

## An Analytical Study on Present Status of Age-Sex Structure of Nepal

**BASANTA DHAKAL**

*basantadh@gmail.com*

Associate Professor, Tribhuvan University, Nepal Commerce Campus, Kathmandu  
NEPAL

**Abstract** – *The primary aim of this paper is to analyze the status of age-sex composition of current population of Nepal on the basis of urban/rural area, ecological belt and development zone. It also tries to compare the demographic indicators of current population with previous censuses. Data are taken from National Population and Housing Census 2011 and Statistical Year Book Nepal 2011. This study finds that the age dependency ratio and child-women ratio are 67.17 and 393.89 respectively in the current population in the country. Similarly, the median age and sex ratio are 21.76 year and 94.16 respectively. This study expects that the findings of this paper may facilitate the planners and decision makers to formulate the population policies and programs for the nation.*

**Keywords:** Age-dependency ratio, Child –women ratio, Median age, Sex ratio.

### I. INTRODUCTION

Age and sex are basic characteristics or biological attributes of any demographic group of a nation and they show the social, economic, and political structure as well. They influence birth and death rate, internal and international migration, marital status composition, human resources, the gross national product, planning regarding educational and medical services, and housing etc. They also influence the political structure of any nation as the democratic system of any country is stable where there is equal accessible of quality education to males and females. The economic and the social development of nation depend on the number of persons who are economically active, the quality of their works and regularity of their employment.

The male and female have important role to play in overall development of a particular country. Especially, females have greater contribution in socio-economic development of a country because the contribution of women's work has given the positive impact for reducing poverty of any nation. Empowered women contribute to promote health and productivity of whole family and community, and to improve prospects for next generation (Dhakal, 2012:110).

The age-sex distribution of any population estimates school age population on the basis of which,

one can arrive at an estimate of the number of educational institutions, teachers, playgrounds, text books etc. which will be needed for the overall education development of the nation. Similarly, it also estimates the number of voters, entrants in the labor force etc. It can also be done in the field of social welfare; the planning of social services for mothers and children, for the aged, etc. has to be based on age-sex distribution of the population (Bhande & Kanitkar, 2010:142). The economically active population is that part of manpower which actually takes part or tries to take part in the production of goods and services (Henry, 1971:338). Population data, therefore, are classified by age and sex, and then made the policy of the nation according to its characteristics like fertility, mortality, migration, marital status and other economic characteristics.

Age and sex are very important because they are the visible, indisputable and convenient indicators of social status. Sex composition refers to nationality, mortality and migration character of a population through gender's eye. Distribution pattern of male and female in the total population affects relative roles and economic relationships (Ralph, 1965:428). The United Nation has defined age as the estimated or calculated interval of time between the date of birth and the date of census, expressed in completed solar years. Generally, the population of age group between 15 to 59 years is known as economically active, and the people below this age group (0-14 years) and above this age group (60 and 60+ years) are considered as economically dependent, however, some people in the economically dependent age group are found to be active in our society.

Sex is a personal characteristic of a person. Similarly, the age of an individual in surveys is commonly defined in terms of the age of the person at his/her last birth day (Singh & Saymi, 1990:10). So, the composition of population is determined by the number or proportion of males and females in each age group. It is the cumulative outcomes of past trends in fertility, mortality and migration. It is essential for the analysis and description of many other types of demographic data.

Age-sex structure is one of the most important characteristics of population composition. Population analysis based on the age-sex structure of demographic concern, which is required for planning, scientific, technical and commercial purpose. In this respect, it needs to study the present status of age-sex structure of Nepal, which may help the planners make population policies. In this context, this paper attempts to investigate the age-sex structure of current population of Nepal on the basis of urban/rural area, ecological belt and development zone. It also tries to compare the current demographic indicators with previous censuses.

## METHOD

All analysis and discussion are based on published sources of secondary data such as National Population and Housing Census 2011 (NPHC, 2011), Statistical Year Book Nepal 2011 published by Central Bureau of Statistics, and other materials related to age-sex structure of Nepal. Some demographic Statistics such as median age, Proportion of aged person, Proportion of children, aged-child ratio, age-dependency ratio, child-women ratio, masculinity proportion and sex ratio are used to analyze the present status of age-sex structure and their trend and tendency. Population pyramid is used to show the graphic presentation of age-sex distribution in the current population of Nepal. Median age of the population is the age of that population which divides the total population into two equal parts.

$$Md = L + \frac{\frac{N}{2} - c.f}{f} \times h \quad (1)$$

Where  $L$  = Lower limit of median class,  $N$  = Total population,  $c.f$  = Cumulative frequency of preceding median class,  $f$  = Frequency of median class,  $h$  = Size of class interval of median class.

$$\text{Proportion of aged person} = \frac{P_{65+}}{P} \times 100 \quad (2)$$

Where  $P_{65+}$  = Population in the age 65 year and over, and  $P$  = Total population.

According to the proportion of aged persons, a population is said to be young if this figure is less than 5percent and old if this figure is greater or equal to 10percent (Singh & Saymi, 1990:10).

$$\text{Proportion of children under 15} = \frac{P_{0-14}}{P} \times 100 \quad (3)$$

Where  $P_{0-14}$  = Population under the age 15 year. According to proportion of children under 15, a population may be described as young if this value is

over or equal to 40percent and old if this is under 30percent (Singh & Saymi, 1990:10).

$$\text{Aged-child ratio} = \frac{P_{65+}}{P_{0-14}} \times 100 \quad (4)$$

Where  $P_{65+}$  = Population in the age 65 and above. According to aged -child ratio, , the population may be described as young if the aged –child ratio is under 15percent and old if it is over 30percent (Singh & Saymi, 1990:10).

Age dependency ratio is defined as the ratio of the combined child population and aged population to the population of the intermediate ages.

$$\text{Age dependency ratio} = \frac{P_{0-14} + P_{65+}}{P_{15-64}} \times 100 \quad (5)$$

Where  $P_{15-64}$  = Population of intermediate age.

$$\text{Child-women ratio} = \frac{P_{0-4}}{P^f(15-49)} \times 1000 \quad (6)$$

Where  $P^f(15 - 49)$  = Population of women under the child bearing ages 15 to 49 year and  $P_{0-4}$  = total population under the age 4 year.

It is also known as general fertility ratio or ratio of children to women.

$$\text{Masculinity proportion} = \frac{P^m}{P} \times 100 \quad (7)$$

Where  $P^m$  = Male population.

According to Masculinity proportion, 50percent is the point of balance of the sexes or the standard. More than 50percent denotes the excess of males and below the 50percent denotes the excess of females.

Sex ratio of the population is the principal measure of sex composition. It is defined as the number of males over the number of hundred females.

$$\text{Sex ratio} = \frac{P_m}{P_f} \times 100 \quad (8)$$

Where  $P_f$  = Female population.

Percentage excess (or deficit) of males to the total population

$$= \frac{P_m - P_f}{P_m + P_f} \times 100 \quad (9)$$

According to it, the point of balance of the sexes is zero; a positive value denotes an excess of males and a negative value denotes an excess of females.

**RESULTS AND DISCUSSIONS**

According to place of residence, Nepal can be divided into urban and rural area. The following table shows the present status of age -sex composition according to urban and rural areas.

Table 1. Age-sex Composition in Urban /Rural Area

Demographic characteristics	Urban	Rural
Median age of people in year	24.07	21.10
Median age of male in year	23.58	19.85
Median age of female year	24.56	22.05
Proportion of age persons 65+ (percent)	4.49	5.44
Proportion of children under 15 year (percent)	27.98	36.33
Aged child ratio	16.05	14.96
Age dependency ratio	48.09	71.72
Child women ratio	247.98	386.46
Masculinity proportion (percent)	50.98	47.18
Sex ratio	103.98	92.25
Percentage excess(or deficit) of males to the total population	1.95	-4.03

Source: NPHC 2011

Table 1 shows that the median age of people in the urban and rural area are 24.07 and 21.10 year respectively. The median age of male in urban and rural area is 23.58 and 19.85 year respectively. Similarly, the median age of female in urban and rural area is 24.56 and 22.05 year respectively. It means that urban people has high age pattern with compare to rural people by the cause of easy access of health facility in urban area. The proportion of aged person above 65 year is 4.49percent

in urban area and 5.44percent in rural area; it shows the maximum percent of senior people of old age groups are living in rural area in comparison to urban area. The proportion of children under 15 year is 27.98percent in urban area and 36.33percent in rural area. The proportion of children under 15 year is less in urban area by the cause of easy excess of family planning contraceptive and high education level. The aged-child ratio is 16.05 in urban area and 14.96 in rural area; it indicates that the person over 65 year is 16 per 100 urban children and it is around 15 per 100 rural children. The aged dependency ratio is 48.09 in urban area and 71.72 in rural area. It shows the economically inactive population is higher in rural area than the urban area. The child women ratio is 247.98 in urban area and 439.56 in rural area, i.e. 1000 urban women having the age group 15 to 49 year have 248 children under the age of 5 year but it is 440 for 1000 rural women.

The masculinity proportion is 50.98percent in urban area and 47.18 percent in rural area; there is female dominancy in rural population and male dominancy in urban population. The sex ratio is 103.98 in urban area and 92.25 in rural area. The percentage excess of males to the urban population is 1.95percent but the percentage deficit of males to the rural population is 4.03percent. It reveals the sex selective birth trend in urban people.

Ecologically, Nepal is divided into three regions, running east to west. They are the Mountain, the Hill and the Terai (Plains). The age-sex composition of current population distributed over the three regions is shown in table 2.

Table 2. Age-sex Composition in Ecological Belt

Demographic characteristics	Mountain	Hill	Terai
Median age of people in year	20.09	22.18	21.58
Median age of male in year	19.30	21.09	20.68
Median age of female year	20.79	23.01	22.32
Proportion of age persons 65+ (percent)	5.67	4.92	4.81
Proportion of children under 15 year (percent)	38.22	33.46	35.70
Aged child ratio	14.84	17.18	13.50
Age dependency ratio	78.23	64.49	68.12
Child women ratio	463.24	331.85	374.09
Masculinity proportion (percent)	48.41	47.75	49.15
Sex ratio	92.26	91.36	96.66
Percentage excess(or deficit) of males to the total population	-4.03	-4.51	-1.70

Source: NPHC 2011

Table 2 shows that the median age of people in the mountain, hill and terai are 20.09, 22.176 and 21.582 year respectively. The median age of male in mountain, hill and terai is 19.302, 21.098 and 20.675 year

respectively. Similarly, the median age of female in mountain, hill and terai is 20.791, 23.010 and 22.320 year respectively. It reveals that there is highest age pattern in hill region in comparison to others but least

in mountain region. The proportion of age person above 65 year is 5.67percent in mountain, 4.92percent in hill and 4.81percent in terai; it shows that the maximum percent of senior people of old age groups are living in mountain in comparison to hill and terai regions.

Proportion of children under 15 year is 38.22percent in mountain, 33.46percent in hill and 35.70percent in terai. The percent of children under 15 year is highest in mountain region by the cause of less accessibility of family planning program. The aged child ratio is 14.84 in mountain, 17.18 in hill and 13.50 in terai; it indicates that the person over 65 year in mountain region is 15 per 100 children, it is 17 per 100 hilly children and 14 per 100 terai children. The aged dependency ratio is 78.23 in mountain, 64.485 in hill and 68.124 in terai. It reveals that economically inactive population is the highest in mountain and lowest in hill. The child-women ratio is 463.24 in

mountain, 331.85 in hill and 374.09 in terai i.e. 1000 mountain women having the age group 15 to 49 year have 463 children under the age of 5 year but it is 332 for 1000 hilly women and 374 for terai women.

The masculinity proportion is 48.41 in mountain, 47.75 in hill and 49.152 in terai. The sex ratio is 92.258 in mountain, 91.36 in hill and 96.663 in terai. The percentage deficit of males to the total mountain population is 4.03percent while it is 4.51percent in hill and 1.70percent in terai. These indicators clearly show that there is majority of female in the three ecological belts.

Nepal is divided into five administrative development regions like eastern, central, western, mid-western and far-western region.

The age-sex composition of current population in five development regions can be shown in the following table:

Table 3: Age-sex Composition in Development Zone

Demographic characteristics	Eastern	Central	Western	Mid-western	Far-Western
Median age of people in year	22.50	22.76	22.02	19.29	19.18
Median age of male in year	21.47	22.29	20.02	18.51	18.04
Median age of female year	23.27	23.19	23.38	20.07	20.33
Proportion of age persons 65+ (percent)	5.48	5.19	6.39	3.96	4.79
Proportion of children under 15 year (percent)	33.88	33.16	34.06	39.19	39.52
Aged child ratio	16.20	15.65	18.75	10.10	12.11
Age dependency ratio	64.93	62.22	67.92	75.89	79.57
Child women ratio	338.82	340.68	327.52	440.07	449.84
Masculinity proportion (percent)	48.01	50.14	46.53	48.11	47.71
Sex ratio	92.37	100.54	87.03	92.73	91.13
Percentage excess(or deficit) of males to the total population	-3.97	0.27	-6.93	-3.77	-4.57

Source: NPHC 2011

Table 3 shows that the median age of people in eastern, central, western, mid-western and far-western are 22.50, 22.76, 22.027, 19.29 and 19.18 year respectively. The median age of male in eastern, central, western, mid-western and far-western is 21.47, 22.29, 20.020, 18.51 and 18.04 year respectively. Similarly, the median age of female in eastern, central, western, mid-western and far-western is 23.27, 23.19, 23.38, 20.07 and 20.33 year respectively. It indicates that there is high age pattern in central development region and low in far-western development region. The proportion of age person above 65 year is 5.48percent in eastern, 5.19percent in central, 6.39percent in western, 3.96percent mid-western and 4.79percent in far-western; it shows that percent of population over 65 year is the maximum in western development region and least in mid-western development region.

The proportion of children under 15 year is 33.88 percent in eastern, 33.16percent in central, 34.06percent in western, 39.19 percent in mid-western and 39.52percent in far western. It indicates that percent of population under 15 year is the maximum in far-western development region and minimum in central development region. The aged-child ratio indicates that the person over 65 year in eastern region is 16 per 100 children under 15 year; it is 16 per 100 children in central region, 19 per 100 children in western, 10 per 100 children in mid-western and 12 per 100 children in far-western region. The aged-dependency ratio is 64.93 in eastern, 62.22 in central, 67.92 in western, 75.89 in mid-western region and 79.57 in far-western region. It reveals that economically inactive population is the highest in far-western region and lowest in central region.

The child women ratio indicates the 1000 women of eastern development region having the age group 15 to 49 year have 339 children under the age of 5 year. But it is 341 for 1000 women of central development region, 328 for 1000 women of western development region, 440 for 1000 women of mid-western region and 450 for 1000 women of far-western region.

The masculinity proportion is 48.02 in eastern, 50.14 in central, 46.53 in western, 48.11 in mid-western, and 47.71 in far-western region. The sex ratio is 92.37 in eastern, 100.54 in central, 87.03 in western, 92.73 in mid-western and 91.13 in far-western region.

**Table 4. Age-sex Composition in Nepal**

Demographic Characteristics	1991	2001	2011
Median age of people in year	18.92	20.08	21.76
Median age of male population	18.41	19.71	20.78
Median age of female population	18.92	20.47	22.55
Proportion of age persons 65+ (percent)	3.42	4.21	5.27
Proportion of children under 15 yr (percent)	42.40	39.36	34.91
Aged- child ratio	8.06	10.69	15.11
Age dependency ratio	84.57	77.19	67.17
Child- women ratio	614.80	491.81	360.79
Masculinity proportion (percent)	49.87	49.96	48.49
Sex ratio	99.47	99.8	94.16
Percentage excess (or deficit) of males to the total population	-0.27	-0.08	-3.00

Source: NPHC 2011, Statistical Year Book 2011.

Table 4 shows that the median age of overall population of Nepal including median age of male and female has increasing tendency, which shows that life expectancy of Nepalese people is gradually increased in the past 30 years. The proportion of age person over 65 year is 5.27percent in 2011 which is 3.42percent in 1991 and 4.21percent in 2001. It indicates that the population of aged person (over 65 years) has increasing tendency by the cause of health conciseness and modern medicines. The proportion of children under 15 year has decreasing tendency; it signifies the low birth and fertility rates. The aged-child ratio has increased within the past 30 years i.e population of aged person is increased in against the population of children under 15 years which indicates the decline of mortality and birth rates. In 2011, the age dependency ratio is 67.17, which it means that 100 economically active people (between the age group 15 to 64 year) must bear the 67 dependent (under 15 and over 64 year) persons, which is 77.19 in 2001 and 84.57 in 1991. The age dependency ratio has decreased within the past 30 years. It indicates the decline of fertility rate. There is sharp declined in child-women ratio in current

The percentage deficit of males to the total regional population is 3.97percent, 6.93percent, 3.77percent and 4.57percent in eastern, western, mid-western and far-western region respectively but the percentage excess of male is 0.27percent in central development region. These indicators clearly show that there is domination of female population in Nepal, except the central development region.

The following table shows the age-sex composition of overall population in the past 30 years of Nepal.

population in Nepal. The child-women ratio in 2011 is 360.79; it signifies the 1000 women having the age group 15 to 49 year have 361 children under the age of 5 year; but it is 491.81 in 2001 and 615.80 in 1991.

The masculinity proportion is 48.48percent in 2011, 49.96percent in 2001 and 49.87percent in 1991, which indicates the majority of female population in the past 30 years of Nepal. The sex ratio is 94.14 (males per hundred females) in 2011 but it is 99.8 in 2001 and 99.47 in 1991. So the sex ratio is decreased by 5.39 from 2001 to 2011. It means that there is slightly skewed female- to- male ratio with the female population at 51.44 percent against the 48.56 percent of males' population. The percentage deficit of males to the total population is 3.00 percent in 2011, 0.08percent in 2001 and 0.27 percent in 1991. These analyses indicate the excess of females to the total population of Nepal over the past 30 years.

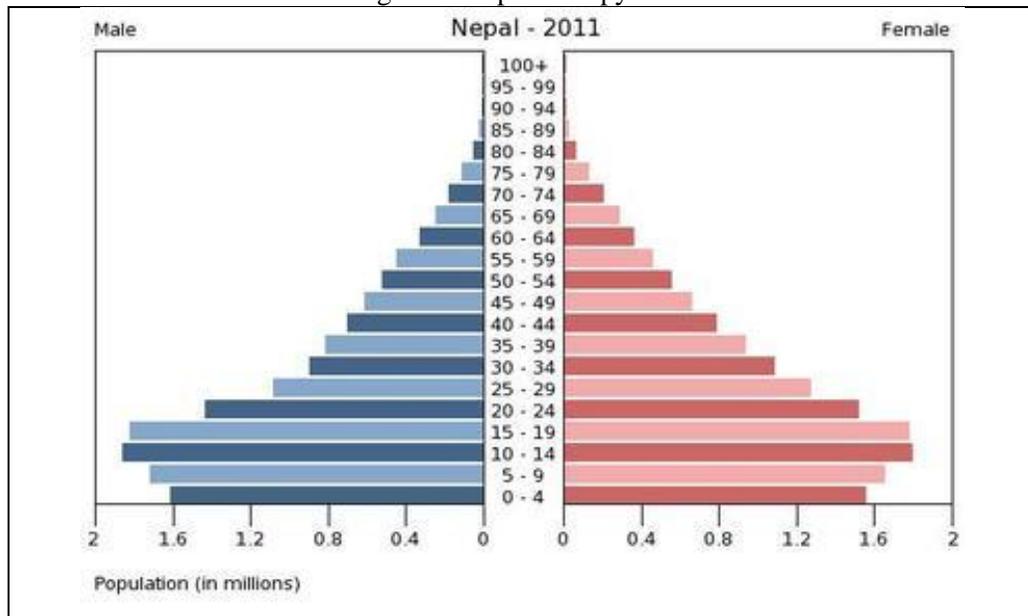
#### Population Pyramid

A population pyramid is a graphic presentation of age-sex distribution. It consists of two back-to-back bar diagram with the population plotted on the x-axis and age on the y-axis, one side shows the number of males

and another side shows the number of females in a particular population of a country in five year age groups. More often, males are shown on left side and

females on the right sides. The following figure shows the present age-sex structure of Nepal based on the census 2011.

Figure 1: Population pyramid



Source: Annex 1

Figure 1 shows the population pyramid of present age-sex structure of Nepal. The pyramid shows that Nepal has broad bases and steeply sloping sides, indicating a large proportion of children (below 15) and young persons (15 to 59), and a small proportion of old people (60 and above) in the population. It is the common characteristic of age-sex structure of population in developing countries.

## CONCLUSION

In Nepal, there is domination of female population in which half of the population covers above the age 21.76 year (median age) and half of them below it. More than 34 percent people are under age 15 year. The proportion of aged person shows the increasing trend of ageing people (over 65 year). The high dependency demands higher investment in social sector like education, health, services, security etc. The proportion of children (under 15 year) shows that there will be more people in active reproductive life in near future. Only 5.27 percent people are of 65 years or above showing low old age dependency rate. It shows the poor health condition and low life expectancy but old age dependency has been gradually increased since last 30 years. There are 59.82 percent people in the working age group (15-64 year). The increasing trend of working age population shows that it is necessary to create new

job markets in the near future. Although, the current demographic indicators show some positive aspects for population control of Nepal, It has revealed Nepal's increasing education level and awareness about over population. Nevertheless, a remarkable point is that a majority of people living outside the country belonging to a reproductive age group. Population stabilization is a multi-sector endeavor requiring constant and effective joint-efforts among the stakeholders, and coordination at all levels of the government and society. Nepal government, therefore, should decentralize the population programs to Village Development Committee in order to reach household level.

## REFERENCES

- Bhende, A.A. and KanitkarT. 2010. *Principal of population studies*. Himalaya Publishing House, New Delhi.
- CBS.2011.*Statistical Year Book Nepal 2011*, Central Bureau of Statistics /National Planning Commission, Nepal Government.
- Chaudhary, R.H. 2004. Ageing in Nepal. *Asia-Pacific Population Journal* 19:61-81.
- Dhakal,B. 2012. Present statistical status of Nepalese women. *The Nepalese Management Review* 15:109-116.

- Donald, B. 1969. *Principles of demography*. John Wiley and Sons, New York.
- Henry, S. 1973. *Methods and materials of demography*, Vol. 1. U.S. Bureau of Census, Washington.
- MOHP.2011. Nepal demographic health survey 2011, Ministry of Health and Population, Nepal Government.
- NPHC.2011. *National population and housing census 2011*, Central Bureau of Statistics /National Planning Commission, Nepal Government.
- Ralph, T. 1965. *Population dynamics*. Random House, New York.
- Singh, M.L. & Saymi, S.B. 1990. *An introduction to mathematical demography*. J.M. Singh & B.D. Manandhar, Kathmandu.
- Visaria, P.M. 1967. Sex ratio at birth in territories with a relatively complete registration. *Eugenics Quarterly* 14: 134-135.
- Warren, T. 1953. *Population problems*. McGraw Hills, New York.

## ANNEX 1

Age Group	Total Population		Male Population		Female Population	
	Number	Percent	Number	Percent	Number	Percent
00-04 Yrs	2,567,963	9.69	1,314,957	10.23	1,253,006	9.18
05-09 Yrs	3,204,859	12.10	1,635,176	12.73	1,569,683	11.50
10-14 Yrs	3,475,424	13.12	1,764,630	13.73	1,710,794	12.54
15-19 Yrs	2,931,980	11.07	1,443,191	11.23	1,488,789	10.91
20-24 Yrs	2,358,071	8.90	1,043,981	8.13	1,314,090	9.63
25-29 Yrs	2,079,354	7.85	917,243	7.14	1,162,111	8.52
30-34 Yrs	1,753,305	6.55	770,577	6.00	964,728	7.07
35-39 Yrs	1,604,319	6.06	740,200	5.76	864,119	6.33
40-44 Yrs	1,386,121	5.23	660,290	5.14	725,831	5.32
45-49 Yrs	1,172,959	4.43	575,101	4.48	597,858	4.38
50-54 Yrs	1,005,476	3.80	505,864	3.94	499,612	3.66
55-59 Yrs	818,263	3.09	412,892	3.21	405,371	2.97
60-64 Yrs	756,827	2.86	368,451	2.87	388,376	2.85
65-69 Yrs	554,449	2.09	277,782	2.16	276,667	2.03
70-74 Yrs	395,153	1.49	199,610	1.55	195,543	1.43
75-79 Yrs	235,135	0.89	117,358	0.91	117,777	0.86
80-84 Yrs	128,777	0.49	62,787	0.49	65,990	0.48
85-89 Yrs	52,526	0.20	25,810	0.20	26,716	0.20
90-94 Yrs	20,335	0.08	8,940	0.07	11,395	0.08
95 + Yrs	11,208	0.04	4,210	0.03	7,007	0.05
Total	26,494,504	100	12,849,041	100	13,645,463	100

Source: NPHC, 2011, CBS.