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Demography and Health Characteristics of Hisar City

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Abstract: ***Demographic characteristics of a country provide an overview of its population size, composition territorial distribution, changes therein and the components of changes such as nativity, mortality, and social mobility. This section on demographic indicators has been subdivided into two parts- population statistics and vital statistics. Population statistics include indicators that measure the population size, sex ratio, density and dependency ratio while vital statistics include indicators such as birth rate, death rate, and natural growth rate, life expectancy at birth, mortality and fertility rates. These indicators for the country as well as states will help in identifying areas that need policy and programmed interventions, setting near and far-term goals, and deciding priorities, besides understanding them in an integrated structure.***

Keywords: Demography, Health Characteristics, Field Survey, GIS, Census data

1. Introduction

Demography is the study of the characteristics of human population, such as size, growth, density, distribution and vital statistics. The present study deals with demographic characteristics like, fertility, mortality, crude birth rate, crude death rate, general fertility rate, child woman ratio, age specific birth rate, health, hospital facility, child immunization and indicators related to urban development. The study of population is an important area of investigation in the field of economics, especially since problems of economic development and development planning have came to the forefront in most developing countries. In order to gain a better understanding of relationship between population trends and economic growth, the following topics have emerged over the years and continue to occupy an important place, both in economics and population studies. (Bhende and Kanitkar, 1997).

2. Statement of the Problem

The present problem proposed for investigation is entitled "Demography and Health Characteristics of Hisar City." Population refers to total human inhabitants of any area. Demography is concerned with size, composition and distribution of population, their pattern of change over time through births, deaths and also determinants of such changes. The knowledge of demographic characteristics is very crucial for planning, particularly by governments in fields such as health, education and housing, social security and social justice. Such studies also provide information which is needed to formulate government population policies, which seek to modify demographic trends to achieve broader economic and social objectives.

3. Objectives

The main objective of the present study remains to;

1. Examine the demographic and health characteristics of the population.

4. Research Methodology

Present study has carried out detailed analysis of social well-being, economic, health and infrastructural aspect of the population. The study is based on field survey, secondary data and GIS related data.

4.1 Data base

Information such as population details of each ward, ward wise map of study area and district gazetteer were collected from municipal committee Hisar and statistical department of Hisar. The digitized map of study area and information map (Hisar constituency) were collected from Haryana Space Application Center (HARSAC) Hisar. Explanatory data for the purpose of comparison of Hisar with Haryana and India has been taken from statistical abstract of Haryana and India, 2001 and provisional population tables, census of India, 2011. The study is largely based on field survey. The questionnaire consists of data related to social, economic, health, and demography and infrastructure aspects.

4.2 Sample Selection

The study is based on 477 samples which is one percent of the total households of the study area. Sample households were selected in proportion to ward population. Samples were collected randomly within each ward. The author has also conducted personal interviews of the Hisar"s households. The author personally went to each ward of study area and put questions related to household"s information and get information about social and economic development of urban area.

4.3 Data processing

The collected data is tabulated and processed with the help of simple statistical techniques such as percentage and ratio. Level of social, economic, and infrastructural development is worked out with the help of composite Z-score. The vital rates of demographic parameters like fertility, mortality and IMR have been calculated with suitable statistical techniques such as Crude Birth Rate (CBR), Crude Death Rate (CDR), Child Woman Ratio (CWR), Age Specific Death Rate (ASDR), and Infant Mortality Rate (IMR) were calculated by social and economic groups. Similarly, population characteristics like age and sex composition of population, literacy rate, per capita income, were calculated and analyses with the help of simple statistical techniques. The processed data is cartographically represented by maps prepared in Arc GIS 9.3.1, Desktop editor and Arc Info. SPSS 12.1 is also used for calculation of standard deviation and mean. AutoCAD map 2000i is also used for map digitization.

5. Study Area

Hisar city located at 29^0 10‟ north latitude and 75^0 45‟ east longitude, is one of the important and fast growing urban center of Haryana. Hisar has grown to a vital position on the urban map of Haryana. It has come up because of its location factors. Its location is such that for any development away from grand trunk road and railway line. Hisar drawn attention city of Faridbad, Gurgoan and Rohtak have different reasons for there growth where as Hisar city is growing entirely on its potential to grow and its nodality in the region.

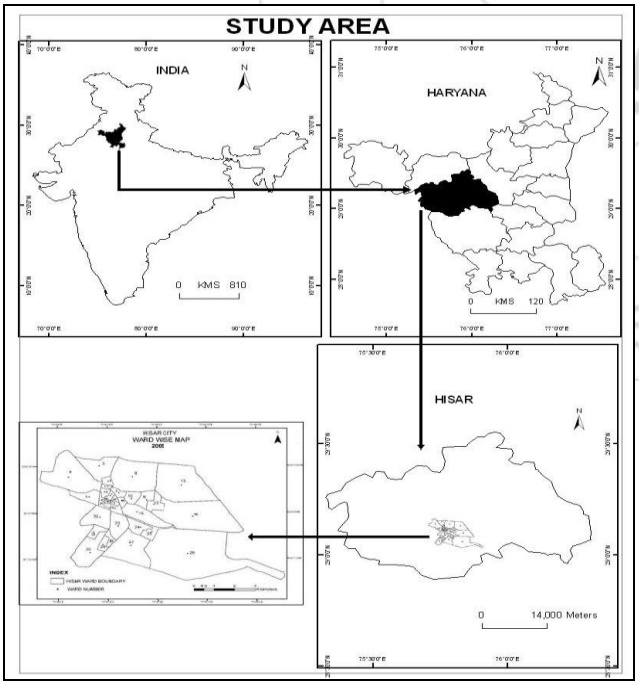

Figure 1

5.1 Origin of the Name of the Town

The city of Hisar was founded by a Muslim ruler, Firozshah Tughlaq in 1354 A.D. „Hisar‟ is an Arabic word which means „Fort‟. The city, which we know today as „Hisar‟, was originally called „Hisar Firoza (also Hisar-e-Firoza) or in other words the „Fort of Firoz‟. But as the days rolled by, the word „Firoza‟ was dropped from its original name. It gained importance in early sixties when agriculture university, was setup as an extension of the Punjab Agriculture University, Ludhiana. Ever, since, the government‟s positive polices and good behaviors have played a vital role in the economic development of the city.The industrial policy of the government has attracted large number of entire preneurs and has resulted into the industrialization in around the city the construction of a new judicial complex and district administrative complex, shifting of Haryana state electricity board offices, setting up of cantonment and development a new residential sectors have made this city a strong growth center in the region in Haryana.

5.2 Measurement of Fertility

Fertility measures are devices to quantify the fertility performance of a population over a period of time. These measures are used to compare fertility behavior of different populations and to examine the trends in fertility of a population over a period of time. There are a number of measures of fertility such as crude birth rate, general fertility rate, child woman ratio, age specific birth rate and the like.

5.2.1 Crude Birth Rate (CBR)

Crude birth rate (CBR) is one of the most commonly used measures of fertility because of its simplicity in concept and measurement. It is the ratio between the total registered live births in a population during a calendar year and the mid-year population. CBR is calculated in the following manner.

CBR= (b/p) k

Where, b is the number of live births in a calendar year, p is the mid-year population and k is a constant, which is generally, taken as 1,000 in all the measures except otherwise mentioned. Thus the CBR is number of live births per 1,000 persons in a calendar year.

CBR= 44/2261x1000= 19.46

Table 1: Hisar: Crude Birth Rate, 2010 (Per thousand)

Total	*Male*	*Female*
19.46	21.19	17.41

Source: Field Survey of Hisar, 2010

Table 1 shows that Crude birth rate of Hisar is 19.46 per thousand of population. Crude birth rate of Hisar is less than CBR of India, which was 25.8 in 2004. It is also less than CBR of Haryana, which was 26.8 in 2004. It is also less than CBR of urban Haryana, which was 23.2 in 2004. There is difference between male crude birth rate (21.19 per thousand) and female crude birth rate (17.41 per thousand).

5.2.2 General Fertility Rate

Another measure of fertility, which has often been used, is known as general fertility rate (GFR). It measures the number of live births in a year per thousand women of normal reproductive age. This is more refined way to measure fertility as it excludes population which is not involved in reproduction. It is calculated as under:

GFR= $(B/W_{15\text{-}44})$ K

Where, B stands for live births in a year and W_{15-44} stands for number of women in normal reproductive age. K is 1,000.
GFR= 44/646x1000=68.11

5.2.3 Child Woman Ratio/Fertility Ratio
It is expressed in terms of number of children below five years of age per thousand females of reproductive age group.
CWR/FR= P_{0-5}/Pf 15-49 x1000
= 116/646x1000= 179.57
Child woman Ratio = 179.57
P_{0-5} = Number of children under 5 years age.
Pf 15-49 = Woman of Childbearing age.

5.2.4 Age Specific Fertility Rate (ASFR)
This is more refined measure of calculating fertility rate since it gives the actual reproduction by women in different age group. The age specific fertility rates are computed as follows:

$$\text{ASFR} = \frac{bi}{pi} xK \quad \text{Where:}$$

b_i is the number of live births to mothers of a specified age group in the population during a year;
p_i is the mid-year female population in the same age group and K is 1,000

Table 2: Age Specific Fertility Rate (ASFR), 2010

Area/Age-	15-	20-24	25-29	30-	35-	40-
X_1 Hisar	15.8	114.8	132.3	51.9	35.9	-
X_2	30.9	233.3	155.0	75.6	36.4	24.4

Sources: Field Survey of Hisar,2010
X_1 Field survey of Hisar, 2010
X_2 Census of India (2001) fertility table (F series), Directorate of census operation Haryana, Chandigarh.

Generally, it is low in early age group and then increased to reach its maximum in the 20-24 and than25-29 age group. Thereafter, it again starts declining. It reaches to its low by the menopause stage in 40-44 age group of woman. ASFR is 15.87 in 15-19 age groups and then increased to reach 114.86 in the age group of 20-24 and 132.35 in the 25-29 age groups. Thereafter, it again starts declining. It reaches to its low by menopause stage in 40-44 age groups of women.

5.2.5 Total Fertility Rate (TFR):
Total fertility rate is another measure of fertility, which has been regarded as the most sensitive, and the most meaningful cross-sectional measure of fertility. It is obtained by summing up the age-specific birth rates and multiplying it by number of years in the age interval. Therefore, it is expressed as under:

TFR = Summation of ASFR X Width of Age Interval / 1000
=350.32 X 5/1000=1.75

Total fertility rate=1.75 Children Per Woman
It sums up in a single number the fertility of all women at a given point of time. It is a "pure" measure of fertility, as it is not affected by variation in age structure of different population. Total fertility rate is 2.8 children per woman for the world. India had a TFR of 3.1 children per woman (2006). In Hisar total fertility rate is 1.75 children per woman which is far below the replacement level.

5.3 Mortality

The simplest measure of mortality is indicating the number of deaths in a particular year per thousands of population (The United Nations).

$$CDR = \frac{\text{Total no. Of deaths in a calendar year}}{\text{Mid year population in a calendar year}} X1000$$

Table 3: Hisar: Sex Wise Crude Death Rate, 2010 (Per thousand)

Death Rate	*Total*	*Male*	*Female*
CDR	9.29	13.04	4.84

Source: Field Survey of Hisar, 2010

Table 4 shows that crude death rate of Hisar is 9.29 per thousand. It is high as compare to national crude death rate, which was 8.5 per thousand (2001). It is also high as compare to state crude death rate of 7.5 per thousand (2001). Urban CDR of India is 6.3 and Haryana is 6.3 per thousand. So Hisar CDR is higher than both which is a sign of bad health. Male crude death rate is high than female crude death rate. Male crude death rate is 13.04 per thousand and female crude death rate is 4.84 per thousands. This reflects the

Table 4: Compare of Hisar: Crude Death Rate, 2010 (Per thousand)

Place	*India (Total)*	*Haryana (Total)*	*Urban India*	*Urban Haryana*	*Hisar*
CDR	8.5	7.5	6.3	6.3	11.13

Source: Field Survey of Hisar, 2010

Biological superiority of the female sex. On the other hand this transition greatly increases the proportionate contribution of causes of death mediated by behaviors, many of which are risky behaviors such as smoking, poor diet and reckless driving that cause more deaths in men.

5.3.1 Infant Mortality Rate (IMR)
IMR is calculated for connoting mortality among children of less than one year of age.
IMR = DO / B1 X 1000
Do = Number of deaths of children under one year of age.
B1 = Number of Live births during that one year.
= 1 / 44 X 1000 = 22.72

Table 5: Hisar: Sex Wise Infant Mortality Rate, 2010 (Per thousands)

Death Rate	*Total*	*Male*	*Female*
IMR	22.72	22.72	-

Source: Field Survey of Hisar, 2010

Table 6: Hisar: Infant Mortality Rate, 2010 (Per thousands)

Place	India	Haryana	Urban India	Urban Haryana	Hisar
IMR	69	67	43	57	22.72

Source: Field Survey of Hisar, 2010

Table 6 shows that infant mortality rate of Hisar is 22.72 per

thousand. Male infant mortality rate is 22.72 per thousand. This does not reflect the true picture as numbers of samples are too low. Comparatively, Haryana female infant mortality rate is 67. Infant mortality rate was 56 per thousand in world (2004). Infant mortality rate was 69 per thousand in India (2004). Rural India infant mortality rate is 74 while urban India infant mortality rate is 43. Urban Haryana infant mortality rate is 57 per thousand, it is very high as compare to Hisar. Urban infant mortality rate is lower than rural because of better excess of health facilities in urban areas. Hisar IMR is less than national infant mortality rate.

5.3.2 Age and Sex Wise Death:

Table 7 shows that mortality is high among males (76.19 percent) than female (23.81 percent). Death is studied with respect to age wise. Mortality is high among males in the less than 15 and 15-44 age group. Mortality is high among females in age group 45-49, because of increase in the proportionate contribution of causes of death mediated by behaviors, many of which are risky behaviors such as smoking, poor diet and reckless driving that cause more deaths in men.

Table 7: Hisar: Age and Sex Wise Deaths, 2010 (In Percent)

Age	Male	Female
<15	100.00	-
15-44	100.00	-
45-59	50.00	50.00
Above 59	78.57	21.43
Total	76.19	23.81

Source: Field Survey of Hisar, 2010

5.3.2.1 Age and Specific Death Rate

$$= \frac{\text{No of deaths of persons in a calendar year of specific age group in a given area}}{\text{Mid - Year Population of that specific age group}} X1000$$

Table 8 shows that highest crude death rate is found in above 59 age group (6.19) and lowest crude death rate in less than 15 age group(0.44).

Table 8: Hisar: Age and Sex Specific Death Rate, 2010 (Per thousand)

Age	*Total*	*Male*	*Female*
<15	0.44	0.82	-
15-44	0.88	1.63	-
45-59	1.77	1.63	1.93
Above 59	6.19	8.96	2.90
CDR	9.29	13.04	4.84

Source: Field Survey of Hisar, 2010

In Middle age human body acquired better resistant against diseases and hence low mortality in this age group. Male death rate is high than female death rate, but in age group 45-59 female death rate is high as compare to male death rate.

5.3.2.2 Death Rate Due to any Specific Cause per Lakh Persons

$$= \frac{\text{Total no. of death because of a particular cause}}{\text{Mid - year population in calendar year}} X100000$$

Table 9 shows that death rate is 928.79 per lakh persons. Male death rate (1303.99 per lakh persons) is high than female death rate (483.55). Highest death rate is 309.60 per lakh persons because of other causes. Secondly the highest death rate (265.37 per lakh persons) because of natural causes. It is most important cause of death for both males and females. Males have higher death rate i.e. 325.10 per lakh because of natural causes than females (193.42 per lakh persons). Death rate is 244.50 per lakh persons because of heart attack. Male"s mortality is higher than female mortality due to accident because of indifferent life style.

Table 9: Hisar: Crude Death Rate to Any Specific Cause Per Lakh Persons, 2010

Causes	Total Death Rate	Male	Female
Natural	265.37	325.10	193.42
Heart-Attack	176.91	244.50	96.71
Accident	88.45	162.10	-
Suicide	-	-	-
Cancer	88.45	162.10	-
Contagious	-	-	-
Other	309.60	407.50	193.42
Total	928.79	1303.9	483.55

Source: Field Survey of Hisar, 2010

Male"s mortality is higher than female mortality due to accident because travel more than females on the roads. There is no case of suicide in the study area neither in male nor in female. Males have higher death rate 162.10 per lakh due to cancer because male take more wine or drugs than females.

5.3.3 Causes of Death

The table 10 shows that about one third deaths have occurred by other causes. About 50 percent deaths have occurred by other causes in the age group 15-44 and more than one third death have occurred by natural causes in the above 59 age group.

Table 10: Hisar: Causes of Death, 2010 (In Percent)

Causes Age Wise	Natural	Heart Attack	Accident	Suicide	Cancer	Contagious	Other
<15	-	-	-	-	-	-	100.00
15-44	-	25.00	25.00	-	-	-	50.00
45-59	-	50.00	14.19	-	-	-	35.81
Above 59	40.32	7.68	-	-	14.29	-	37.71
Total	28.57	19.14	9.44	-	9.52	-	33.33

Source: Field Survey of Hisar, 2010

About one half deaths have occurred by heart-attack between 45-59 age groups. There are 14.19 percent deaths have occurred by accident. About one fourth percent deaths have occurred by accident in 15-44 age groups. There are no case of suicide among males and females in the study area. There are 9.52 percent deaths have occurred by cancer. All deaths have occurred by cancer in above59 age group (14.29 percent). About 33.33 percent death has occurred by other causes of death in the study area.

5.3.3.1 Sex Wise Causes of Death

The table 11 shows that causes of death are studied with respect to age group between male and female. Male"s deaths

rate is higher than females by natural causes in age group 15-44 and above59. Some male"s death is occurred higher than female in last three groups. There is no female death by accident and no case of suicide in the study area. Due to cancer death rate occurred only in the last age group i.e. above 59 and no female death rate found in that age group. The table shows that incident of deaths are more in males than females. There is no contagious case are found in the study area.

Table 11: Hisar: Sex Wise Causes of Death, 2010 (In Percent)

Causes Age Wise	Natural		Heart Attack		Accident		Suicide		Cancer		Contagious	Other	
	M	F	M	F	M	F	M	F	M	F	-	M	F
<15	-	-	-	-	-	-	-	-	-	-	-	100.00	-
15-44	-	-	100.00	-	-	-	-	-	-	-	-	75.00	25.00
45-59	-	-	50.00	50.00	100.00	-	-	-	-	-		-	100.00
Above 59	80.00	20.00	100.00	-	100.00	-	-	-	100.00	-	-	60.00	40.00
Total	80.33	16.67	75.00	25.00	100.00	-	-	-	100.00	-	-	57.14	42.86

Source: Field Survey of Hisar, 2010

The table shows that incident of deaths are more in males than females. There is no contagious case are found in the study area.

5.4 Health Context

Health is an essential input for the development of human resources and the quality of life and in turn the social and economic development of the nation. Improvements in health status of the population have been regard as an index of social development. Moreover, health is regard as an index of social development. Moreover, health is regard as a priority for sustained development interventions at the individual, community and national levels (Ramachandran, 2009).

5.4.1 Composite Index of Health Development

Table 12 reveals that very low developed wards are 3, 4, 9,11,12,19 and 31. Low developed wards are 1, 8,13,15,16 and 22. Moderate developed wards are 5, 10, 14,20,21,24 and 32. High developed wards are 2, 6,7, 17,18, 23,25,26, 27,28 ,29 and 30. About 66.98 percent deliveries take place under the care of qualified doctors. Ward no. 2,5,6,7,9,12, 17 ,18 ,23, 27 ,28 ,30 and 32 have high percentage of deliveries under the care of qualified doctors. Ward no. 8,11,13,14,15, 16, 19 ,20 ,21 ,22, 25 and 29 have moderate percentage of deliveries under the care of qualified doctors. Ward no. 1,10,20,24 and 26 have a low percentage of deliveries under the care of qualified doctors. About 91.30 percent children are immunized against all major diseases. High immunized wards are 1,2,4,5,6,7,8,14,16,17,18,20,21,25,26,27,28 and 29. Moderate immunized wards are 10,13,15,22,23,24,30 and 31. Low immunized wards are 3, 9,11,12,19 and 32. . Therefore, it is also implied that income is positively related to households who have preferred medical treatment in private hospitals.

Fig. 2 shows that very low developed wards are 3, 4, 9,11,12,19 and 31. Low developed wards are 1, 8, 13, 15,16 and 22. Moderate developed wards are 5, 10, 14, 20, 21 ,24 and 32. High developed wards are 2, 6,7, 17,18, 23,25,26 ,27,28,29 and 30.

Table 12: Hisar: Composite Index of Health Development, 2010

Ward no.	*Delivery under Doctor*	*Child Immunization Coverage*	*Average Distance(In Meter)*	*Composite index*
1.	33.33	100.00	460.65	-2.01
2.	100.00	100.00	624.46	0.53
3.	66.66	66.67	765.26	-2.66
4.	50.00	100.00	325.62	-1.44
5.	100.00	100.00	527.89	0.49
6	100.00	100.00	648.54	0.54
7.	100.00	100.00	2060.43	1.09
8.	66.67	100.00	1668.25	-0.30
9.	100.00	50.00	1567.68	-2.12
10.	28.57	85.71	2668.72	-2.19
11.	50.00	66.67	3224.58	-2.33
12.	100.00	50.00	4628.62	-0.94
13.	60.00	85.71	48.25.46	-0.19
14.	50.00	100.00	5214.17	0.45
15.	42.86	90.00	5130.69	-0.48
16.	50.00	100.00	3624.25	-0.17
17.	100.00	100.00	2536.76	1.27
18.	100.00	100.00	2243.65	1.16
19.	50.00	50.00	1432.18	-4.04
20.	50.00	100.00	4672.58	0.24
21.	50.00	100.00	5238.45	0.46
22.	50.00	83.33	6253.72	-0.15
23.	100.00	75.00	7254.66	1.59
24.	40.00	83.33	8656.33	0.40
25.	50.00	100.00	9268.45	2.02
26.	33.33	93.75	10680.56	1.57
27.	75.00	100.00	8735.26	2.74
28.	100.00	100.00	10128.46	4.21
29.	50.00	100.00	6275.30	0.86
30.	77.78	90.00	4730.68	0.69
31.	20.00	80.00	6152.77	-1.51
32.	100.00	66.67	5538.96	0.42

Source: Field Survey of Hisar, 2010

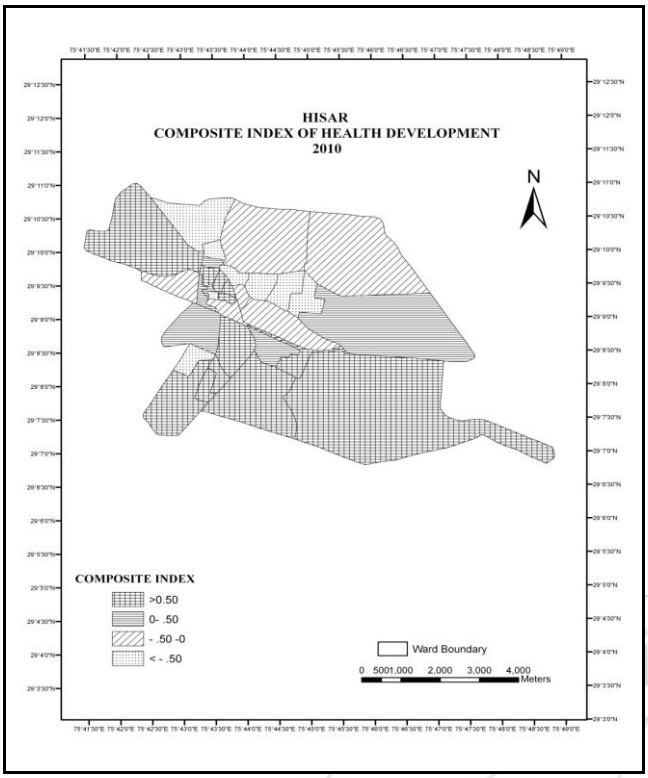

Figure 2

6. Conclusion

The young population consists of about one fourth of the total population. The active population in the age group of 15 to 44 and 45 to 59 is about 56.59 and 14.86 percent of the total population respectively. Old aged persons are seven percent of the total population of the study area which corresponded to the national average. Crude birth rate of Hisar city is 19.46 per thousands of population. It is less than the CBR of urban Haryana and India (28.6 per thousands of population). India had a TFR of 3.1 children per woman (2006). Comparatively, in Hisar total fertility rate is 1.75 children per woman which is far below the replacement level. Crude death rate is 9.29 per thousands. Male crude death rate is higher than female crude death rate. This reflects the biological superiority of the female sex. On the other hand this transition greatly increases the proportionate contribution of cause of death mediated by behaviors such as smoking, poor diet and reckless driving that cause more deaths in men. Infant mortality rate of Hisar is 22.72 per thousand. Comparatively, it was high in urban Haryana (57 per thousands) in 2004. Mortality rate in Hisar is low as compare to urban Haryana because of better excess to health facilities. More than half (55.56 percent) of the deliveries are performed in private hospitals because of better facilities as compare to public or government hospitals and those performed at home. Surprisingly, in very low income group all deliveries have been performed at home in last five years. Delivery in private hospitals is costly. Therefore, cost of delivery at private hospitals is a deterrent to the low income group. Low income group consist of below poverty line population, hence they are not able to afford much to pay for delivery in private hospitals which is not subsidized as in case of public hospitals. There is positive relationship between income and deliveries in private hospitals. Great majority of high income group (96.39 percent) deliveries have been performed in private hospitals. Low immunized wards are 3, 9, 10, 11,12,19,24, and 31. It is happened because people have aspersion about the immunization. Hospitals facilities and income of the families are playing very important role in the place of treatment. Other wards of the Hisar city have well developed health infrastructure. High income group people have preferred private clinics and hospitals whereas low income people preferred government hospitals for treatment because of its low cost as government provide subsidy. Thus income has played very important role in preference for place of treatment. In the last, very low developed wards are 3, 4, 9,11,12,19 and 31. Low developed wards are 1, 8,13,15,16 and 22. Moderate developed wards are 5, 10, 14,20,21,24 and 32. High developed wards are 2,6,7,17,18,23,25,26,27,28,29 and 30, because of hospital facilities, income of the households and political leaders are also lived in these wards.

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