayne coefficient. Ardebil, Iran: Ardebil University of Medical Sciences. 2011. (Persian)
[8] Ahmadi AM.Industrial Development and imbalances of Lorestan provivce regions.Lorestan province Management and Planning and Organization 2005. (Persian)
[9] Ebrahim Zadeh I, Raeispoor K.Review the trend of changed for development grade in rural areas of sistan&baluchestan by the use numerical taxonomy during the decades of 1996 and 2006,Geo Develop Iranian J. 2011; (24):51-76.(Persian)
[10] 10-Anjomshoa, M. Analysis of distribution of health services in the city of Yazd, Journal of Bioethics.2013;9. (Persian)
[11] Saraei M H,Kamaii Zadeh Y. Determine the degree of development of Yazd province in terms of access to health centers by using Morris. Journal of environmental planning, 2013;22: 64-80. (Persian)
[12] Bahrami, R. Analysis of the development of the health sector in Kurdistan province using linear Topsis. Journal, Geographic Information Studies, 2015;96. (Persian)
[13] Farshad, AA. Health Equity, Iran Occupational Health Journal, 2009;6(1).
[14] Salehi SH, Naji S.A, Sargazi M. The amount of fruit and vegetable intake and risk factors among elderly patients in hospitals in Zahedan, Iranian elderly J. 2011; 6(4): 30-36. (Persian)
[15] Rafiei M, Ayatollahi SMT, Behboodian J. Bed occupancy rate modeling in Shiraz hospitals ,The Journal of Qazvin Univ. of Med. Sci. Summer 2008; 12(2): 56-62. (Persian)
[16] Zareshahi R, Haghdoost AA, Asadipour A, Sadeghirad B. Rational Usage of Drug Indices in thePrescriptions of Kerman Medical Practitioners in 2008. J Rafsanjan Univ Med Scie 2012; 11(6): 523-36. (Persian)