UNIT 3 POPULATION STRUCTURE

Structure

3.1 INTRODUCTION

Population structure is important concept of population studies which deals with age and sex composition of population across the region or geographic location. Population structure is also known as age –sex population composition in the demographic studies of the area. Age and sex composition is important determinants of economic active population and labour force participation. It also helps to know the demographic dividend of the country and helps in population policy formulation over the time. Age–sex pyramid is the best tool to study the population structure of any country. The other imported of population structure are the social structure of population, religious composition and residential or spatial distribution of the population. For example, population structure tells us that how many people are belonging to particular social or religious groups, working and dependent population, etc in both rural and urban dwellings.

After reading this unit learner will be able to:

(i) Explain the concept and importance of age structure of population and individual

(ii) Discuss age-sex pyramid of the nation

(iii) Describe demographic dividend and labour force

(iv) Differentiate the working age population and dependent population

3.2 CONCEPT OF POPULATION STRUCTURE

As we know that age and sex are two basic components of the characteristics of population. Human being starts their life only with these two characteristics and rest all are societal imposition. The age structure at any point of time, is an indication of the dynamics played by the most important factors for demographic change i.e. fertility and mortality. This structure allows us to understand the supply of manpower, school going population and elderly in any population which further help us for man power planning. Age-sex structure is constructed mostly by using population distribution by five years age group for both the sexes. It is a bar diagram with age group in the vertical axis and proportion of the population in the horizontal axis. Vertical axis is place at the centre and bar diagram is constructed with the proportion of male and female population. Male population is plotted in the left hand side and female population is plotted in the right hand side. As the base population represented by the children is mostly higher than the population at the older ages, the diagram looks like a pyramid. It is called age-sex pyramid.

The importance to study age structure in any country arises with the occurrence of demographic transition when the country experiences low fertility and low mortality. The effect of these two factors (fertility and mortality) shapes the population depending on the differences in pace of their decline. Transition from high fertility to low fertility installs the supply of young in the population. Similarly, reduction in death and increase in the span of life retains older population for long. Thus, shape of the age structure provides an indication about the level of fertility and mortality. Any country where people below 15 years old are large in proportion has a powerful built-in momentum for population growth until and unless there is sharp rise in mortality. The total number of births will be large even if the women bear only one or two children when these large numbers of below 15 females enter into the reproductive age.

According to Srinivasan (UNFPA, 2011), age of individual and age of population are different items in population structure. In terms of age of an individual, the number of birth day completed by that time. So, an age given as 25 years, means that the person is at present between 25 and 26 in terms of completed years of life. In operational definition, this is called chronological age of an individual. Similarly, age of population means the average age of its population distribution which indicates the mean age of the population increase or decrease with time, unlike that of an individual. In this unit, you will read the age and sex composition which are two main components of population structure.

3.3 SIGNIFICANCE OF POPULATION STRUCTURE

Sex and age are the primary variables that are necessary for almost all classifications

related to population characteristics. Both age and sex define the limits of society's reproductive potential (Premi, 2011). Population structure is most important tools to know the birth, death and migration rate at particular point of time of the any country. Population structure is changing in most of the developed countries such as Japan which shows population structure elderly proportionately more than young age population while India is younger age population countries. Population structure tells us the birth rate at particular time and mortality rate also varying by age and sex in the society. Population structures also important in commercial purposes, technical and policy purposes which helps formulating population policies, health policies, and other social welfare scheme. Age composition is important in population structure to know the reproductive age especially female age, health facilities for elderly, educational facilities for children, employment for working age population, sports facilities, voters, etc. Similarly, sex composition in population structure also play important role in health policies and health services. Sex is biological construct while gender is social construct and both sex and gender is important in society. The concept of gender and sex is LGBTQ (Lesbian, Gay, Bisexual, Transgender and Queer) which is important for policy formulation in each group of gender. Each group of gender has their demand and health problems. Sex ratio (SR) is another composition of population sex structure which means females (F) per 1000 males (M) in the population composition (SR= F/M*1000). Sex ratio by age is useful measure to know the migration differentials, mortality differentials and sex ratio at birth.

Check Your Progress 1

Note : a) Write your answer in about 50 words

b) Check your answer with possible answers given at the end of the unit.

1) Explain briefly concept of age and sex composition of population

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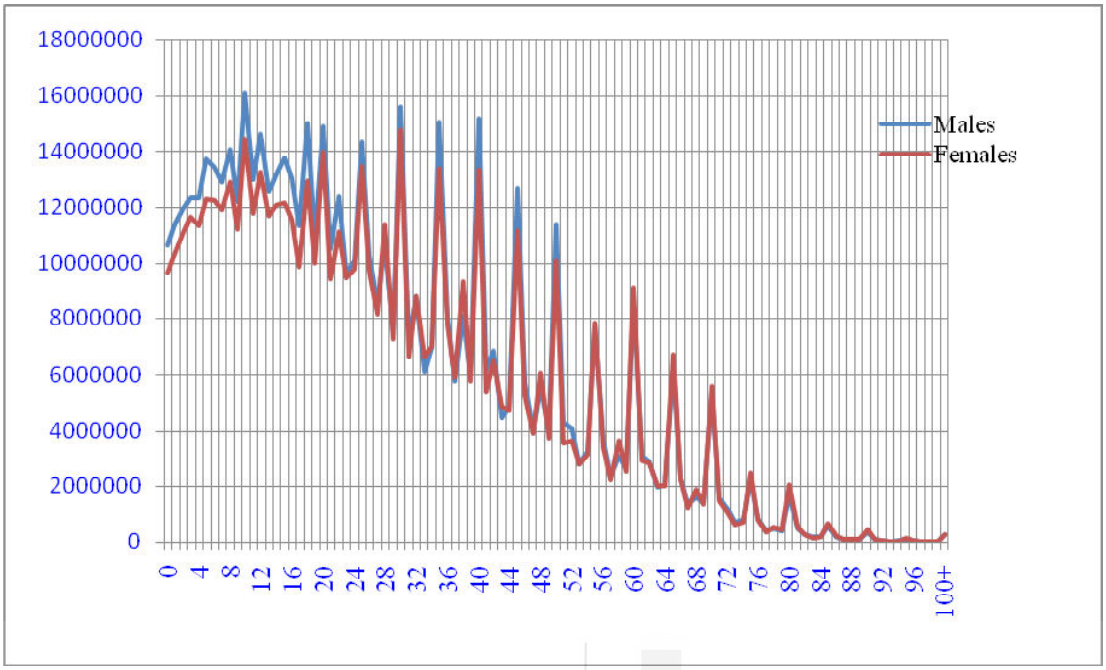
3.4 DATA FOR POPULATION STRUCTURE

Population Census of any country is important source of reliable data of age and sex. It has found that due to digit preference the quality of data is affected. Figure 3.1 shows line graph that age heaping is higher at peaks of ages ending with digit 0 and 5. For example, last digit of age 10, 15, 20, 25….. 90, 95, 100+ peak is highest as compared to the 12, 13, and so on. It happened because of reporting of age during the survey. Most of the people reported their age by saying 10 or 15 years. Some of the respondent assumes that 5 and 10 are good or lucky number and they preferred that digit. It affects quality of age data which affects population policy. We can see in Aadhar card (UID), date of birth mostly mentioned as 01-01-2001, which indicates that people have preferred date of birth by default. It is mostly seen in aadhar of children. Now, this error is over because each birth is happening in health centre and birth certificate issued by that centre.

Figure 3.1: Single Year Population in India, 2011



Source of Data: Census of India (2011), C13 Table

Thus, errors in age data are by two ways- reporting by respondents and recording by enumerator. It is called errors and biases during survey. It is occurring due to misreporting by respondents owing to intended or unintended mindset. Some of them are not stated their ages. In this condition enumerator should asked any events happened before and after births and accordingly record their age. For example, if any old person has not memorize their date of births and birth years then, enumerator asked are you born before independence or after independence (1947).

Errors in age data can be measure by using various indices such as Whipple's Index, Myers' Blended Index, digit preference quotients, Accuracy Index, smoothening of age distributions, etc. Whipple's index is used to measure the digit preference in age 'Zero (0)' while Myers' index used to measure the digit preference in age 'five(5)'. All these methods will be read in the other unit of this course. Thus, census data on age are subject to several types of errors. Selective net under enumeration of infants and young adults, rounding off ages to attractive numbers and deliberate misstatement of age all influence the quality of age data reported in the census.

3.5 CHANGES IN AGE STRUCTURE

India is the second largest populated countries with the proportion of young age population. During the past 60 years or so, India's population has grown steadily without being affected by any large scale events like wars, pestilence, famine, or international migration. Consequently, its age structure has not got any distortions. It is noteworthy that India has a young age structure with almost one third (37%) of the total population in 2011 being children below the age of 15 years, and only 6.8 per cent above the age of 60 years (Table 3.1). India, though experiencing condition of youth bulge, the growth of elderly population is the highest among all groups and 0 to14 age group has experienced negative growth rate in last two census years (Table 3.1).

Table 3.1 Distribution of total population of India by age

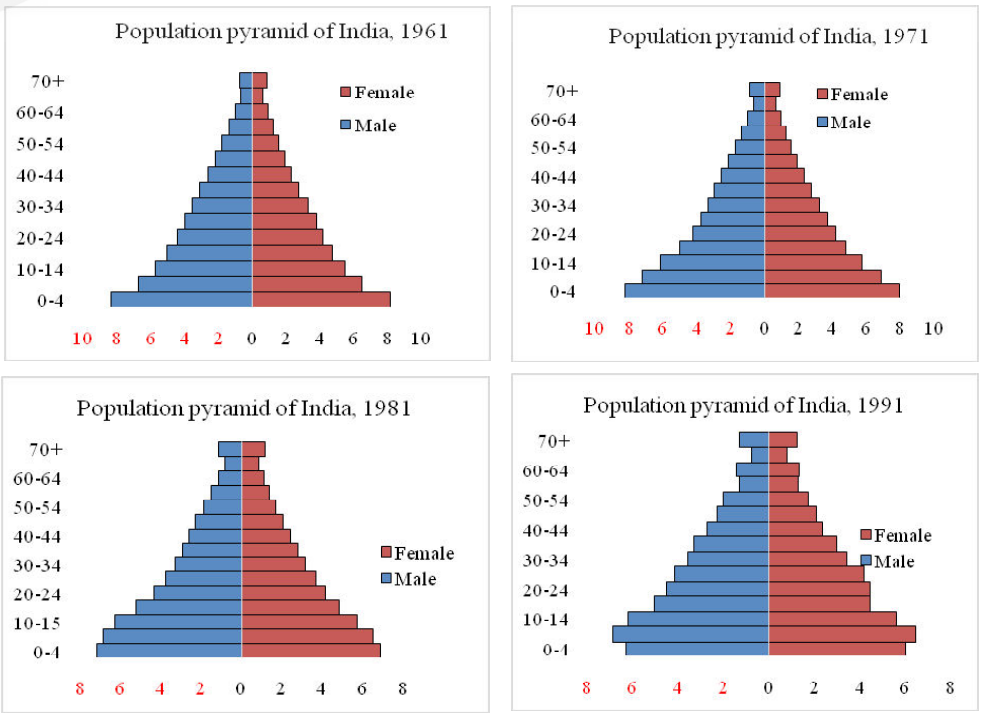
Age group	Census 1991	Census 2001	Census 2011	% Changes (1991-2001)	% Changes (2001-2011)
Total Population	838.6	1028.6	1210	22.66	17.64
0-14	312.4 (37.2)	363.5 (35.34)	372.4 (30.78)	16.36	2.45
15-59	464.8 (55.42)	585.6 (56.9)	730.1 (60.34)	25.99	24.68
60+	56.7 (6.76)	76.6 (7.45)	103.8 (8.58)	35.10	35.51
Index of ageing	18.15	21.07	27.87	16.11	32.27
Age not stated	4.7 (0.56)	2.7 (0.26)	4.5 (0.37)	-42.55	66.67

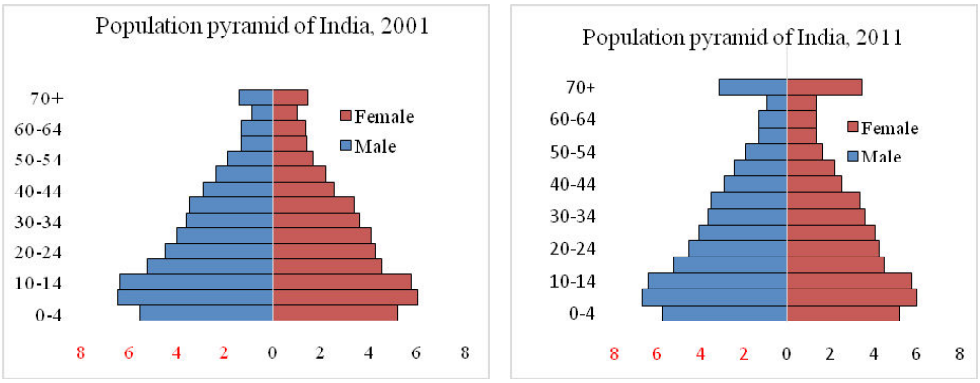
Source: Compiled from Census of India of different years. Population in Million. Figures in the parenthesis are proportions to Total

Index of ageing which is defined as the ratio of the population aged 60 years and above per 100 of population aged 0-14 years. Index of ageing indicates the dependent population trends and pattern over time. In the world, highest index of ageing has reported by Japan followed by Germany and Sweden, where lowest index of ageing has been recorded in Mexico and Zambia. In India, index of ageing has been recorded 18.15, 21.07 and 27.87 per cent in 1991, 2001 and 2011 respectively.

In case of India, the very common phenomena observed after independence is its broad base characterized by high birth rate and tapering top characterized by low expectation of life at birth. In each census shape of the pyramid continues to change (Fig 3.2). With increase in longevity and decline in fertility the base started tapering top started becoming broad. With shrinkage in young children, initially proportion of population in working age group increases creating a structure with 'youth bulge'. The governments of these countries get the opportunity to use them in economically productive way. The situation when they could be productively used is called demographic dividend whereas the government that fails to reap the dividend may suffer from youth unemployment and unrest.

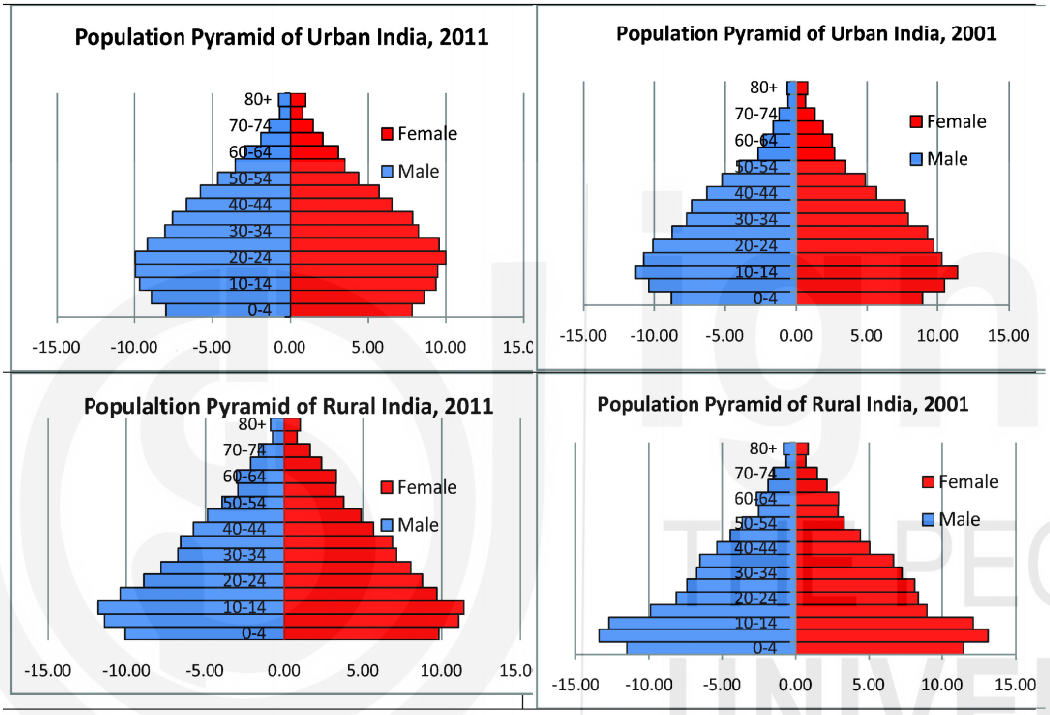
Figure 3.2 Changing age structure of India, 1961-2011





N.B. Age-sex structure is prepared using census data of different series.

Figure 3.3 Rural Urban difference in Age Structure

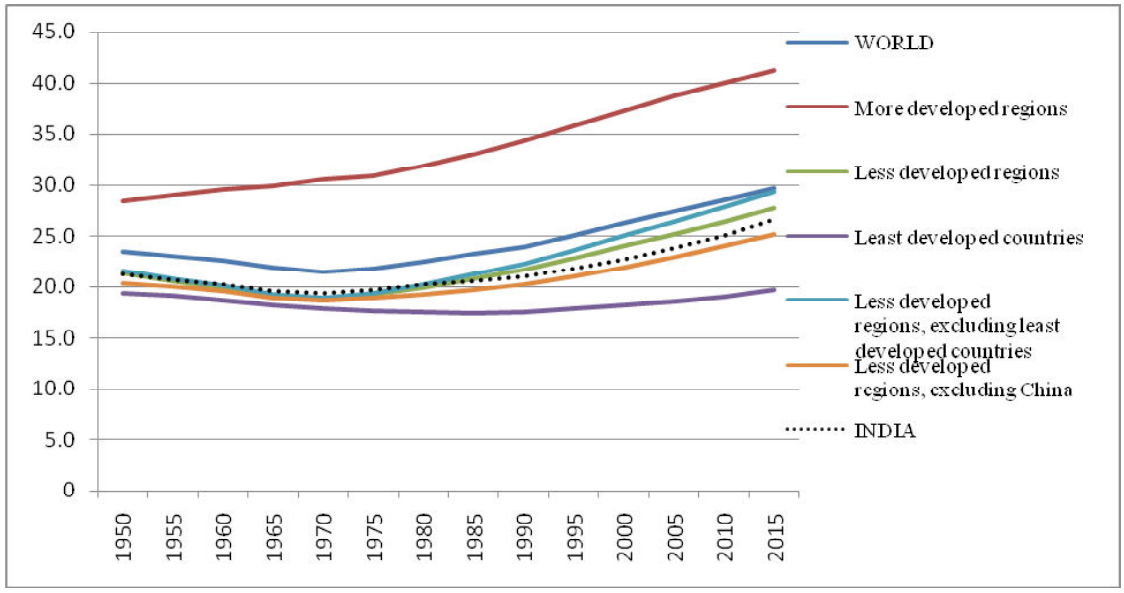


3.5.1 Age-sex Pyramid for Rural and Urban Areas

Though the major determinants of age-sex structure are fertility and mortality dynamics, role of migration cannot be ignored. Role of migration can clearly be visible in urban areas as a major stream of young male migration is from rural to urban areas, mostly in search of jobs. Thus, sex ratio in urban areas mostly favours the males. However, in case of India, the structure seems, majorly determined by fertility and mortality. Urban areas of India experiencing rapid fertility decline along with increase in longevity. Thus, a shrinking base is clearly visible between 2001 and 2011. However, 2011 has shown a pronounced youth bulge in India's urban population which is contributed also by migration. Rural areas on the other hand, though also changing, is still with a wide base which is because of higher fertility (Fig. 3.3). They are contributing to the major part of the population growth in today's India.

All the age sex pyramid shows large base which indicates population has a very high potential of future growth and may take 60-70 years if not more before it becomes a stationary population. In framing the National Population Policy 2000, the Government of India has fixed the target date for population stabilization (becoming stationery) as the year 2045. It is doubtful if the country's population would be become stationary by then implying zero population growth rate.

Fig 3.4 World Trends in Median Age of Population, 1950-2015



Source: http://esa.un.org/unpd/wpp/DVD/

3.5.2 Median Age

The median age which is indicative towards the age structure by implying that 50 percent each of the population is above and below (figure 3.4). When demographic transition is achieved, longevity increases and fertility decreases. Thus, median age of the population increases. When society progresses from 'youth bulge' to ageing median age increases. Higher the median age in a society lower will be the working age population. Median age of the more developed region has reached to more than 40 years whereas in the least developed regions it is only around 20 years. Among the major countries, Germany and Japan have recorded median age more than 46 years. India's trend follows a similar pattern that of less developed region/ country without (except) China. India started experiencing a steady increase in median age only after 1990s with decline in fertility and mortality. India's median age is around 26 years in 2015.

3.5.3 Age Ratio

According to Mandal et al (2007), "the reliability of data on the age composition of five year age groups is usually of more concern to the analyst than the accuracy of reporting of single years of age. It is possible to evaluate the data by age groups on the basis of age ratios. Generally, one would expect the number of persons in one age group to closely approach the mean of the number in each of the two adjacent age groups. An age ratio compares these two numbers by dividing the reported number of persons in the age group by the number expected on the basis of the number of persons reported in each of the adjacent age groups."

The age ratio per 100 females aged 25-29, for example is arrived at as follows-

$$\text{Age ratio, female 25-29} = \frac{\text{Females 25-29}}{\text{½ (females 20-24+females 30-34)}} \times 100$$

Or

$$\text{Age ratio, female 25-29} = \frac{200 \times \text{Females 25-29}}{\text{females 20-24+females 30-34}}$$

We should also know that age ratio can be calculated for each age group (provided the intervals are equal) except in the case of youngest and the oldest age groups. Generally age ratio should be studied for a series of age groups, preferably for the entire span of age for which they can be calculated. A ratio under 100 implies that either – members of the group were selectively under enumerated or – errors in age reporting resulted in mis-classifying persons who belonged to the age group. A ratio of more than 100 suggests the opposite of one or the other or both of these conditions.

Check Your Progress 2

Note : a) Write your answer in about 50 words

b) Check your answer with possible answers given at the end of the unit.

1) Describe population pyramid and its use in population policy

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3.6 DEPENDENCY RATIO

In order to understand age structure, knowledge about the concept of dependency is essential. Dependency ratio is ratio of dependent population (<15 & >60 year) on working age population. Working age population in case of India is defined as population between 15-59 years of age, whereas for some other countries it is defined as population of age 15-64. Dependency ratio is categorized as young age dependency ratio (YADR), old age dependency ratio (OADR). Combining these two we get total dependency ratio. We find out them as follows:

$$\textbf{YADR} = \frac{\text{Total population in } 0-14 \text{ years age}}{\text{Total population in } 15-59 \text{ years age}} \times 100$$

$$\textbf{OADR} = \frac{\text{Total population in } 60+ \text{ years age}}{\text{Total population in } 15-59 \text{ years age}} \times 100$$

$$\textbf{DR} = \frac{\text{Total population in} < 14 + 60+ \text{ years age}}{\text{Total population in } 15-59 \text{ years age}} \times 100$$

However, it is important to note that total dependency ratio sometimes is misleading as it does not weigh the age structure.

Table 3.2 Dependency Ratio, India 1961-2011

Dependency ratio	1961	1971	1981	1991	2001	2011
Young age DR	75.90	78.68	79.92	76.16	73.08	69.69
Old age DR	8.98	9.66	9.77	10.69	11.58	11.99
Total DR	84.88	88.34	89.69	86.85	84.65	81.68

Source: Calculated on the basis of Census of India of different series

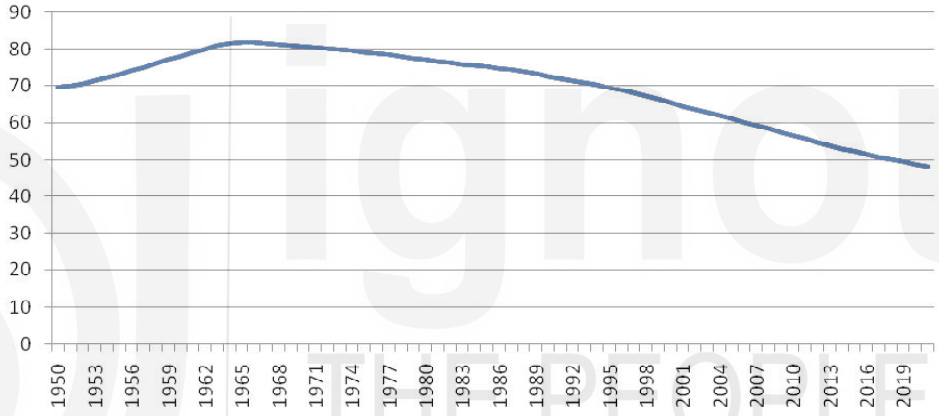
In case of India, decline in young age dependency is clearly visible along with the increase in old age dependency. Because of large working age population, overall dependency is still moderate in India (Table 3.2).

It is pertinent to mention here that the young age dependency ratio is high in the fast growing population and old age dependency ratio is very low. Developed country have a large proportion of population aged 60 and above, hence they have large OADR. Index of ageing brings out this point more clearly since it is more than 100 in Japan, Germany, Sweden and UK and is just 100 in France and USA (1990s).

Source:
https://www.youtube.com/watch?v=DCKWhHtlDFg&t=3s

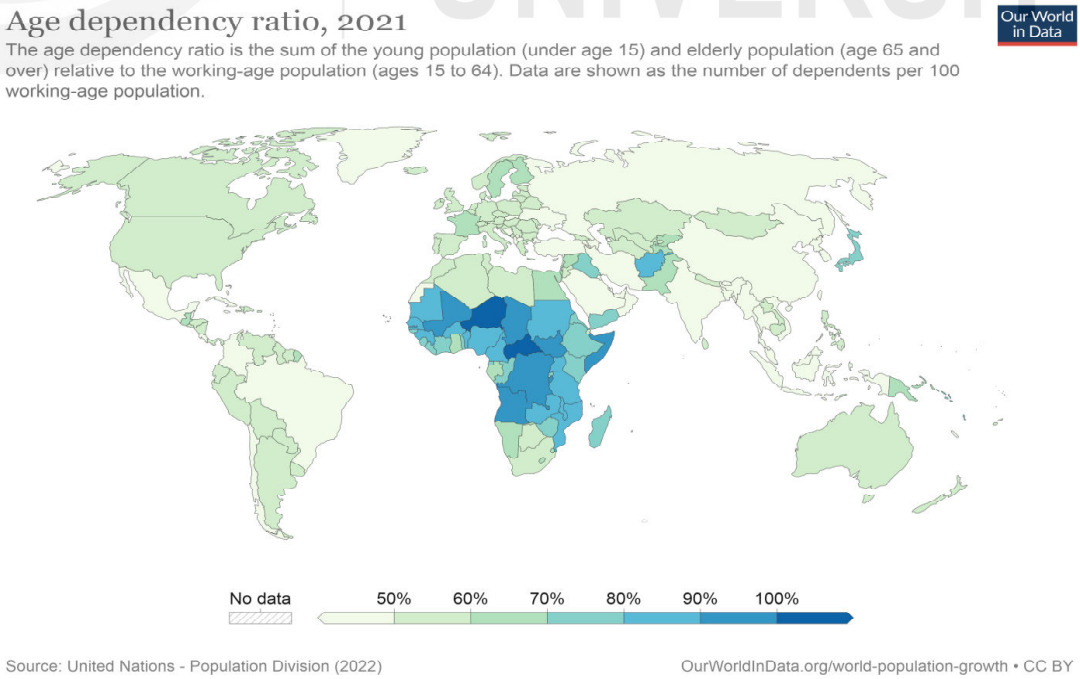
Dependency Ratio video: Scan QR code for learn

Figure 3.5: Dependency Ratio in India, 1950-2021



Source: https://ourworldindata.org/grapher/age-dependency-ratio-of-working-age-population?tab=table&time=earliest..2021&country=~NER

Figure 3.6: Dependency Ratio in World, 2021



Source: https://ourworldindata.org/grapher/age-dependency-ratio-of-working-age-population?country=~NER

The developed nations consider aged persons as these who are above the age of 65 years. In that case, the dependency ratio is defined as population (0-14+65years and above) / population (15-64 years)* 100. In this definition the numerator becomes somewhat smaller while the denominator increases correspondingly, resultant of this both the dependency ratio and the index of ageing become smaller.

As we know that if working age population is lower proportionately to nonworking population then tends to reduce savings and social advancement of a country as a large proportion of scarce resources are diverted towards consumption. Also an increasingly large number of persons continue to enter the working ages swelling the ranks of the unemployed. Further, certain social and economic processes such as family formation and home purchase, job seeking, retirement and savings, migration and mobility are closely related to the age composition of a population. Although the proportion of senior citizens in the country is small compared to most of the developed and many developing countries their absolute size is greater than the total population of most countries in the world.

3.7 AGE GROUPED POPULATION STRUCTURE

If we see the data structure of the population it is found that age structure of a country's population is normally presented in five-yearly age groups. As we know that below 14 years population is not considered as working age population and are called child labour not allowed in workforce participation in any country. Here you can read age grouped population into child population 0-14 years, child population aged 0-6 years, working age population, elderly and dependent population.

3.7.1 Child Population Aged 0-14 years

There is perceptible decline in the proportion of children below the age of 15 years. The decline during the past 30 years due to a decline in birth rates. Table 3.3 clearly shows that slightly more than 37 crore population (30.76%) were below 15 years in which male and female are about 19 crore and 18 crore respectively in India during 2011. Even though child labour is not allowed, but nearly 43 lakhs were main worker in India, who belongs to age of 5-14 years in 2011. Nearly 10 lakhs male main workers higher than their female counterpart during the same period.

3.7.2 Child Population Aged 0-6 years

Because of special tabulation of population aged 0-6 years, we consider here the variation in it for the major states and Delhi, and all the states have reported that this age group population has declined over the time (Premi, 2001). Considering the major states, it is observed that the decline in the proportion of girls aged 0-6 years was quite substantial compared to that in respect of boys in Haryana, Punjab, Delhi and Uttrakhand. This points to shortage of girls at birth therein as pointed out earlier while considering sex ratio at birth.

3.7.3 Working Age Population

Generally, working age is considered at 15-59 years in India, while at international level it is 15-64 years. Table 3.3 shows that in 2011 India has reported about 73 crores population were belong to working age which is slightly higher than 60 percentage of total population in India in 2011. Table 3.3 shows that young adults

(15-24 years) are about 19 percent (23 crores) and they are prospective job seeker in India. It also indicates that the childbearing age group has systematically increased implying population momentum that can lead to more births even after decline in birth rate.

Table 3.3: Population by grouped age and main worker in India, 2011

Age group years	Population			Main Worker		
	Persons	Males	Females	Persons	Males	Females
0-4	112806778	58632074	54174704	-	-	-
5-9	126928126	66300466	60627660	1108808	630875	477933
10-14	132709212	69418835	63290377	3244439	2033172	1211267
15-19	120526449	63982396	56544053	17703310	12721891	4981419
20-24	111424222	57584693	53839529	38664170	28977411	9686759
25-29	101413965	51344208	50069757	48666298	36901575	11764723
30-34	88594951	44660674	43934277	47152411	35600323	11552088
35-39	85140684	42919381	42221303	47503671	35372529	12131142
40-49	134756439	69683500	65072939	77295643	58397073	18898570
50-59	88215309	45299278	42916031	47440004	36456219	10983785
60-69	64118690	31646075	32472615	23840363	18216604	5623759
70-79	28441345	14142102	14299243	6917739	5560331	1357408
80+	11289005	5283695	6005310	1850952	1463786	387166
Age not stated	*4489802*	*2372881*	*2116921*	*1177763*	*878187*	*299576*
0-14, 5-14	372444116	194351375	178092741	4353247	2664047	1689200
15-59	730072019	375474130	354597889	324425507	244427021	79998486
60+	103849040	51071872	52777168	32609054	25240721	7368333
15-24	231950671	121567089	110383582	56367480	41699302	14668178
Total	**1210854977**	**623270258**	**587584719**	**362565571**	**273209976**	**89355595**

Source: Census of India, 2011 (B1 Table)

3.7.4 Ageing Population

The proportions of children in the population decrease and those of old persons increase is known as the aging of the population (Bhende and Kanitkar, 2010). The senior citizens (aged 60 years and above) in India numbered 10.38 crores in 2011. This population has been increasing over census because of increasing life expectation and better health facilities. Female elderly population is more than male elderly in India. Customorily female life expectancy is more than male across the world. Although the proportion of senior citizens in the country is small compared to most of the developed and many developing countries, their absolute size is greater than the total population of most countries in the world (Premi, 2001).

3.7.5 Elderly and Households

In India society, elderly person are most respected in the household as well as in neighborhood. Of the total households in the country three tenth had at least one

elderly person. Among them there was only one elderly person in 71 percent of the households. There are 3.1 million households that comprise only one elderly person and none else. Three tenths of them had only one male person while seven tenths had only one female person. Of the one person elderly households, 81 percent are in rural areas and the rest in urban areas. The situation regarding the proportion of male and female headed households is no different in rural and urban population. These data bring out the problem of elderly females living alone in the country (Premi 2001).

3.7.6 Household Heads among the Elderly

We have separate data for the elderly in 60-69, and so on group. At the national level female headed households comprised 17.4 percent with a slightly higher proportion in urban areas. Proportion of female headed households was somewhat higher for 70-79 year age group but fell sharply for women aged 80 years and over. Himachal Pradesh has reported higher female headed households followed by Uttarakhand. In contrast, most of the northern and central Indian states have low rates of female headship. These are the states starting from Jammu to Madhya Pradesh. The reason may be due to patriarchal mindset in the northern states. In Muslim community and in Jat and Rajput community where women are in low esteem is one of the reasons of lower female headed households.

3.7.7 Factors Affecting Age Composition

As you have read above that age composition is influenced by the fertility, mortality, and migration over the period of time. Other factors are wars, famine, pandemic, etc. We have also seen in the population pyramid, India is characterized by broad base pyramid which indicates high birth rate, if birth and death rates declined for some point of time then age sex or population pyramid shows narrow base and steep sides.

Thus age structures are influenced by birth, death and migration and these three components of demographic studies are the determinants factors of age structure of population. Now we have to read the sex composition of the population structure.

3.8 SEX COMPOSITION IN POPULATION STRUCTURE

Sex ratio is the basic tool for the analysis for the composition of population. It is well established that males out-number females at birth which means sex ratio at birth is normally about 105.5. High birth rate is the best determinant of high sex ratio (Mandal, et al, 2007). After understanding the age structure it is important for us to know the sex ratio by major important age group. Sex ratio is analyzed to understand the degree of balance between two sexes of the population i.e. males and females. This ratio is normalized to refer to a standard unit of people, usually 100 persons but in India it is measured as female per 1000 of males. Though, in general, the number of male and female should be more or less the same, but that did not happen actually. At birth, sex ratio among human population in general is 105 males per 100 female babies. Gender differential in mortality is a universal phenomenon. In the society without any gender based discrimination, chances of

death for the male neonatals and infants are more than the female babies which further balances the sex ratio in favour of the females. However, in some countries differential treatment to female baby overwhelms the biological difference and female deficit occurs in the population due to excess mortality. Sex ratio needs to be studied, specially for India in four components like i) overall sex ratio (OSR) ii)sex ratio at birth (SRB), iii) child sex ratio (CSR), iv) elderly sex ratio (ESR).

Table 3.4 Trends in Sex Ratio in India

Year	Overall Sex Ratio	Child Sex Ratio (0-6 years)	Elderly Sex Ratio
1961	941	976	992
1971	930	964	946
1981	934	962	964
1991	926	945	931
2001	933	927	1029
2011	943	918	1033

Source : Computed from Census of India from various years survey

3.8.1 Overall Sex Ratio

In most of the countries in the World where son preference is not entertained, over all sex ratio favours the females. World sex ratio is 98 female per 100 male (source: http://statisticstimes.com/population/countries-by-sex-ratio.php). Numbers of populated countries in Asia have sex ratio favouring males. That dominated the overall world sex ratio in favour of the males.

India, unlike other developed countries, remained female deficit for more than a century. Here we have the sex ratio since 1901 (Fig.2.4). In 1901 sex ratio in India was 972 and till the recent census of 2011, sex ratio of India remained much lower than the level recorded by 1901. More alarmingly, after Independence, the sex ratio was declining almost steadily till 1971. 1991 has recorded the lowest sex ratio of 926. Since 1991, some improvement in the sex ratio is observed (Table 3.4). To understand the gender dynamics in the overall sex ratio, it is important for us to analyse the child sex ratio and elderly sex ratio separately. This will help us to understand the vulnerability of the section of the females to discrimination.

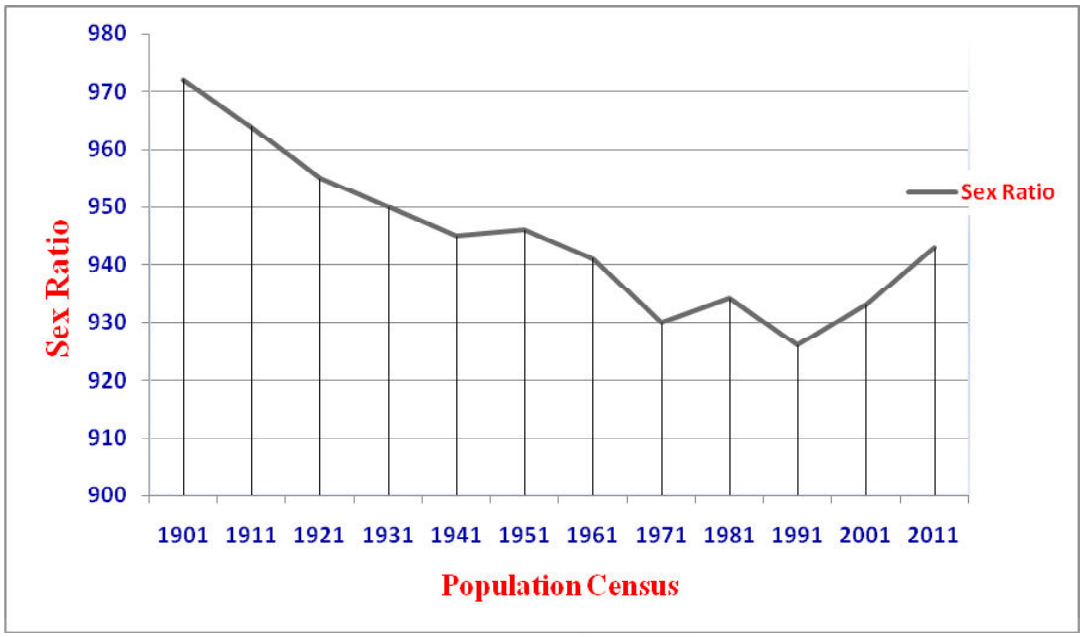
The use of pre-natal diagnostic techniques is restricted:

- for the purpose of detecting genetic or metabolic disorders or chromosomal abnormalities or certain congenital mal-formations or sex linked disorders;

-for the prevention of the misuse of such techniques for the purpose of pre-natal sex determination leading to female foeticide; and

- for matters connected there with or incidental thereto.

Figure 3.7 Trends in sex ratio, India



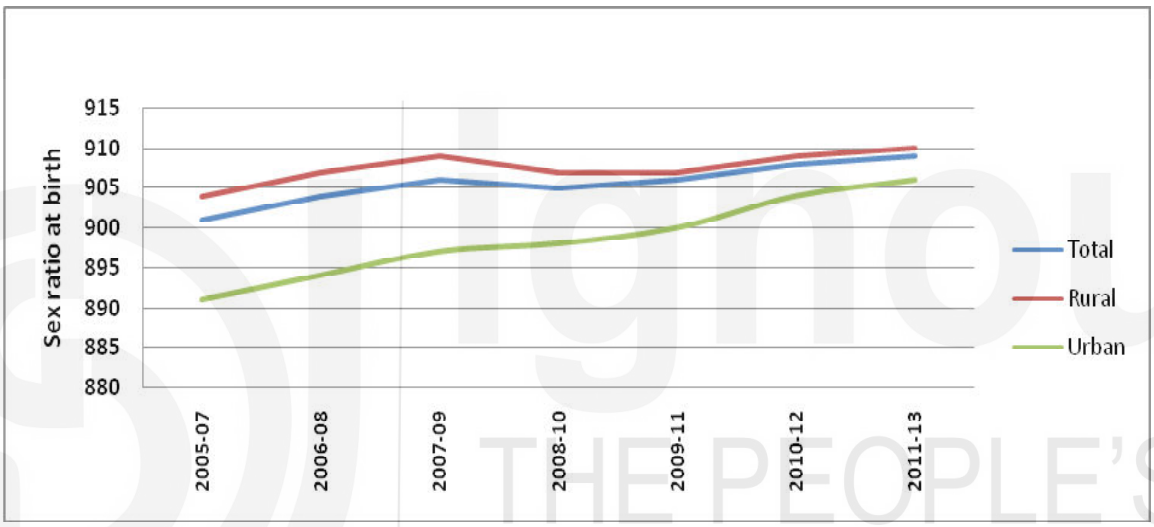
3.8.2 Sex Ratio at Birth (SRB)

Sex ratio at births and deaths are traditionally considered as two important measures to examine the quality of data in any population (James, et al,). Sex ratio at birth is mostly standard ideal as 105 male per 100 female births. However, due to higher infant mortality among the males in most of the society, number of females increases in over all sex ratio. This pattern does not hold true in the society like India where gender based discrimination is observed. The discrimination starts before birth through the use of ultrasound technology (Sonography) which is most commonly used for sex determination. Sex determination is a result of deep rooted son preference in the society. Preconception and prenatal sex selection leads to avoid the live of female fetus, resulting into extremely skewed sex ratio favouring male babies at birth.

Understanding the scope of using technology to satisfy their preference for male baby, Government of India took several legal initiatives. Misuse of Pre-natal diagnostic techniques especially amniocentesis was banned in government hospitals and government laboratories. However, that could not improve the fate of the female fetus those were aborted before seeing the light of the earth. Health activists and women's group relentlessly tried for a more effective legislation and launched a campaign in 1986 in Maharashtra. The campaign forced the Government of Maharashtra to formulate an Act at the state level which is known as Maharashtra Regulation of Pre-natal Diagnostic Techniques Act, 1988. However, campaign did not stop there. As a result, Parliament enacted the Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act on 20th September 1994 which is known as PNDT Act. Over the time technology has been developed to the extent that sex could be determined before conception of the child. The need for amendment arises out of that to introduce the Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act in 1996. Certain amendments in the Rules of 1996 are introduced to ensure effective implementation of the Act. The amended Rules have come into effect from 14th Feb.2003.

Sample Registration System (SRS) of India provides data on sex ratio at birth to monitor the improvement in SRB. SRB in India is plotted separately for rural and urban. It is observed that there is a steady improvement in SRB over last six years for both the rural and urban areas, but the improvement is more prominent in urban areas than it is in rural areas (Fig. 2.5). However, there is no reason to believe that son preference is higher among urban population than it is among rural population. The reasons for lower sex ratio at birth in urban areas are two folds: i) The diagnostic centres are more easily available in urban areas and ii) urban people can afford the cost of diagnostic test. It is also said that in high fertility regime, couples automatically give birth to desired number of sons. Thus they do not try to select the fetus of preferred sex. Thus in rural areas it is a combination of relatively high fertility than urban areas and lack of facility contributed in higher SRB than it is in urban areas.

Figure 3.8 Trends in Sex Ratio Birth, India



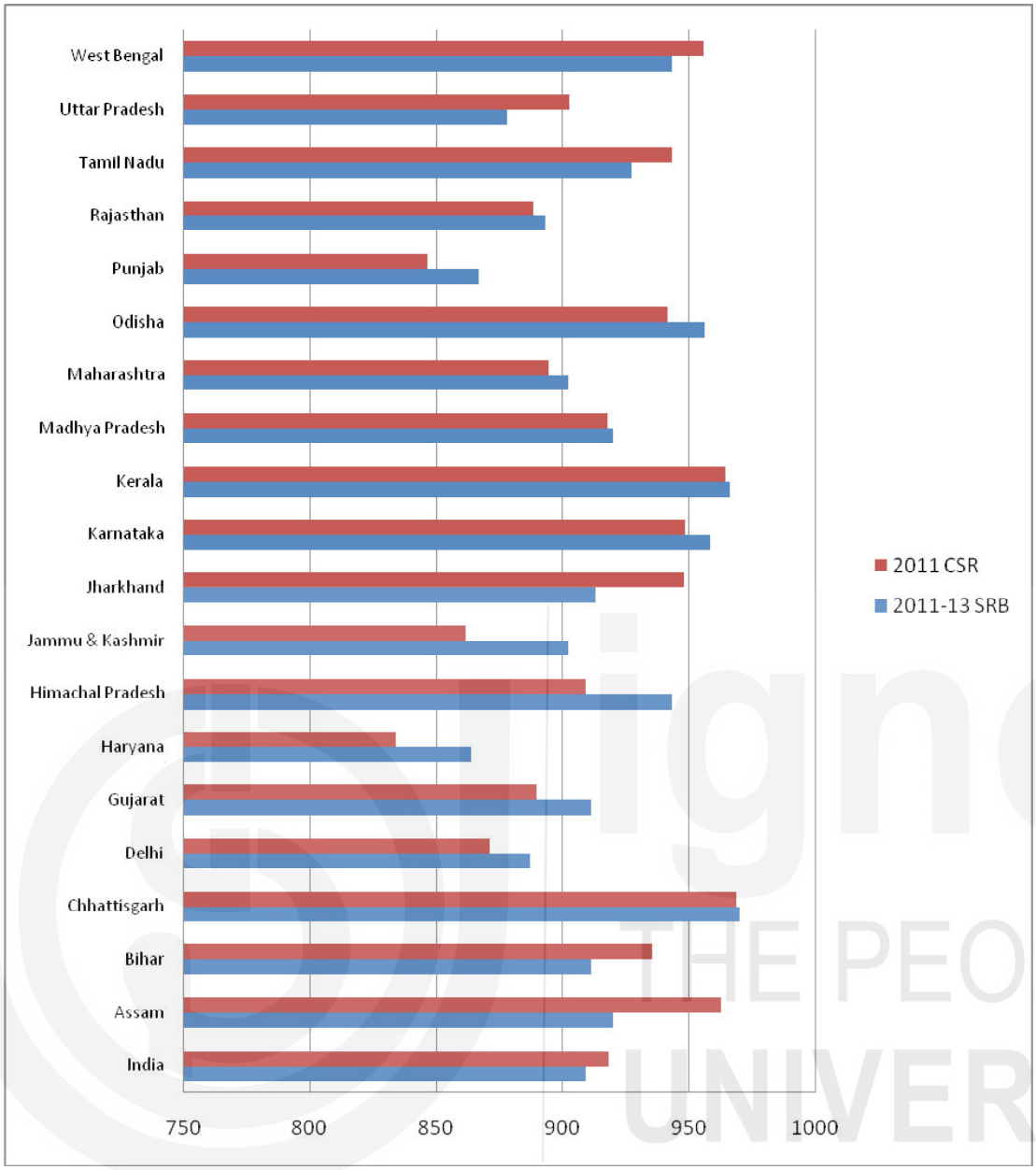
Source: Based on SRS Statistical Report 2011, 2012 and 2013

The number of missing girls can be computed from the difference between the actual SRB and the natural SRB. In other words, it is the difference between the actual number of girls born and the number of girls who would have been born if the SRB was 948.7 girls per 1000 boys. The resultant gap represents the estimated number of girls missing due to sex selection. http://countryoffice.unfpa.org/india/drive/MissingGirls Brochure_LowResPDF.pdf

Source: Based on SRS Statistical Report 2013 and Census of India 2011

In spite of several attempt by the government of India, and improvement in SRB, some of the states are terribly poor performing. Considering the generalized ratio of 105 male per 100 female babies, SRB should be around 950 female per 1000 males. However, the states of Maharashtra, Jammu and Kashmir, Rajasthan, Delhi, Uttar Pradesh, Punjab and Haryana have recorded alarmingly low SRB. There are only four major states in India which has sex ratio more than critical mark of 950 female per 1000 male. They are namely, Chhattisgarh, Kerala, Karnataka and Odisha.

Figure 3.9 SRB and CSR in the Major States of India around 2011



3.8.3 Child Sex Ratio

As SRB reveals the status of sex selection prior to conception and birth, CSR reveals after birth gender based discrimination. Adverse CSR to the female could be a result of low SRB or could be because of excess female mortality over male in that particular age group. It was only during 1991 when population at 7+ age group was published by the Census of India to calculate literacy rate, scholars noticed that CSR has gone below 950 which was considered as standard sex ratio at birth. It is important to mention here that since Independence, CSR was showing a continuous decline which has crossed the critical mark in 1991. Since then it is showing a continuous decline. Major share of CSR is still very low sex ratio at birth (Figure 3.9).

It has already been noted that overall sex ratio in India has declined from the year 1901. But the decline in CSR during 1961 to 2011 is much faster than over all sex ratio which has shown some improvements over the decades. An attempt is made to graphically represent SRB and CSR for the major states of India. Though the

result are not strictly comparable as the CSR is from census data and SRB is from Sample Registration System data, it is evident that India has hard task ahead to reach the target of 950 female per 1000 male baby. It is only in the state of Kerala and Chhattisgarh which have maintained this sex ratio both at birth and among the children.

3.8.4 Elderly Sex Ratio

As it has been already mentioned that India is experiencing a faster growth among the elderly population, it is essential to understand the phenomena from a gender perspective. This is important with the faster increase in longevity among the women that it is among the men. Under equal treatment to both the gender, chances of survival are more for the women than it is among the men. With the consistent availability of health technology women continue to live longer making elderly sex ratio inclined towards female.

One may ask that how gender discrimination is diminishing at older ages? Actually two factors together work for this. Firstly, almost universal motherhood in India and high maternal death situation put every woman in the risk of maternal death. Their chances of survival automatically increase once they cross their reproductive age. Similarly, in Indian society, with age they gain control over the household resources and decision making. That reduces the discrimination between genders.

However, it goes to prove once again that men die early and women suffer.

Check Your Progress 3

Note : a) Write your answer in about 50 words

b) Check your answer with possible answers given at the end of the unit.

1) List out age groups of population and defined working and non working population.

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2) Define Sex Ratio and describe its importance.

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3.9 LET US SUM UP

In this unit, we have discussed about the age and sex composition of the population structure which is important for all the teaching and research components of the population studies. Age sex pyramid shows the trends and pattern of population

growth along with sex ratio at birth. Dependency ratio is another component of population structure in the country which also indicates the facilities for elderly, children and working age population for care, education and employment respectively.

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3.11 CHECK YOUR PROGRESS - POSSIBLE ANSWERS

Check Your Progress 1

Q. Explain briefly concept of age and sex composition of population

A. age and sex composition is the barrow meter of the demographic data for any country. Both age and sex compositions are the best determinants of

the population growth which is influencing by birth rate, death rate and migration. Age composition is affected by war, famine, pandemic over the period of time. Sex composition is best indicator of fertility potential of the country.

Check Your Progress 2

Q. Describe population pyramid and its use in population policy

A. It is graphical presentation of the age and sex structure of the population of any country. Broad base of pyramid shows higher birth rate and sex ratio at birth while narrow base is indicating low fertility and proportion of elderly population in the country. Population pyramid is important to formulate policy on the basis of age structure and health policy for sex structure.

Check Your Progress 3

Q1. List out age groups of population and defined working and non working population

A. Basically four age groups have constructed based on the census data in India. These are 0-6 years, 0-14 years, 15-59 years, 60 years and above. These are groups called working and non working age population in the country. Working age population is 15-59 in Indian perspective and 15-64 at international perspective while non working age population is below 15 years and 60+ years population. Non working age population called dependent population on working age population which can be measure in the form dependency ratio.

Q2. Define Sex Ratio and describe its importance

A. Sex ratio is defined as number of female per 1000 male population in India while at global level is number of males per 100 female population. Sex ratio is the best indicator of fertility and potentiality of population growth. Sex ratio is used to formulate health policy for reproductive health and family planning in the country.