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Original Research Article

Dynamics of chronic diseases in metro and non-metro regions of India: evidence from India Human Development Survey I and II

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ABSTRACT

Background: The growth of metropolitan cities had significantly contributed to the process of urbanization in India. About two-fifth of the urban population, out of total India's urban population, live in 35 metropolitan cities. It is important to look into the disease dynamics in the population of metro and non-metro regions of India. The study aims to find the differences in the distribution of chronic diseases in metro and non-metro regions of India and depicts the contributions of background factors causing a change in the prevalence of chronic diseases in metro and non-metro regions of India.
Methods: Data from India Human Development Survey (IHDS) I and II conducted in 2004 and 2012 respectively have been used. Bivariate analysis has been performed to find the association between independent variables and chronic diseases, and logistic regression has been used to find the effect of predictor variables on chronic diseases by metro and non-metro regions. Fairlie decomposition technique has been used to find the contribution of each predictor variable accounting for differences in chronic diseases between metro and non-metro regions.
Results: Age, sex, socio-economic status (education and wealth), alcohol consumption, tobacco consumption, and body mass index status are significantly associated with chronic conditions in metro regions of India. Age, wealth, and developed regions contributed most to the differences in chronic diseases between metro and non-metro areas.
Conclusions: Metro regions in India suffers from a massive burden of chronic conditions. Metro regions should be given a special focus to tackle the menace of chronic diseases.

Keywords: Decomposition, Chronic condition, India, Metro regions

INTRODUCTION

Urbanization is the prime phenomenon currently visible in the Indian scenario. The rapid growth of industries and the phenomenon of globalization acted as a fuel to urbanization in India. Percent Urban has increased from 11 percent in 1901 to 31 percent in 2011.[1] The process of globalization in the 1990s has played a significant role in catalysing the speed of urbanization in India.[2,3] The growth of metropolitan cities had significantly contributed to the process of urbanization in India. About two-fifth of the urban population, out of total India's urban population, live in only 35 metropolitan cities.[2]

The effect of urbanization on the health is two-edged. On the one hand, there are the benefits of ready access to healthcare, sanitation, and secure nutrition, while on the other, there are the evils of overcrowding, pollution, social deprivation, crime, and stress-related illness.[4] The major drawback of rapid urbanization is that it paves the way to the burden of chronic diseases too. Lifestyle and dietary factors, which are by-product of the urbanization, pose a great challenge and contribute most to the burden of chronic diseases.[5,6] Patterns of urban growth in the present and future, combined with advances in the treatment technology, will cause a shift of the burden of diseases from communicable to non-communicable diseases.[7]

Heavy congestion in metro cities is a significant obstacle in access to health care services. Moreover, an increase in motor vehicles and inadequate infrastructure may increase the level of air pollution and road accidents, respectively. It is also observed that obesity is already emerging as a significant risk.[7] One of the previous studies reported that in Bengaluru, the prevalence of chronic conditions was 12 percent, with hypertension and diabetes being the most common conditions.[8] The study further found that older people, women, and people from below poverty line were more likely to suffer from chronic diseases.[8] Earlier research shows that there are significant disparities in health, provision for health care, and housing conditions between the poorest quartile and the rest of the population in urban areas in India.[9]

Similarly, a study states that urban characteristics like dilapidated housing and inadequate access to health care, in turn, are associated with concentrated poverty in cities. [10] Many cities experience sharp disparities in wealth between relatively proximate neighbourhood, which are related to inequalities in availability and quality of health care utilization.[10] Socio-economic status (SES) assessed by income, education and occupation is associated with a wide range of health problems, including cardiovascular diseases, hypertension, and diabetes.[11] Lower SES is associated with high mortality and morbidity.[11] One of the previous studies argued that earlier infectious diseases were widespread in developed and developing countries.[12] With the rapidly growing populations, air pollution and accidents, sedentary lifestyles, the rise in obesity and diabetes, ultimately resulted in the growing menace of life-threatening diseases in the urban arena and the condition is worse than non-urban areas.[12]

There are many life-styles and dietary risk behaviours which are the entailments of urbanism that are associated with chronic conditions. One of the studies carves out the fact that unhealthy life-style involving tobacco use, lack regular physical activity, consumption of diets rich in highly saturated fats, sugars, and salt, typified by fast foods are highly associated with chronic diseases.[13] Obesity caused by an unhealthy diet is one of the prime factors for the occurrence of chronic disease in a population in general and the urban population in particularly.[14,15]

There is the paucity of studies focusing on the dynamics of chronic diseases in metro and non-metro regions of India. Therefore, the present study tries to investigate the factors contributing to the residential gap of chronic diseases in the metro and non-metro regions of India.

METHODS

Sample selection

We have not filtered our data that is we did our analysis on whole sample. We bifurcated the data into two parts that is in metro and non-metro regions of the country. The total sample size of the IHDS-I and IHDS-II are 215754 and 204568, respectively. The sample was thus distributed accordingly comprising of 196,497 and 186,574 respondents in non-metro regions and 19,257 and 17,995 respondents in metro region of India in 2004-05 and 2011-12 respectively. Moreover, we did our analysis for chronic diseases as an outcome variable. Therefore, again the data was bifurcated for respondents having chronic diseases or not for non-metro and metro regions respectively.

Type of study

India Human Development Survey is a longitudinal data but we have used it in a cross-sectional manner to fulfil our aims and objectives.

Data source

Data from Indian Human Development Survey I and II (IHDS I and II) carried out in 2004 and 2012, respectively have been used for the analysis. The India Human Development Survey (IHDS) is a nationally representative, the multi-topic survey of 41,554 households in 1503 villages and 971 urban neighbourhoods across India in 2004-05. The first round of interviews was completed in 2004-05, and the second round of IHDS re-interviewed most of these households in 2011-12 (N=42,152). Six cities namely Mumbai, Delhi, Kolkata, Chennai, Bangalore and Hyderabad are clubbed as metro cities in both the rounds of IHDS. Metropolitan areas were defined as any district included in the census definition of “urban conglomerates” for each of these six areas.[16]

The IHDS administered two sets of questionnaires: a household economic questionnaire and a health and education questionnaire. The household economic questionnaire was administered to the individual having good piece of knowledge and information of household income and expenditures, typically, the male head of the household. Living arrangement variable is constructed from the household roster. Health information, including questions on short-term illnesses of any family members

in the last 30 days, were collected in the education and health questionnaire, typically administered to the wife of the household's head. Some differences in reporting of illness were observed between older women and their daughters or daughters-in-law; to adjust for this potential difference, we include the identity of the respondent as a control variable.

Measurements

Variable description.

Dependent variable

Diabetes, high blood pressure, and heart diseases, which were self-reported in IHDS data in both rounds of survey i.e., 2004 and 2012, are clubbed into variable named chronic diseases coded as 0 and 1.[17] Six cities, which include Mumbai, Delhi, Kolkata, Chennai, Bangalore, and Hyderabad, are clubbed as metro cities in both rounds of IHDS.

Independent variables

Background and behavioural factors are taken into consideration to assess their effects on chronic conditions among people from the metro and non-metro regions of India. The categorization of independent variables are as age (<60 and ≥60 years), sex (male and female), caste (deprived - scheduled caste (SC) and scheduled tribes (ST) and non-deprived- other than SC and ST), religion (Hindu, Muslim, Christian, and others), educational status (illiterate, primary completed, secondary completed, higher secondary completed and graduate and above), wealth quartile (Q1, Q2, Q3, Q4, and Q5) Q1 as poorest, Q2 as poorer, Q3 as middle, Q4 as richer and Q5 as richest. The regions of India are classified as less developed and more developed; eighteen less developed states include eight empowered action group states (Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Uttaranchal, Odisha, and Rajasthan), eight north-eastern states (Assam, Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Nagaland, Sikkim, Tripura), Himachal Pradesh and Jammu and Kashmir (government of India, 2010). Tobacco consumption (yes or no), alcohol consumption (yes or no), BMI (underweight - <18.5, normal - 18.5 to 24.9, overweight - 25 to 29.9 and obesity - 30 and above).

Statistical analysis

Bivariate analysis has been performed to find the association between independent variables and chronic diseases by metro and non-metro regions of India. Logistic regression has been used to find the effect of predictor variables on chronic diseases by metro and non-metro regions. To assess the results from simple logistic regression, outcome variables was recoded in binary form i.e., coded in 0 and 1. Now to find the contribution of each predictor variable, which accounts for differences in chronic diseases between metro and non-metro regions, the Fairlie decomposition technique has been used. Before the invent of Fairlie decomposition, the Blinder-Oaxaca decomposition technique was used for identifying and quantifying the separate contributions of group differences in measurable characteristics, such as education, experience, marital status, and geographical location, to racial and gender gaps in outcomes. The technique is easy to apply and only requires coefficient estimates from linear regressions for the outcome of interest and sample means of the independent variables used in the regressions. A problem arises, however, if the outcome is binary i.e., coded in 0 and 1, such as employment, college attendance, or teenage pregnancy, and the coefficients are from a logit or probit model. These coefficient estimates cannot be used directly in the standard Blinder-Oaxaca decomposition equations.[18] A relatively simple method of performing a decomposition that uses estimates from a logit or probit model was first described in Fairlie's decomposition analysis of the causes of the black/white gap in self-employment rates. The non-linear decomposition technique may be useful for identifying the causes of racial, gender, geographical, or other categorical differences in a binary outcome.[19]

RESULTS

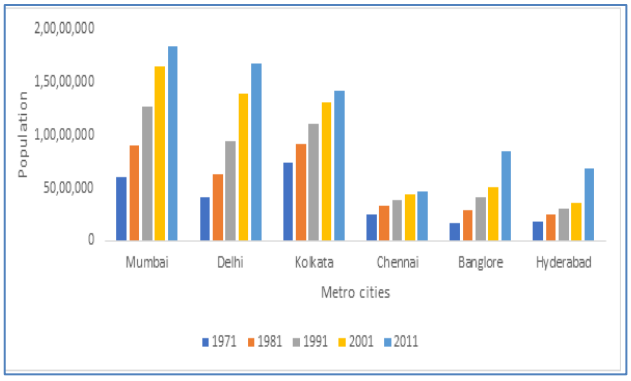

Figure 1: Population increase in six metro cities of India from 1971-2011.

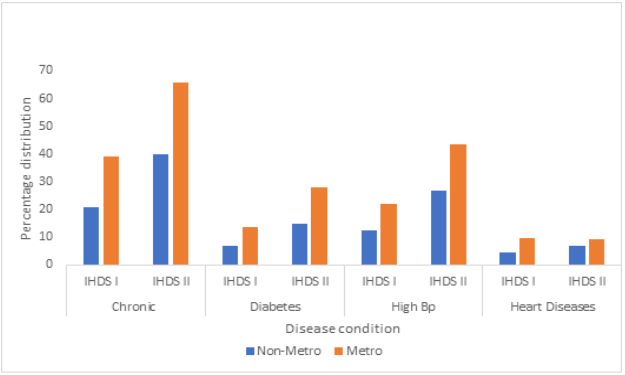

Figure 2: Percentage distribution of selected chronic conditions among people in metro and non-metro regions of India, IHDS-I and IHDS-II.

Figure 1 shows the graph for trends of the population in six metropolitan cities of India from 1971-2011. The population in all the six metropolitan cities (Mumbai, Delhi, Kolkata, Chennai, Bangalore, and Hyderabad) has been increasing at a high pace from 1971 to 2011.

Figure 2 shows the graph depicting chronic disease conditions in metro and non-metro cities. The graphs depict that all the diseases (chronic diseases, diabetes, high blood pressure, and heart diseases) have a significant preponderance in the metro cities in both the datasets. A drastic increase in chronic and high blood pressure can be noticed in metro cities from IHDS-I to IHDS-II.

Table 1 presents the profile of the population in metro and non-metro regions in India. In both IHDS-I and II, the majority of the respondents were ≤60.

Table 1: Percentage distribution of background characteristic by metro and non-metro regions in IDHS I and II, India.

Background characteristics	IHDS I (n=215, 754)		IHDS II (n=204, 568)	
	Non-metro	Metro	Non-metro	Metro
Age (years)				
>60	91.7	92.4	89.1	90.1
≤60	8.4	7.6	10.9	10.0
Sex				
Male	50.6	51.7	49.6	50.5
Female	49.4	48.4	50.4	49.5
Caste				
Deprived class	29.5	26.7	30.1	27.4
Non-deprived class	70.5	73.3	69.9	72.6
Religion				
Hindu	81.1	82.6	81.4	82.2
Muslim	12.9	13.1	13.2	13.9
Christian	2.4	1.6	2.1	1.7
Others	3.7	2.7	3.3	2.2
Educational status				
Illiterate	40.7	28.2	35.3	24.3
Primary completed	23.8	21.7	21.8	18.0
Secondary completed	26.1	32.3	29.4	33.8
Higher secondary completed	5.8	8.7	8.6	13.3
Graduate	3.6	9.1	4.9	10.6
Wealth quantile				
Poorest	23.7	6.4	24.3	14.2
Poorer	21.9	16.8	22.5	13.6
Middle	20.3	17.6	19.9	16.7
Richer	18.3	26.4	17.9	23.5
Richest	15.8	32.8	15.3	32.0
Regions				
Less developed states	55.3	4.2	56.5	4.5
More developed stated	44.7	95.8	43.5	95.5
Tobacco consumption				
No	84.3	89.3	83.6	87.0
Yes	15.7	10.7	16.4	13.0
Alcohol consumption				
No	95.0	95.6	94.0	94.5
Yes	5.0	4.4	6.0	5.5
BMI				
Underweight	22.3	15.1	31.4	19.2
Normal	11.5	12.9	28.5	31.3
Overweight	2.0	4.3	6.5	10.1
Obese	1.1	1.8	2.7	3.8
Missing[+]	63.1	65.9	30.9	35.7

[+]Missing values are system missing values, taken into consideration so that logistic regression can run on full sample.

Table 2: Rate of chronic diseases per 1000 population by background characteristics in metro and non-metro regions of India, IHDS 2004 and 2012.

Background characteristics	IHDS I (n=215, 754)			IHDS II (n=204, 568)		
	Non-metro (n=194, 653)	Metro (n=21, 101)	P value <0.05	Non-metro (n=184, 000)	Metro (n=20, 568)	P value <0.05
Age (years)						
>60	14	26	*	26	44	*
≤60	91	203	*	153	260	*
Sex						
Male	18	41	*	34	58	*
Female	24	37	*	45	74	*
Caste						
Deprived class	12	38	*	23	54	*
Non-deprived class	25	39	*	47	70	*
Religion						
Hindu	20	42	*	38	68	*
Muslim	20	19		45	56	
Christian	55	64		79	103	*
Others	19	32	*	54	37	*
Educational status						
Illiterate	19	41	*	39	78	*
Primary completed	18	35	*	38	51	*
Secondary completed	23	35	*	41	69	*
Higher secondary completed	22	29	*	32	43	*
Graduate	37	70	*	58	82	*
Wealth quantile						
Poorest	6	10	*	31	67	*
Poorer	13	28		30	47	*
Middle	17	17		34	65	*
Richer	26	41		48	67	*
Richest	52	61	*	67	72	
Regions						
Less developed states	13	21		29	60	*
More developed stated	31	40	*	54	66	*
Tobacco consumption						
No	19	39	*	37	60	*
Yes	29	39	*	54	104	*
Alcohol consumption						
No	21	39	*	39	63	*
Yes	24	36		49	123	*
BMI						
Underweight	3	23		10	13	
Normal	18	21		48	63	*
Overweight	52	55		118	150	*
Obese	39	54	*	124	179	*
Total	21	39	*	40	66	*

*If p<0.05.

Around one-fourth of the population in metro cities belonged to deprived caste in both the rounds of IHDS, with a small increment in such population from IHDS-I to IHDS-II. The majority of the population belonged to Hindu religion in metro as well as non-metro region in IHDS 1 and in IHDS 2, while illiterates were higher in the non-metro areas (40.7 percent and 35.3 percent in both surveys round respectively). The respondents belonging to poorest wealth quintiles were more (23.7 percent and 24.3 percent in both surveys round, respectively) in non-metro regions, whereas, respondents

belonging to richest wealth quintiles were more in metro regions.

Table 2 presents the bivariate association between chronic diseases and background as well as behavioural characteristics by metro and non-metro regions of India. Chronic diseases showed a significant increase from IHDS-I to IHDS-II in metro as well as non-metro regions. In both IHDS I and II, the majority of the population having chronic diseases belong to the 60+ age group.

Table 3: Relationship between chronic diseases and background and behavioural characteristics by metro and non-metro regions of India, IHDS 2004 and 2012.

Background characteristics	IHDS I		IHDS II	
	Non-Metro	Metro	Non-Metro	Metro
Age (years)				
<60®	1.00	1.00	1.00	1.00
≥60	5.73* (5.3, 6.2)	8.85* (7.32, 10.69)	6.66* (6.32, 7.03)	7.59* (6.58, 8.77)
Sex				
Male®	1.00	1.00	1.00	1.00
Female	1.59* (1.48, 1.71)	1.34* (1.11, 1.61)	1.47* (1.39, 1.55)	1.37* (1.19, 1.58)
Caste				
Deprived class®	1.00	1.00	1.00	1.00
Non-deprived class	1.74* (1.59, 1.9)	0.92 (0.75, 1.13)	1.62* (1.52, 1.72)	1.21* (1.03, 1.42)
Religion				
Hindu®	1.00	1.00	1.00	1.00
Muslim	1.34* (1.22, 1.48)	0.74* (0.55, 0.99)	1.22* (1.14, 1.31)	0.95 (0.78, 1.16)
Christian	1.81* (1.58, 2.07)	1.27 (0.81, 1.97)	1.38* (1.22, 1.56)	1.59* (1.08, 2.34)
Others	1.05 (0.91, 1.21)	0.82 (0.51, 1.31)	1.68* (1.52, 1.85)	0.49* (0.27, 0.87)
Educational status				
Illiterate®	1.00	1.00	1.00	1.00
Primary completed	1.3* (1.19, 1.42)	1.07 (0.81, 1.42)	1.29* (1.2, 1.38)	1.01 (0.82, 1.25)
Secondary completed	1.26* (1.16, 1.38)	1.19 (0.94, 1.5)	1.28* (1.2, 1.37)	1.15 (0.97, 1.37)
Higher secondary completed	1.01 (0.88, 1.17)	0.86 (0.62, 1.21)	0.92 (0.83, 1.01)	0.86 (0.67, 1.1)
Graduate	1.46* (1.27, 1.68)	1.82* (1.38, 2.4)	1.38* (1.24, 1.53)	1.34* (1.07, 1.69)
Wealth quantile				
Poorest®	1.00	1.00	1.00	1.00
Poorer	1.59* (1.38, 1.85)	1.02 (0.52, 1.99)	1.08 (1, 1.18)	0.95 (0.71, 1.27)
Middle	2.08* (1.8, 2.39)	1.61 (0.87, 2.96)	1.17* (1.08, 1.27)	1.17 (0.91, 1.51)
Richer	2.92* (2.55, 3.35)	2.59* (1.44, 4.65)	1.37* (1.27, 1.48)	1.24 (0.98, 1.59)
Richest	4.43* (3.88, 5.06)	4.5* (2.53, 8.02)	1.74* (1.62, 1.88)	1.21 (0.95, 1.54)
Regions				
Less developed states®	1.00	1.00	1.00	1.00
More developed states	1.51* (1.41, 1.61)	1.21 (0.75, 1.95)	1.22* (1.16, 1.28)	0.85 (0.62, 1.16)
Tobacco consumption				
No®	1.00	1.00	1.00	1.00
Yes	1.2* (1.09, 1.32)	1.2 (0.91, 1.59)	1.32* (1.23, 1.41)	1.44* (1.18, 1.77)
Alcohol consumption				
No®	1.00	1.00	1.00	1.00
Yes	1.13 (0.97, 1.31)	0.87 (0.55, 1.38)	1.15* (1.04, 1.28)	1.63* (1.24, 2.14)
BMI				
Underweight®	1.00	1.00	1.00	1.00
Normal	4.32* (3.48, 5.35)	8.19* (3.25, 20.65)	3.7* (3.37, 4.06)	4.94* (3.48, 7)
Overweight	10.16* (8.04, 12.85)	22.26* (8.75, 56.62)	8.54* (7.71, 9.46)	11.70* (8.17, 16.76)
Obese	9.15* (6.91, 12.11)	26.34* (9.81, 70.73)	10.95* (9.7, 12.35)	17.51* (11.89, 25.8)

*If p<0.05; ®reference category.

Table 4: Fairlie decomposition analysis depicting contribution of background and behavioural characteristics in the difference of chronic diseases by metro and non-metro regions of India, IHDS 2004 and 2012.

Background	IHDS I			IHDS II		
	Coefficient	SE	Percent contribution	Coefficient	SE	Percent contribution
Age (years)	0.0037	0.00023	20.26	0.0062	0.0002	23.78
Sexual status	0.0000	0.00007	0.02	0.0004	0.0001	1.35
Religion	-0.0003	0.00006	-1.60	-0.0005	0.0001	-1.73
Caste	0.0000	0.00003	0.23	0.0002	0.0000	0.61
Education	0.0003	0.00012	1.88	0.0000	0.0001	0.19
Wealth	0.0040	0.00025	21.93	0.0032	0.0002	12.13
Regions of India	0.0059	0.00056	32.05	0.0071	0.0005	27.37
Tobacco consumption	-0.0005	0.00028	-2.97	-0.0009	0.0002	-3.48
Alcohol consumption	0.0000	0.00005	0.04	-0.0001	0.0000	-0.46
BMI	0.0003	0.00009	1.68	0.0005	0.0002	1.80
Total			73.6			61.6
Number of observations	2,15,754			2,03,881		
N of OBS G=0	196497			185915		
N of OBS G=0	19257			17966		
Predictive mean for chronic diseases in non-metro region	0.021			0.040		
Predictive mean for chronic diseases in metro region	0.039			0.066		
Difference	0.018			0.026		
Total explained	0.013			0.016		

The proportion of chronic diseases among females in metro regions was lesser than males in metro regions in 2004, however, a higher proportion of females than males were found from suffering chronic diseases in metro regions in 2012. Concerning states, chronic diseases were more prevalent in the metro as well as non-metro regions in the developed states as comparison to less developed states. Also, the overall prevalence of chronic diseases showed a significant increase from IHDS-I to II in both the regions. The prevalence of chronic diseases among population consuming tobacco and alcohol is higher in metro regions than in non-metro regions for both the datasets.

Table 3 presents the relationship between chronic diseases and background as well as behavioural characteristics by the metro and non-metro regions of India. Results show that for IHDS-I dataset, the population in the age group 60 and above showed a higher likelihood of suffering from chronic diseases in both non-metro (OR=5.73, CI 5.3-6.2) and metro regions (OR=8.85, CI 7.32, 10.69) in comparison to their counterparts. Among metro and non-metro regions, the population in metro regions had significantly more odds to suffer from chronic diseases. Though the likelihood of chronic diseases increased in IHDS-II in both metro and non-metro regions, the pattern remained the same. In both the data sets, females were more likely to suffer from chronic diseases. A higher likelihood of females suffering from chronic disease was found in the non-metro regions in both IHDS-I (OR=1.59, CI 1.48-1.71) and II (OR=1.47, CI 1.39-1.55). Graduates were more likely to suffer from chronic diseases in metro regions as per IHDS-I (OR=1.82, CI 1.38-2.4), while it was non-metro regions according to IHDS-II dataset (OR=1.38, CI 1.24-1.53). Concerning household wealth index in both the datasets, the richest showed the highest likelihood of having chronic diseases in the metro as well as non-metro regions in comparison to the poorest ones. According to both IHDS-I and II, the highest risk of choric diseases was found among the in-metro regions of more developed states. The population consuming tobacco showed a higher risk of suffering from chronic diseases in metro regions as per IHDS-II (OR=1.44, CI 1.18-1.77), and similar was the case with alcohol consumption (OR=1.63, CI 1.24-2.14). In IHDS-I, the obese population showed the highest risk of suffering from chronic diseases in metro regions (OR=26.34, CI 9.81, 70.73) in 2004.

Table 4 shows the results of Fairlie's decomposition analysis depicting the contribution of background and behavioural characteristics in the difference of chronic diseases by metro and non-metro regions of India. The decomposition analysis suggests in both the surveys i.e., in IHDS-I and IHDS-II, the predictive probability of suffering from chronic diseases was more among residents of the metro region (0.039 in IHDS-I and 0.066 in IHDS-II). The model explained the 73.62 percent and 61.39 percent of variation for chronic disease between metro and non-metro regions in IHDS-I and IHDS-II,

respectively. The positive values of the coefficient show that variables are contributing to widening the gap of chronic illnesses among residents from metro and non-metro-regions. In contrast, a negative value indicates that those variables are contributing to narrowing the gap of chronic diseases among residents from metro and non-metro-regions. In both the surveys, it is evident that age (20.3 and 23.8 percent), wealth status (21.9 and 12.1 percent) and regions of India (32 and 27.4 percent) were contributing positively i.e., widening the gap for chronic diseases among people residing in metro and non-metro regions in India in IHDS-I and IHDS-II respectively.

DISCUSSION

The result found in our study that metro cities are having high rates of chronic diseases in 2004 and 2011. The prevalence of chronic disease was 21 and 39 per 1000 in non-metro and metro regions in 2004, where the prevalence increased to 40 and 66 per 1000 in non-metro and metro in 2012, respectively.

Chronic conditions are highly associated with the elderly population, as found in the present study, which is justified by other studies.[20] Previous studies state that diabetes increases with age, and the absolute increase in incidence is observed among adults aged 65 years and above. Also, individuals who have diabetes are at higher risk of acquiring cardiovascular diseases. Therefore age strongly predicts cardiovascular complications.[21] The reason why odds of chronic diseases among elderly are higher in metro regions than non-metro regions is probably because of drastic changes in lifestyle behaviour i.e., change in dietary habits, low physical activity, and nuclear family setup causing loneliness.[22] Gender inequality i.e., treating girls and women as socially inferior in many countries, predicts the higher prevalence of chronic conations among them. Gender inequalities in the allocation of resources, such as income, education, health care, nutrition, and the political voice, are strongly associated with poor health and reduced well-being.[23] Earlier studies found that incidence, morbidity, and mortality from cardiovascular diseases are related to the socio-economic conditions of the individual. It has been found that high blood pressure is the by-product of high educational level, whereas interestingly, diabetes is independent of age, education, and income level. In the case of diabetes, other study reports different results that people from highest wealth quintile were significantly more likely to have diabetes or co-existence of diabetes and hypertension.[24-26] People from highly developed states are very much prone to chronic diseases like Ischaemic heart disease, COPD and strokes, etc. The probable reasons for this are highly developed infrastructure causing low physical activity, dependence on processed food, increase in the proportion of obese people, increase in aging population and environmental factor such as air pollution.[27-29]

The present study also pointed out that people from more developed states are more prone to chronic conditions. However, there was an insignificant lower likelihood of suffering from the chronic condition in metro cities in 2012, the reason was unexplained, and the result is ambiguous as many previous studies confirm that smoking is one of the main contributing factors for heart diseases and high blood pressure.[30-32] High alcohol intake significantly raised systolic and diastolic blood pressure in both men and women.[33] The association of alcohol intake with diabetes and heart disease are interesting as it was found in the literature that low level of alcohol consumption reduces the risk of heart diseases and diabetes whereas high intake results in the opposite direction i.e., it causes a high risk of diabetes and heart diseases.[34-37] It was visible from the results that in 2011-12, in both non-metro and metro regions, people who consume alcohol were having a significantly higher likelihood of suffering from chronic conditions. The risk was much higher in metro regions; alcohol intake is higher among youth in metro regions of India. Body mass index has a strong relationship with diabetes and insulin resistance.[38] As found in the present study that how obesity is significantly associated with chronic conditions, other literature verified the fact that increased BMI is highly related to high blood pressure and heart diseases.[39] Policy interventions call out that urban pollution should adopt a much healthier lifestyle, which comprised of less consumption of junk foods, sugary products, low alcohol consumption, improved smoking practices as well as a regular exercise routine like running yoga or walking should be include.

Limitations

The limitation of the study is that its diabetes, high blood pressure, and heart diseases are self-reported that can cause some validity issues.

CONCLUSION

There is growing evidence that redesigning urban areas and investing in ‘active’ transport to promote physical activity has both health and environmental co-benefits. The fundamental principle is to incorporate physical activity into the daily routine of the urban-dweller; the healthy, active choice must become the easy choice. It is possible with proper urban planning, which can create an efficient public transport system, including provision for pedestrians and cyclists, both physical activity levels and urban air quality will improve. Some parts of the developing world are leapfrogging developed countries. The city of Ahmedabad is the winner of the 2010 sustainable transport award for the successful implementation of “Janmarg,” India’s first full bus rapid transit (BRT) system. City residents have embraced their new BRT system; 18, 000 daily passengers use “Janmarg” to commute to work, to school and elsewhere. In just a few months of operation, it has transformed the transport landscape in the city. “Janmarg” uses innovative

central median stations pulled away from the junctions. Ahmedabad has also initiated car-free days.[40] The holistic approach to city planning is increasingly adopted, and the WHO's healthy cities project in the 1990s was an important step in the right direction. Addressing the challenges of chronic diseases will require a paradigm shift in urban planning that takes account of the differing patterns of urbanization across the world and the need to reconnect it to public health.

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