



# Analyzing of regression model of environmental health quality of residential in slum areas

Ghasem Abedi, Farideh Rostami, Behzad Nikpor

International Journal of Collaborative Research on Internal Medicine & Public Health  
Vol. 4 No. 2 (February 2012)

## International Journal of Collaborative Research on Internal Medicine & Public Health (IJCRIMPH)

ISSN 1840-4529 | Journal Type: Open Access | Volume 4 Number 2

Journal details including published articles and guidelines for authors can be found at:

<http://www.iomcworld.com/ijcrimph/>

**To cite this Article:** Abedi G, Rostami F, Nikpor B. Analyzing of regression model of environmental health quality of residential in slum areas. *International Journal of Collaborative Research on Internal Medicine & Public Health*. 2012; 4(2):137-143.

**Article URL:** <http://iomcworld.com/ijcrimph/ijcrimph-v04-n02-06.htm>

Correspondence concerning this article should be addressed to Dr. Ghasem Abedi; Health Sciences Research Center, Faculty of health, Mazandaran University of Medical Sciences, Sari, Iran | Email: [hsrsari@gmail.com](mailto:hsrsari@gmail.com)

Paper publication: 17 February 2012

### International Journal of Collaborative Research on Internal Medicine & Public Health

#### ***Editors-in-Chief:***

Asst. Prof. Dr. Jaspreet S. Brar (University of Pittsburgh, USA)  
Forouzan Bayat Nejad

***Executive Editor:*** Mostafa Nejati

***Deputy Editor:*** Dr. Mensura Kudumovic (University of Sarajevo, Bosnia & Herzegovina)

## Analyzing of regression model of environmental health quality of residential in slum areas

Ghasem Abedi (1) \*, Farideh Rostami (2), Behzad Nikpor (3)

1) Health Sciences Research Center, Faculty of Health, Mazandaran University of Medical Sciences, Sari, Iran

2) Health Sciences Research Center, Mazandaran University of Medical Sciences, Sari, Iran

3) Health Sciences Research Center, Mazandaran University of Medical Sciences, Sari, Iran

\* Corresponding Author

### ABSTRACT

**Background & Objectives:** Study of cities development is the sign of disorganized and critical situation of residential health as one of the important policy issue of city development. Slum or marinated areas have high sensitivity against other residential places, because of their high population, lack of organic relation with city, and limitation in small places. The current study was conducted in three slum areas of the city of Sari, Iran, to measure the environmental health quality of slum places, and to determine their environmental health quality.

**Methods:** Hierarchical Multiple Regression Analysis (HMR) and namely, Analytic Hierarchy Process (AHP) method was used as the analytical technique for investigation and analysis of data.

**Results:** The results show that the health quality in the studied residences was in weak level ( $1 < 1.92 < 5$ ) and there were significant relationship between the criteria and sub- criteria in different levels with the variable of environment health quality of slums.

**Conclusion:** Preparation for constructing suitable urban residences as well as providing conditions to benefit from urban advantages in line with an enriched urban culture is of utmost importance.

**Keywords:** Regression model, quality, environment health, dwelling, slum area

### Introduction

Any city has a population peak and the target in urban planning is to meet the needs of that population. Development of city population has gotten proportional order in developed countries. But this case is not organized well in the developing world because of irregular emigration (1).

After the Second World War, rapid and uncoordinated trend of urbanization has been one of the most important social problems of the developing countries. Such inefficient urbanization process and consequently creation and development of suburban living places as a result of excessive inter emigrations from village to city to form new types of living (e.g. residing in huts, shanty dweller, tins and etc.) which caused various

socioeconomic and environmental problems (2). Article 25 - part 1 of the Universal Declaration of Human Rights defines health right as it follows:

*Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.*

According to this case and review of theoretical texts and surveys in the health care field, emphasis of all researchers is on "organic" hypothesis as a suitable and sufficient approach in evaluation of environment health quality in residential places. A qualified living site is suggestion of welfare feeling of living level and satisfactory of settler's life quality through physical- social facilities (3). So, quality of environment sanitary, result from resultant of quality of components of a determined area. These components include: nature, open space, foundation and artificial environments that each has its specifications and quality (4). There are different approaches to study the qualities of living environment each of which originates from a specific scientific discipline such as: anthropology, architecture, economy, environmental design, geography, psychology, sociology, and environment health engineering (5). According to the studies in the field of urban pathology to identify the weakness of processes of growth and urban development, it is widely agreed that the health condition of living areas is a separate product of this part (6). Hence, finding remedy to utilize effective solutions for decreasing harmful effects of development of such environments has been one of the most

important challenges to the urban managers and city programmers worldwide (especially in the developing countries) (7,8). The ability to comprehensively evaluate such settlements can help decision makers to come up with quality improvement plans for the environmental health of slum areas (9). But not much is known about the effectiveness of such plans, hence this study tries to tackle this gap looking at the three slum areas of the city of Sari, Iran, and measuring the environmental health quality of those places. Moreover, their environmental health quality has been determined according to the priority of unfair environmental component.

## Method

This study was carried out using Hierarchical Multiple Regression Analysis (HMR) method. This type of analysis is an analytical technique for investigation and analysis of reciprocal connection between one criterion having dependent criteria and two or more antecedents with independent criteria. Also, The Multiple Regression Analysis was applied for measuring the deviation of the independent variable. Two special specifications of Multiple Regression Analysis include estimation of "regression weights" and measuring the "goodness of fit model" for analysis of quality. In this survey, the independent variables were given a weightage. So, their proportional share was estimated in independent variable. The assigning if weightage to each independent variable was done according to its effect on the dependent variable. These numerical values are called "regression weights" or coefficients. After standardizing these weights, coefficients and determination of  $\beta$  coefficient and ranks of the dependent variables were compared with each other (10). The experimental model of the measuring of the residential places quality namely, "value tree" has hierarchical structure

that criteria, sub- criteria and effective criteria in process of measuring of the quality of the environmental health maintain different levels of the model (11). Also, amount of environment health quality which is proposed at minimum standard level is evaluated in two aspects of the environmental health quality of residential units and the environmental health quality. This model is described in four levels. In identifying the criteria/sub-criteria of the environmental health quality, different methods such as review of the related text/literature, primary identification of the studied area and obtaining the viewpoints of experts were used. Also, for arranging and developing the value tree of the environmental health, the "top to down" experimental approach was used. In this model, Quality of environmental health of residential places is placed at the first level of the tree. The second level is analyzed in two criteria of the environmental health quality of residential area and units. The third level is analyzed in six sub criteria, namely health of buildings and spaces, social cooperation and ties and place dependency, accessibility, physical-social facility, security, environment health variables and criteria of environmental health quality of the residential units analyzed in three sub criteria, maintains cost, outdoor facility and dwelling size and facility analyzed. Finally, the forth level of the model is divided into more sub- criteria of the third level that determined through the direct questionnaire method. Gathering of data at the level of 660 families of the three areas of sari (namely, Nowbonyad alley, Qaffari alley, and Tork mahaleh) was done in census method. For analysis of the data of residential places quality, the one-sample T-test and for comparing of the average score of the quality, the one-sample Kolmogorov-Smirnov Test, and for ranking of criteria and sub-criteria of the quality of the settler's health, the multi-variables regression analysis method were used.

## Findings

According to the quantity results of the questionnaire and one- sample T- test , average of the quality of environmental health of dwellings got  $1 < 1.92 < 5$  that there was a significant relation among four levels of the model with quality variable ( $p < 0.03$ ) (Figure 1).

To compare the mean score of the three places, the one-sample Kolmogorov-Smirnov Test was used. Data distribution in mentioned groups was normal ( $P < 0.04$ ). It was observed that the quality in *Tork mahaleh* was lower than the other two slum places. Therefore, quality in second level ( $1 < 1.92 < 5$ ) and third level ( $1 < 2.25 < 5$ ) evaluated weak (Table1).

For ranking of criteria and sub criteria's of the components of environmental health quality of residential areas, the Hierarchical Multiple Regression Analysis method was used. In this method, to determine the quality of effective variables (criteria and component of quality) that influence the residential health criteria, " $\beta$  "quality" at the second level was  $\beta = 0.3$  and  $\beta = 0.247$ , respectively. Also, among sub criteria's of environmental health quality, in mentioned places, the sub-criteria of "accessibility" with  $\beta = 0.186$  and among sub criteria's of environment quality of residential area, "size and outdoor facilities of residential unit" with  $\beta = 0.265$  had minimal importance (Table 2).

## Conclusion

As the study result indicated, the environmental health quality of residential places in the three studied region is about weak range ( $1 < 2.03 < 5$ ). Also in the second level, the environmental health quality of residential units is lower ( $1 < 1.9 < 5$ ) than the health quality of the residential area's

environment ( $1 < 1.94 < 5$ ). As for the sub-criteria belonging to the two criteria of residential unit and residential area's health quality, the highest quality levels are observed for access to the facilities ( $1 < 2.72 < 5$ ) and physical- social facilities ( $1 < 2.54 < 5$ ); whereas the lowest quality levels are observed for the size and indoor facilities of residential units ( $1 < 1.03 < 5$ ) and security and safety ( $1 < 1.71 < 5$ ). Also the ranking of components happening in different levels implies the higher significance of residential unit's environment health quality criterion ( $\beta = 0.360$ ) in comparison with environmental health quality of residential area ( $\beta = 0.247$ ). As for the sub criteria related to these two criteria, Size and outdoor facilities of residential unit with  $\beta = 0.262$  and Size and indoor facilities of residential unit with  $\beta = 0.224$  are the highest ones; whereas the security and safety ( $\beta = 0.154$ ) and social ties and place dependency with  $\beta = 0.158$  are the least significant ones.

So the size and indoor facilities of residential units and maintenance cost including: repairs, reconstruction, water, electricity & gas on environmental health quality residential units & also security & safety and social cooperation & place dependency on environmental health quality residential area are the most important components requiring serious intervention. The weak level of quality in all criteria & sub- criteria is significant and remarkable, therefore, the major actions to improve and promote the quality is necessary. As a result, planning to improve environmental conditions in a stable and holistic manner to increase health, security, hope, faith, and human generosity in the informal dwellings and to prevent the informal extension of such residential areas in future is of utmost importance; not to mention the importance of preparation for constructing suitable urban residences as well as providing conditions to benefit from urban advantages in line with an enriched urban culture to

accommodate such dwellings along with their multilateral participation in making decisions & local actions.

**Acknowledgment:** This study was supported by Vice-Chancellor for research; Mazandaran University of Medical Sciences and the authors are deeply indebted to slum dwellers in this city that helped us.

**Conflict of Interest:** None to declare

## References

1. Van Kamp I, Leidelmeijer K, Marsman G, de Hollander A. Urban environmental quality and human well-being towards a conceptual framework and demarcation of concepts: A literature study. *Landscape and Urban Planning*. 2003;65: 5-18.
2. Tu KJ, Lin LT. Evaluative structure of perceived residential environment quality in high-density and mixed-use urban settings: An exploratory study on Taipei City. *Landscape and Urban Planning*. 2008;87(3): 157-171.
3. Huchzermeyer M. From "contravention of laws" to "lack of rights": redefining the problem of informal settlements in South Africa. *Habitat International*. 2004;28(3): 333-347.
4. Sclar ED, Garau P, Carolini G. The 21st century health challenge of slums and cities. *Lancet*. 2005; 365(9462): 901-3.
5. Ge J, Hokao K. Research on residential lifestyles in Japanese cities from the viewpoints of residential preference, residential choice and residential satisfaction.

Landscape and Urban Planning. 2006;78(3): 165-178.

6. Abdul Mohit M, Ibrahim M, Rashid YR. Assessment of residential satisfaction in newly designed public low-cost housing in Kuala Lumpur, Malaysia. *Habitat International*. 2010;34(1): 18-27.

7. Westaway M. A longitudinal investigation of satisfaction with personal and environmental quality of life in an informal South African housing settlement, Doornkop, Soweto. *Habitat International*. 2006;30(1): 175-189.

8. Moreno EL, Warah R. The state of the world's cities report: urban slum trends in the 21st century. 2006. UN Chronicle online

edition.

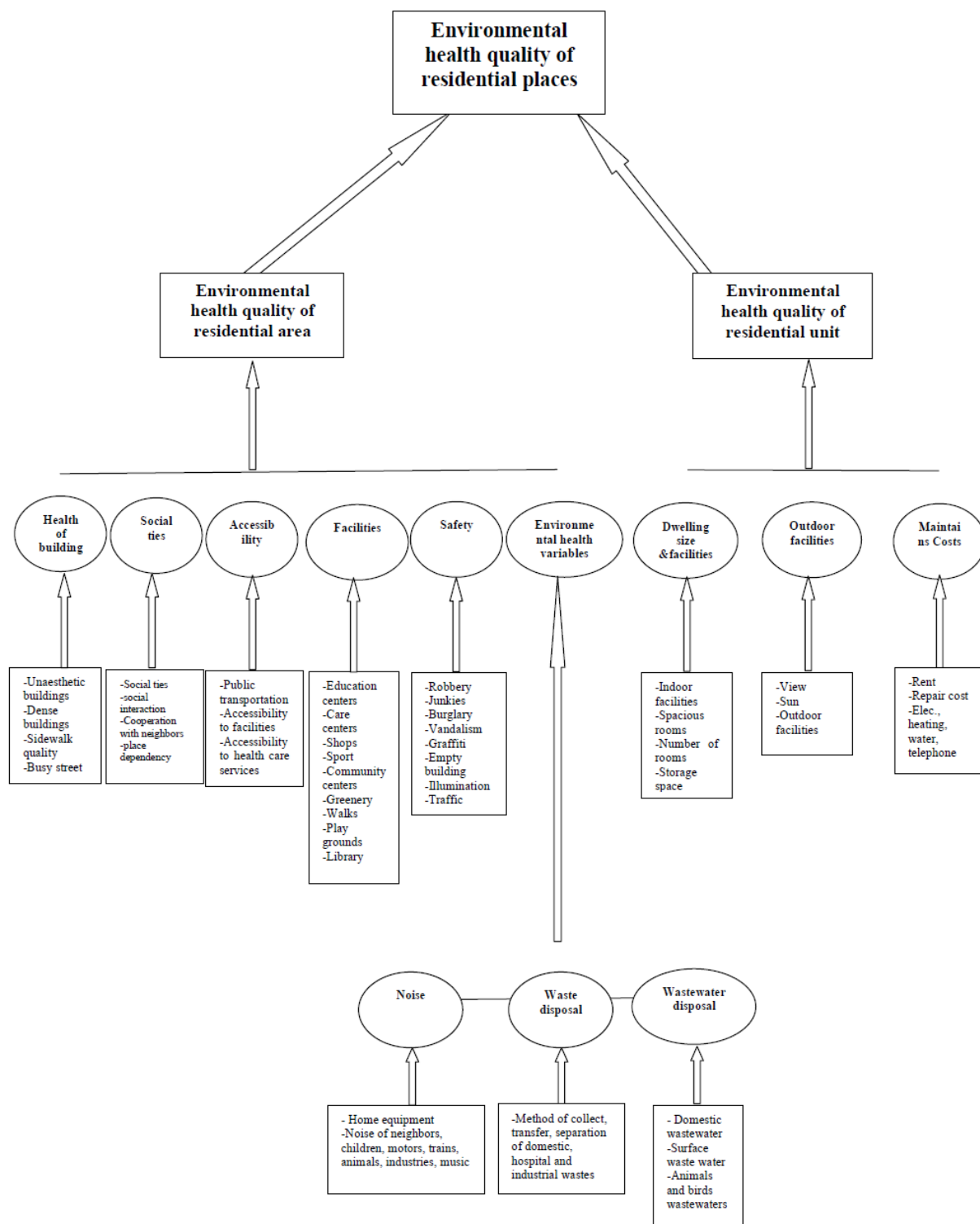
(<http://www.un.org/Pubs/chronicle/2006/issue2/0206p24.htm>, accessed on 10 August 2008).

9. Islam N, Mahbub AQM, Nazem NI, Lance P, Angeles G. Slums of urban Bangladesh: mapping and census 2005. Dhaka: Centre for Urban Studies. 2006: p. 54.

10. Poll RV. The perceived quality of the urban residential environment, a multi-attribute evaluation. Rijksuniversiteit Groningen. 1997: p. 21.

11. Varady DP, Preiser WFE. Scattered- site public Housing and Housing Satisfaction: Implications for the new Public Housing Program. *Journal of the American Planning Association*. 1998;64(2): 189-207.





**Figure 1:** The experimental model of residential environmental quality assessment "Value tree"

**Table 1:** Environmental health quality of residential unit as criteria and sub-criteria

First level	Second level	Quality of environmental health 1<mean<5	Third level	Quality of environmental health (1<mean<5)
Quality of environmental health	environmental health quality of residential unit	1.9	Size and indoor facilities of residential unit	1.03
			Maintain cost	2.64
			Size and outdoor facilities of residential unit	2.36
	environment health quality of the residential area	1.94	Accessibility	2.72
			Physical - Social facilities	2.54
			Social ties and interaction	1.78
			Security	1.71
			Environment variable	1.94
			Health of buildings	1.81

**Table 2:**  $\beta$  Coefficient of the importance of criteria and sub-criteria of environmental health quality of slums areas

0.212

First level	Second level	Beta( $\beta$ ) coefficients	Third level	Beta( $\beta$ ) coefficients
Quality of environmental health	environmental health quality of residential unit	0.3	Size and indoor facilities of residential unit	0.224
			Maintenance cost	0.212
			Size and outdoor facilities of residential unit	0.262
	environment health quality of the residential area	0.2	Accessibility	0.184
			Physical - Social facilities	0.173
			Social interaction and ties	0.158
			security	0.154
			Environment variable	0.165
			Health of buildings and spaces	0.162