

Changing Mortality Trends in Chandigarh, India

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Abstract

Objective: To find the causes of mortality and highlight its changing trend in the last two decades in Chandigarh, an urban city in North India.

Methods: The study was conducted by collecting the mortality data from District Registrar, Births and Deaths, Chandigarh from 1983 to 2002. Diseases were classified according to International Classification of Diseases 10th Revision (ICD-10).

Findings: The Mortality trends over the last two decades in Chandigarh have shown a decline in deaths due to Infectious and parasitic diseases from 18.7% to 9.5%, deaths due to respiratory diseases from 10.5% to 7.4%, and diseases of digestive system from 8.4% to 1.9%, while deaths due to circulatory diseases have increased significantly from 18.1% to 35.0%. These mortality trends have highlighted the advance of Epidemiological transition in this North Indian city, which reflects the percolation of lifestyle related risk factors in the general population.

Conclusion: As with other developing Countries, India is presently in the Epidemiological transition phase. Mortality risk factors include both poverty related risk factors as well as lifestyle related risk factors. Strategies should be developed for modifying rapidly changing life style behavior among residents of Chandigarh.

INTRODUCTION

Mortality statistics form an integral part of vital statistics. Mortality influences rate and growth of population and is an important factor for socio-economic and health planning of any country.¹

Data on the causes of death provide an important source of information on Death. Such data are crucial for monitoring the reasons why people die and for targeting where, when, and how health resources should be expended.

The most striking demographic phenomenon of the twentieth century has been a marked decline in the mortality rates accompanied by a dramatic rise in life expectancy, especially in the developed regions of the world. This decline was most pronounced in the 1960's, leading demographers to coin the term "mortality transition". The term describes essentially a state of high mortality, resulting from the high incidence of infections and parasitic diseases followed by a state of lower mortality, resulting from the successful control of communicable diseases. However, the mortality transition also suggests an epidemiological

transition with the burden of disease shifting from the 'age of pestilence and famine' to the 'age of degenerative and manmade diseases'.

Over the last five decades, the Asian region following global trends, has experienced a distinct pattern, with countries in earlier stages of development struggling to manage health-related mortality problems linked to poorer socio-economic conditions, as well as a new set of challenges posed by emerging health threats stemming from environmental and lifestyle changes. As Countries develop, the risk factors associated with mortality change. Poverty, insanitary conditions, poor nutrition and inadequate health facilities are the main causes of morbidity and resultant mortality along with rising affluence and changing lifestyles that have changed the disease profile of developing countries.²

Developing Countries like India are following mortality patterns already evident in the more developed and westernized countries, characterised by a rise in the numbers of people with non-communicable diseases such as Cardiovascular diseases, Diabetes mellitus and Cancer.

Dietary changes that include large amounts of saturated fats, sugars, and salt coupled with lower intake of dietary fiber found in fruits and vegetables are largely responsible for the higher incidence of heart diseases and cancer.³ Other lifestyle related factors affecting health status and therefore mortality rates in developing countries are lack of exercise and inactivity. A sedentary lifestyle, however is more prevalent among urban dwellers in contrast to those living in rural communities.⁴

This transition in disease trend is also characterised as the 'diseases of affluence and lifestyle' or 'diseases of development', identified as Cancer, Hypertension, Diabetes mellitus, heart and respiratory diseases and trauma leading to construction of the concept of the 'new public health' which has to deal with new challenges associated with increasing longevity, over population, increasing industrialization and industrial decline, inequities in health, environmental damage and ecological imbalance.

Nevertheless, it is acknowledged that infectious diseases in particular, HIV/AIDS, Dengue fever, TB and Malaria will continue to pose a challenge.⁵

The present study was undertaken with the objective to bring out the causes of mortality and highlight its changing trend, if any, over the last 2 decades in Chandigarh.

MATERIAL AND METHODS

The study was conducted by collecting the mortality data from the District Registrar, Births and Deaths, Chandigarh for the years 1983, 1992 and 2002. Classification of causes of death was done according to the International Classification Diseases 10th revision (ICD-10). The tenth revision, which became effective in 1999, categorizes deaths into seventeen broad categories

A total of 4435 deaths were recorded in the death register for the year 1983, out of which complete information was available for 3680 (83%) only. In 1992, a total of 5044 deaths were recorded and complete information was available for 3794 (74%) only. For the year 2002, 8844 deaths were registered, out of which 4239 individuals were residents of Chandigarh and 4483 were residing out of Chandigarh. Address records of 122 deaths were not available. Statistical analysis was done using the Z – test.

RESULTS AND DISCUSSION

In the mortality trends in Chandigarh for the last 2 decades 1983- 2002 ,(Table- 1) it was observed that deaths due to

infectious and parasitic diseases have decreased from 18.7% to 9.5% ($Z=14.35$; $p < 0.001$) followed by respiratory diseases having declined from 10.5% to 7.4% ($Z=5.79$; $p < 0.001$) and diseases of the digestive system that have shown a decline from 8.4% to 1.9% ($Z=16.92$; $p < 0.01$).The decline in mortality due to Infectious and parasitic diseases is explained by improvements in sanitation, socio-economic development, advances in health care delivery services and better accessibility to preventive and curative services.

Figure 1

Table 1: decadal mortality trends in chandigarh (1983-2002).

S.No.	CAUSE OF DEATH	1983	1992	2002
		N=3680 (%)	N=3794 (%)	N=8844 (%)
1.	Certain Infectious and parasitic diseases (A00-B99)	688 (18.7)	466 (12.3)	845 (9.6)
2.	Diseases of Circulatory system (I00-I99)	666 (18.1)	1183 (31.2)	3102 (35.0)
3.	Diseases of Respiratory system (J00-J99)	388 (10.5)	223 (5.9)	659 (7.4)
4.	Injury, poisoning and certain other consequences of external causes (S00-T98), other external causes of accidental injury (WE00-X59)	360 (9.8)	394 (10.4)	299 (3.3)
5.	Diseases of Digestive system (K00-K93)	310 (8.4)	110 (2.9)	172 (1.9)
6.	Certain conditions originating in perinatal period (P00-P96)	223 (6.1)	75 (2.0)	250 (2.8)
7.	Diseases of Nervous system and sense organs (G00-G99)	178 (4.8)	83 (2.2)	114 (1.3)
8.	Diseases of Genito-urinary system (N00-N99)	169 (4.6)	68 (1.8)	83 (0.9)

Figures in parenthesis indicate percentages

However, deaths due to diseases of circulatory system have increased remarkably from 18.1% to 35.0% ($Z=20.9$; $p < 0.01$). This increase in mortality due to cardiovascular causes is significant and highlights the change in lifestyle from active to sedentary, dietary changes along with stress associated with modern living. A study on diet change in China reveals that during the last half century, there has been a rapid shift towards a pattern of food consumption linked with a high risk of non-communicable diseases.⁷

Between 1989 and 1998, the percentage of people consuming a high fat diet has increased from 14% to 38%.

Similar findings have been reported in Japan and Singapore also. According to WHO reports⁸, six of nine major risk factors of mortality among men in Japan and Singapore are related to substance abuse (Tobacco and excessive alcohol consumption). Other major risk factors that have been enumerated for the increase in Non-communicable diseases include physical inactivity and air-pollution.

The total number of deaths reported in Chandigarh during the year 2002 were 8844 (males=5640; females=3204).

Among the leading causes of mortality (Table-2) it was observed that mortality was highest due to circulatory system diseases (35.0%). Similar findings have been reported by Rohina et al⁹(32%) in Andhra Pradesh, India. This is followed by Symptoms, signs and abnormal clinical and laboratory findings not classified elsewhere (19.3%), infectious and parasitic diseases (9.5%), diseases of Respiratory diseases (7.4%), Injury, poisoning and certain other consequences of external causes (3.4%).

Figure 2

Table 2: Total Deaths In Chandigarh (2002)

S.No.	CAUSES OF DEATH ACCORDING TO ICD-10	MALE	FEMALE	TOTAL
1.	Certain infectious and parasitic diseases(A00-B99)	553(9.8)	292(9.1)	845
2.	Neoplasms(C00-D48)	83(0.96)	70(2.1)	153
3.	Diseases of blood and blood forming organs and certain disorders involving the immune mechanism(D50-D89)	12(0.21)	10(0.31)	22
4.	Endocrine, Nutritional and Metabolic Diseases(E00-E90)	52(0.92)	48(1.4)	100
5.	Mental and Behavioral disorders(F00-F99)	02(0.03)	01(0.03)	03
6.	Diseases of Nervous system(G00-G99)	66(57.9)	48(1.4)	114
7.	Diseases of the circulatory system(I00-I99)	2012(35.6)	1090(34.0)	3102
8.	Diseases of the respiratory system(J00-J99)	451(7.9)	208(6.5)	659
9.	Diseases of the digestive system(K00-K93)	114(2.0)	58(1.8)	172
10.	Diseases of the skin and subcutaneous tissue(L00-L99)	04(0.07)	-	04
11.	Diseases of the musculoskeletal system and connective tissue(M00-M99)	04(0.07)	04(0.12)	08
12.	Diseases of the genitor-urinary system(N00-N99)	55(0.97)	28(0.8)	83
13.	Pregnancy, childbirth and puerperium(O00-O99)	01(0.01)	14(0.4)	15
14.	Certain conditions originating in the perinatal period(P00-P96)	167(2.9)	83(2.5)	250
15.	Congenital malformations, deformations and chromosomal abnormalities(Q00-Q99)	14(0.24)	05(0.1)	19
16.	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	932(16.5)	778(24.2)	1710
17.	Injury, poisoning and certain other consequences of external causes(S00-T98)	216(3.8)	83(2.6)	299
18.	External causes of morbidity and mortality(V01-Y98)	199(3.5)	37(1.1)	236
19.	Other external causes of accidental injury(W00-X59)	121(2.1)	66(2.06)	187
20.	Complications of medical and surgical care(Y40-Y84)	03(0.05)	02(0.06)	5
21.	Ill defined/ cause not mentioned/brought dead	579(10.2)	279(8.7)	858
	Total	5640(63.8)	3204(36.2)	8844

On further analysis, it was seen that the mortality rate among males is higher as compared to females in case of deaths due to Respiratory system diseases ($Z=2.5$; $p < 0.01$), Injury, poisoning and other consequences of external causes ($Z=3.3$; $p < 0.001$) and external causes of morbidity and mortality ($Z=8$; $p < 0.001$).

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Injury, poisoning and other consequences of external causes ($Z=3.3$; $p < 0.001$) and external causes of morbidity and mortality ($Z=8$; $p < 0.001$).

However, mortality was more in females due to neoplasm's ($Z=4.07$; $p < 0.001$), and endocrinal, nutritional and

metabolic diseases ($Z=2.0$; $p < 0.01$).

The rural – urban differences in causes of mortality revealed that deaths due to Infectious and parasitic diseases, Diseases of respiratory system and Diseases of Digestive system were higher in rural areas as compared to urban areas. It was also observed that deaths due to Diseases of circulatory system were more in rural areas (37.2%) as against 31.0% in urban areas.

No significant rural-urban differential in deaths among residents of Chandigarh was observed except for diseases of circulatory system. This may be due to the fact that the rural and urban residents of Chandigarh enjoy almost same life style pattern and also do not vary much in exposure to risk of mortality due to other factors leading to death.

Figure 3

Table 3: Rural-Urban Differences In Mortality Trends Among Residents Of Chandigarh (2002)

S No.	CAUSES OF DEATH ACCORDING TO ICD-10	RURAL No. (%)	URBAN No. (%)	TOTAL NO. (%)
1.	Certain infectious and parasitic diseases(A00-B99)	54(10.4)	282(7.5)	336(7.0)
2.	Neoplasms(C00-D48)	09(1.7)	129(3.5)	138(3.3)
3.	Diseases of blood and blood forming organs and certain disorders involving the immune mechanism(D50-D89)	06(1.2)	11(0.3)	17(0.4)
4.	Endocrine, Nutritional and Metabolic Diseases(E00-E90)	07(1.3)	50(1.3)	57(1.3)
5.	Mental and Behavioral disorders(F00-F99)	-	01(0.02)	01(0.02)
6.	Diseases of Nervous system(G00-G99)	10(1.9)	40(1.07)	50(1.2)
7.	Diseases of the circulatory system(I00-I99)	193(37.2)	1154(31.0)	1347(31.8)
8.	Diseases of the respiratory system(J00-J99)	48(9.2)	245(6.5)	293(6.9)
9.	Diseases of the digestive system(K00-K93)	14(2.7)	66(1.8)	80(1.9)
10.	Diseases of the skin and subcutaneous tissue(L00-L99)	01(0.2)	01(0.02)	02(0.1)
11.	Diseases of the musculoskeletal system and connective tissue(M00-M99)	-	07(0.2)	07(0.2)
12.	Diseases of the genitor-urinary system(N00-N99)	06(1.2)	26(0.7)	32(0.8)
13.	Pregnancy, childbirth and puerperium(O00-O99)	03(0.6)	10(0.3)	13(0.3)
14.	Certain conditions originating in the perinatal period(P00-P96)	15(2.9)	76(2.0)	91(2.1)
15.	Congenital malformations, deformations and chromosomal abnormalities(Q00-Q99)	-	03(0.1)	03(0.07)
16.	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	86(16.6)	1124(30.2)	1210(28.5)
17.	Injury, poisoning and certain other consequences of external causes (S00-T98)	10(1.9)	40(1.1)	50(1.2)
18.	External causes of morbidity and mortality(V01-Y98)	10(1.9)	125(3.4)	135(3.2)
19.	Other external causes of accidental Injury(W00-X59)	13(2.5)	82(2.2)	95(2.2)
20.	Complications of medical and surgical care(Y40-Y84)	-	02(0.05)	02(0.1)
21.	Ill defined/ cause not mentioned/brought dead	34(6.5)	246(6.6)	280(6.6)
	Total	519(12.2)	3720(87.7)	4239(100.0)

CONCLUSION

Similar to the experience of other developing countries,

India also finds itself in the epidemiological transition. As a result, major risk factors of mortality include both poverty-related risk factors and lifestyle-related risk factors. These countries have to deal with the double burden of solving poverty as well as lifestyle-related risk factors in the future. Efforts to reduce undernourishment among the poor and promote healthy eating habits among the economically better off segment should be high on the public health agenda. Lowering the common risk factors such as tobacco, and alcohol use, controlling high blood pressure, high cholesterol levels, increasing intake of fruits and vegetables, better physical activity and practice of safe sex will result in improvements in health conditions and a reduction in mortality in the near future. Strategies should be developed for modifying rapidly changing life style among residents of Chandigarh.

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