

Emerging Health Issues in Megacities: An Analysis on Causes of Non-Communicable Diseases in Karachi

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Abstract:

The developing world is in the center of a considerable health evolution. In many developing communities, the persistent burden of infectious diseases is now coupled with the rising tide of non-communicable disease (NCD). NCDs are cause of 25% deaths in Pakistan. The objective of this study is to identify and analyze those factors that are cause of non-communicable disease in megacities. The study is based on exploratory analysis through data collected by household survey in Karachi. This household survey was conducted in 2015 for purpose of identifying problems of Karachi. Study reveals only 45.5% households are getting water which is fit for drinking. Logistic regression analysis concluded that 8.40 times increase in non-communicable diseases level with the rise in each unit of poor quality drinking water supplied. Rise in population due to immigration having impact of 6.76 times and inadequate drainage system having impact of 0.82 times with its rise by one time. Thus, the literature found that supply of poor quality drinking water causing diseases that are non-communicable. Beside this over burden of population due immigration is also having strong impact on non-communicable diseases.

Keywords: Non-communicable disease (NCD), Quality of Drinking Water, Quality healthcare.

1. INTRODUCTION

The today's developing world is in the middle of considerable health evolution. Most of developing nations bear the burden of infectious diseases with the alarming increase in non-communicable disease (NCD). Non-communicable - or chronic - diseases are diseases of long duration and generally steadily sequence or a disease that is non-infectious with progress slowly with the long period. The four main types of non-communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancer, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes (World Health Organization, 2013). According to current statistics of World Health organization, around 38 million people die every year due to NCD. The 70-80% deaths occur in low and middle-income countries (World Health Organization, 2014). The Deaths due to NCDs now far outnumber deaths due to communicable disease. According to WHO NCD Country Profiles 2014, Pakistan is currently facing the double Burden of Communicable (38%) and Non- Communicable Diseases (50%). The WHO country profile (2014) shows that in Pakistan 25.3% individuals had high BP, 19% had CVD diseases, 3% had diabetes, 6% had chronic respiratory diseases, 8% had cancers, 23% were tobacco smokers and 0.1% were alcohol consumers (World Health Organization, 2014). Furthermore, Diseases that cause the most deaths in Pakistan include cardio vascular disease (CVD) 25%, cancers 7% respiratory diseases 5%, diabetes 1%, injuries 8% other NCDs 8% (Agha Khan University, n.d.). Meanwhile, the productive workforce of the economy endures the most of NCDs; these diseases aggravate a significant economic cost on healthcare system of the societies at whole. NCDs are the emerging issue in megacities like Karachi for the public healthcare of the society. Karachi is the Pakistan's economic hub with 21.7 million populations representing all major ethnic groups. NCDs and injuries are amongst the top ten causes of mortality in Pakistan; approximately account for 25 percent of the total deaths (World Health Organization, 2014) The morbidity burden of non-communicable diseases can be seen from the facts that; one in three adults over the age of 45 years suffers from high blood pressure, and prevalence of diabetes is reported at 10 percent. In Low middle-income countries (LMICs) 80% of all death occurred due to NCDs (Global Status report on NCDs, 2012). According to the World Economic Forum, the estimated cost of NCDs around the globe in 2030 will be reached at the level of \$47 trillion. The report conferred that it will be a major threat to both the global health and the global economies during 21st century (Bloom DE, 2012). The availability of junk processed foods with unhealthy fats cheaply accessible in the market for consumers and attract them towards lazy lifestyle. However, overweight and obesity are on alarming level in developing world (Swinburn BA, 2011). Interactive risk factors to increase NCDs are due to rapid urbanization, economic transition and emerging lifestyle in Asian megacities (Ham, 1973). According to current statistics, more than 60% of the increase in the world's urban population over the next three decades will occur in Asia, where it will exceed 2.6 billion by 2030, and where 16 of the world's 24 megacities are found (McGee, 2001). The frequency of diabetes has climbed rapidly in South Asian countries than other part of world. Furthermore, the cardiovascular disease is already spreading highly in the world (King H, 1998).

1.1. Research Question

Q. What are the causes of non-communicable disease in Karachi?

1.2. Research Objective

The poor quality of drinking water, over burden of population due to immigration and inadequate drainage system are the major determinants that cause to increase the non-communicable disease in the Karachi city. According to Karachi Megacity Survey only 45.5% household in Karachi is getting water which fit for drinking. The objective of this study is to identify and analyze those factors that are cause of non-communicable disease in Karachi as megacity.

1.3. Research Hypotheses:

This research is based on exploratory analysis through data collected by household survey in Karachi. This household survey was conducted in 2015 for purpose of identifying problems of Karachi.

H₁: As supply of poor quality of drinking water increases the non-communicable disease increases.

H₂: As Over-burden of population due to immigration increases the non-communicable disease increases.

H₃: As Inadequacy of drainage, system increases the non-communicable disease increases.

1.4. Variables:

1.41. Dependent Variable

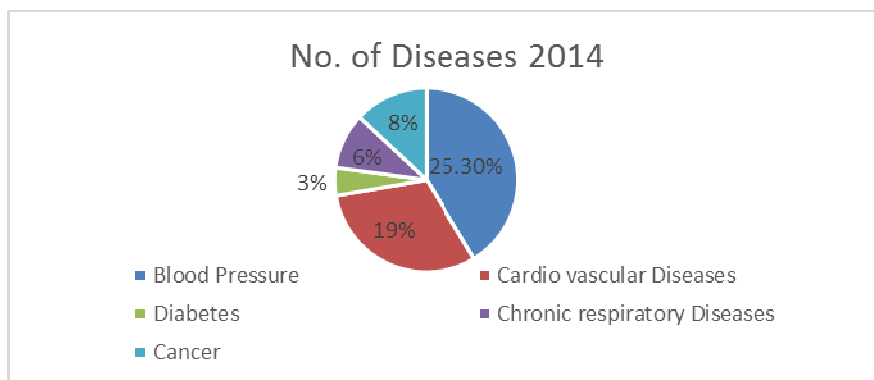
- Non-communicable diseases.

1.42. Independent Variables

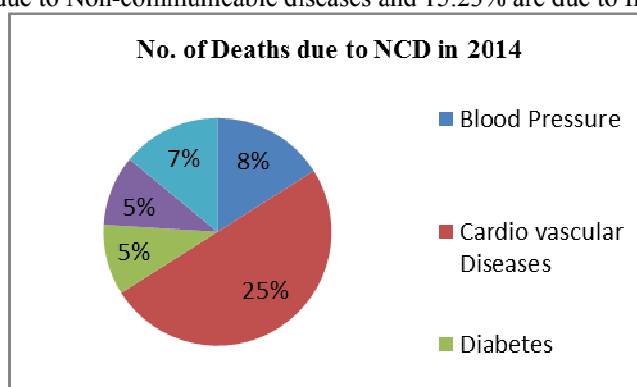
- Poor Quality Drinking Water
- Over Burden of Population due to immigration
- Inadequate drainage System

2.0. Empirical Evidence:

The rapid growth of several cities with development in formal sector is one of the major urban challenge in the 21st century. On-communicable diseases exhort a considerable toll on individuals, societies and health systems (World Health Organization, 2014). Non-communicable diseases normally cause in premature adult mortality, lifelong disability, shorter the life expectancy that put severe impact on healthcare system of the economy (Alwan, A., D. R. Maclean, et al, 2010). Located in South Asia, Pakistan has a population of more than 190 million and a per-capita health expenditure of US \$ 25 (World Health Organization, 2014). NCDs and injuries are amongst the top ten causes of mortality and morbidity in Pakistan. Karachi reports one of the highest incidences of breast cancer for any Asian population (Bhurgr H, Saqib Ali Gowani et al., 2008). In addition, estimates indicate that there are one million severely mentally ill and over 10 million individuals with neurotic mental illnesses within the country (Planning Commission of Pakistan, 2010). Throughout the last few years there has been a gradual shift from communicable to non-communicable diseases (NCDs) such as cardiovascular diseases (including stroke and heart disease), diabetes, mental health disorders, cancers, and chronic airway diseases (Jafar th, Haland BA, Rehman A, Razzak et al., 2013). A profound literature is available in the research world, which support the researcher objective of this study. Sharmeen Ameen in 2014, in his study found that quality and standard drinking water are essential for every human life. The study further concludes that contamination of drinking water is one of the severe problems faced in urban and rural areas of Pakistan (Ameen, 2014). Moreover, Zafar and Malik (2014) conclude in their study that Healthcare infrastructure for NCDs should be re-examine and rebuild entire health system from service provision to healthcare financing with improve management and performance monitoring (zafar M, Malik A , 2014). The Non-communicable diseases could be considered as infections that have cause in huge portion of lifestyle of people. However, a large part of NCDs are attributable to operational and upstream factors (Blackshaw, 2011). The study of Thakur (2011) highlight the social and economic implication of NCDs in India. The study revealed that NCDs in India account for an economic burden around 5- 10% of GDP of the country that is hampered economic development of the country. The study further concluded that health sector alone cannot tackle the “chronic emergency” of NCDs, however multi- sectorial action is required to strengthening the health system (Thakur, 2011). Gohari (2015) Found in their study the five leading causes of death in Tehran. The study exposed that Tehran is an emerging megacity with population of more than 8 million people which is further segregate into 22 districts. The study designed to recognize high or low risk clusters for five NCDs leading cause of death in 22 district of Tehran. The study conclude that all five causes have different distribution in different district of the city. They further revealed that this discrepancy might be shocking of inequality in healthcare facility provided in different district of the city (Gohari K, 2015).



The above table shows the causes of death in Pakistan. According to 2008 statistics, In Pakistan, around 54.38% disease are Non-communicable and 45.62% are communicable. The data revealed that 84.77% of total deaths are occurred due to Non-communicable diseases and 15.23% are due to Injuries.



3.0. Methodology

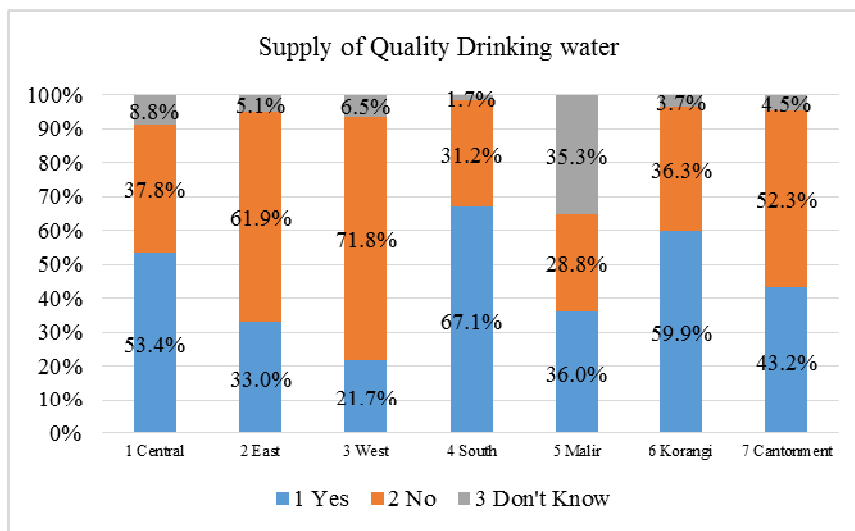
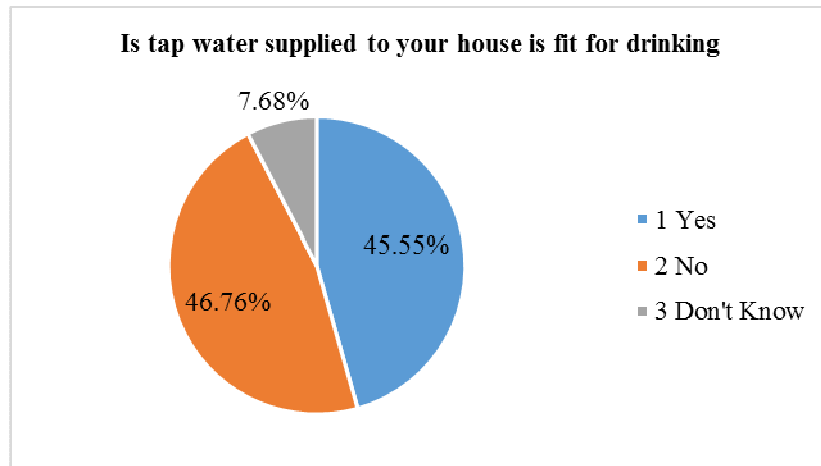
The city of Karachi was classified into stratum according to its 18 administrative towns and 6 cantonments areas. Each town and cantonment was divided into blocks and each block comprises of 200 to 250 households, on average; every town and cantonment has different blocks sizes based on their population as recorded in the 1998 census. According to the Pakistan Bureau of Statistic (PBS), Karachi has 13,233 blocks. A two stage stratified sampling was employed to draw sample. At first stage 1% blocks were selected through systematic random sampling after a random start.

4.0. Findings of Survey

Analysis showed more than 46% households are receiving drinking water, which is not fit for drinking.

Is tap water supplied to your house is fit for drinking	Frequency	Percent
1 Yes	907	45.55%
2 No	931	46.76%
3 Don't Know	153	7.68%
Total	1991	100.0

Source: Megacity Project Survey 2015-16

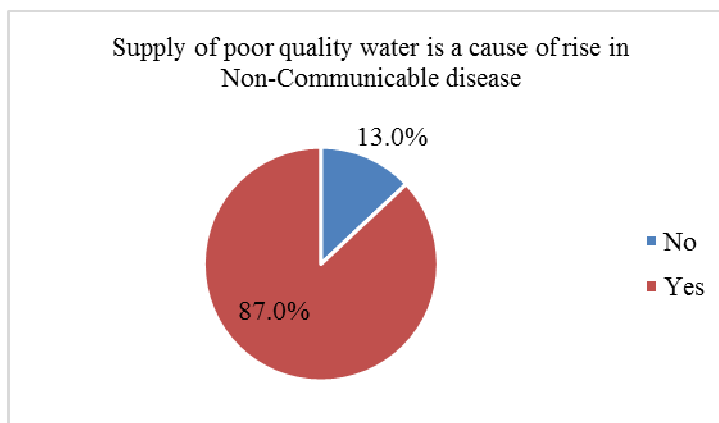


The above table shows the supply of quality of drinking water on district wise. According to survey result, the most of the resident of Central, South and Korangi district are satisfy of quality of drinking water supplied them that is 53.4%, 67% and 59.9% respectively. On the other hand, 62%, 72% and 52.3% resident of East, West and Cantonment respectively are not satisfying quality of drinking water supply them.

4.1. Bivariate Analysis

Bivariate analysis of Independent and Dependent Variables		Poor quality drinking water		Total
		No	Yes	
Rapid Increase in non-communicable diseases	No	84.0% (121)	13.0% (240)	18.1% (361)
	Yes	16.0% (23)	87.0% (1607)	81% (1630)
Total		100.0% (144)	100.0% (1847)	100.0% (1991)

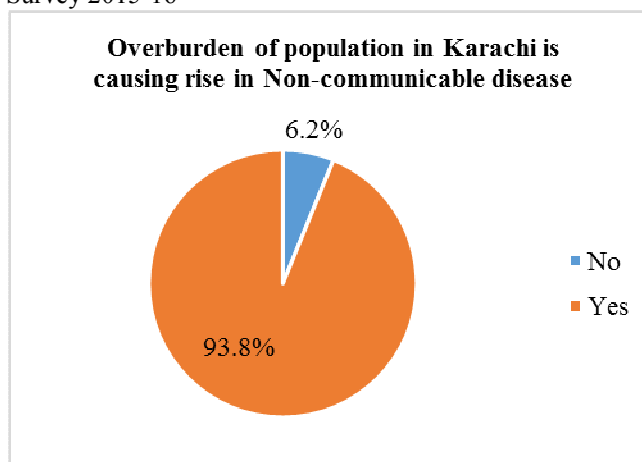
Source: Megacity Project Survey 2015-16



According to bivariate analysis of dependent and independent variables, the study found that 87% of survey respondent said The Supply of poor quality of water is the main cause that would increase the level of NCDs in the Karachi city.

Bivariate Analysis of Independent and Dependent Variables		Over burden of Pop. due to immigration		Total
		No	Yes	
Rapid Increase in non-communicable diseases	No	53.6% (269)	6.2% (92)	18.1% (361)
	Yes	46.4% (233)	93.8% (1397)	81% (1630)
Total		100.0% (502)	100.0% (1489)	100.0% (1991)

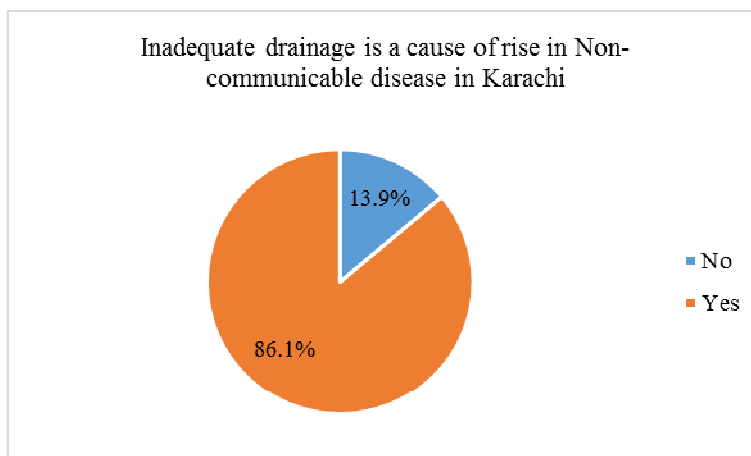
Source: Megacity Project Survey 2015-16



The bivariate analysis of over burden of population in Karachi, which is occurred due to immigrants and its impact on increasing volume of NCDs in Karachi showed almost 94% respondent understand that the increasing trend of NCDs is because of the overburden of population in Karachi.

Bivariate Analysis of Independent and Dependent Variables		Inadequate drainage system		Total
		No	Yes	
Rapid Increase in non-communicable diseases	No	63.5% (108)	13.9% (253)	18.1% (361)
	Yes	36.5% (62)	86.1% (1568)	81% (1630)
Total		100.0% (170)	100.0% (1821)	100.0% (1991)

Source: Megacity Project Survey 2015-16



The bivariate analysis of inadequate drainage system in Karachi and its impact on NCDs in the city result, 86% of respondents realize that inadequate drainage system is a major cause of NCDs in Karachi.

4.2. Logistic Regression

The logistic analysis is useful tool to analyze dichotomous data. It has three assumptions; firstly, the outcome must be discreet and the variables (Dependent and Independent) should be in the form of dichotomous. Secondly, the data should not have any outlier and thirdly, there is no multicollinearity between explanatory variable. All variables are recoded in the order of binary numbers (0,1) e.g. 0 = no Over Burden of Population due to immigration and 1 = Over Burden of Population due to immigration.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1203.235 ^a	.290	.474

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Step 1 ^a Variables in equation	Wald	df	Sig.	Exp (B)
Poor quality drinking water (1)	647.518	1	.000	8.40
Over Burden of Population due to immigration (1)	596.775	1	.000	6.76
In adequate drainage System (1)	6.754	1	.009	.82
Constant	1746.608	1	.000	.072

Logistic regression analysis shows impact of 8.40 times on non-communicable diseases with the rise in each unit of poor quality drinking water supplied. Rise in population due to immigration having impact of 6.76 times and inadequate drainage system having impact of 0.82 times with its rise by one time.

5.0 Conclusion

Poor Quality drinking water is causing more diseases that are non-communicable. Beside this over burden of population due immigration is also having strong impact on non-communicable diseases. People coming from different areas of Pakistan are not aware about health issues in Karachi. Especially, immigrants are more affected by non-communicable diseases because of poor quality of drinking water. Inadequate drainage is causing high impact beside poor quality drinking water and overburden of population. Cross tab analyses showed 93.8% immigrants are suffered from non-communicable diseases. 87% non-communicable diseases are caused by poor quality of drinking water and 86.1% due to inadequate drainage system in the city. District wise analyses showed 92.8% respondent perceived that non-communicable diseases are caused because of poor quality of drinking water. 74.8% perceived major cause is overburden of population due to immigration.

6.0. Recommendations for policy

- Government should launch campaign of awareness program to spread knowledge about health issues.
- Ensure supply of cleaned drinking water.
- Construct adequate drainage system in the city.
- Make sure the quality healthcare services in every district to handle immediately emerging healthcare issues.
- To cope up with emerging healthcare issues, media campaign is to be introduced.

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