CHAPTER 1

INTRODUCTION
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Aging is unequivocally a universal and irreversible process. Aging presents many challenges to society and individuals. With gradual and sustained increase in life expectancy, the number of elderly, both relative and absolute, is increasing all over the world. With this increase, is emerging newer needs of this group, which are being felt in all sectors of human sustenance, be it health, social or economic etc. Aging is natural process, whereas old age is arbitrary. In the realm of social life, age serves not only to rank persons, hierarchically, but it also serves as a basis of prescribing or permitting various social roles. Aging process varies considerably within and between cultures. Getting old is the result of the interplay of biological, social, psychological and ecological factors. In the process of aging the last phase is considered as decline and death and in this phase a majority of the aged face economic, social, psychological and health problems, which of course, vary from individual to individual. Further, the determination of old age differ from society to society in accordance with the social organization including cultural beliefs in vogue on one hand and level of economy, standard of living and health services on the other (Riley et al., 1972; Muthayya and Annesuddin, 1992).

Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. The task of looking after the welfare of human beings, who are in need of physical, financial and emotional care, is a discouraging one for planners and policy makers especially in a country like India, where the majority of the population is barely able to live above the poverty line. One aspect of this welfare consists in providing affordable and adequate health care for the elderly, by taking into account the pathologies of old age. A second issue is the socio-economic vulnerability of the elderly (in addition to the physical problems of old age). Disease profiles are generally linked to the socio-economic status of the individual in an economy like India.
**Population Aging**

The age of population is on the increase world over in recent times. Advancement in medicare, improvement in living conditions and general quality of life and effective measure of birth control could be attributed for this emerging global phenomenon. A population is said to be aging in demographic terms, when the proportion of the older people increases and the proportion of youth and children decreases.

Population aging is the most significant result of the process known as demographic transition. Reduction of fertility leads to a decline in the proportion of young in the population. Reduction in mortality means a longer life span for individuals. Population aging involves a shift from high mortality/ high fertility to low mortality/ low fertility and consequently an increased proportion of older people in the total population. This trend is observed in many countries including India (Jhonson, 2008).

**Global scenario of aged population**

Worldwide the proportion of the people of aged 60 and over is growing as faster as than any other age group compared to the 200 million of 60 + aged, constituting 8% of the world population in 1950, it is projected that their population will rise to 1.2 billion constituting 14% of the world population by 2025, AD. Further, when we compare their distribution in developed and developing regions of the world, a phenomenal increase is estimated, whereby the aged population in developing regions is going to out number those in the developed regions, as could be seen from the following table.
Distribution of 60+ population (in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Developing regions</th>
<th>%</th>
<th>Developed regions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>200</td>
<td>Equal</td>
<td>50.00</td>
<td>Equal</td>
<td>50.00</td>
</tr>
<tr>
<td>1975</td>
<td>350</td>
<td>Equal</td>
<td>50.00</td>
<td>Equal</td>
<td>50.00</td>
</tr>
<tr>
<td>2000</td>
<td>614</td>
<td>370</td>
<td>60.26</td>
<td>244</td>
<td>39.73</td>
</tr>
<tr>
<td>2025</td>
<td>1200</td>
<td>858</td>
<td>72.00</td>
<td>342</td>
<td>28.50</td>
</tr>
</tbody>
</table>


It should be further noted that 60+ age group is not a homogenous group. The improved medicare facilities and living conditions are helping to extend the longevity of the individual well beyond 80 years in many parts of the world. These are categorized as very old or old-old. According to one estimate, in 1950 there were 23 million in the very old category among the elderly population, and it is estimated that by 2025 their number will raise to 137 millions.

Very - Old (80+) Age group (in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total in 80+ Elderly</th>
<th>% Among Elders</th>
<th>Developing Regions</th>
<th>%</th>
<th>Developed Regions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>23</td>
<td>7.00</td>
<td>15</td>
<td>65.26</td>
<td>8</td>
<td>34.78</td>
</tr>
<tr>
<td>2025</td>
<td>137</td>
<td>11.00</td>
<td>79</td>
<td>57.66</td>
<td>58</td>
<td>42.33</td>
</tr>
</tbody>
</table>


In developing regions, the growth of very old is by a factor of 15 compared to growth by a factor of 8 for the elderly population as a whole. Comparatively, in developed regions the growth of very old is by a factor of 79, compared to growth by a factor of 58 for the elderly population as a whole. Thus, in both developed and developing regions, the 80+ age group will grow nearly twice as fast as the 60+ age group (UN, 1992).
Distribution of world population over age 60 by region, 2002 and 2025 indicates that in terms of regions, over half of the world older people live in Asia. Asia’s share of world oldest people will continue to increase the most while Europe’s share as a proportion of the global older population will decrease the most over the next two decades.
The global age composition that is the proportionate number of children, young adults and older adults is shown in the above population pyramid. It is observed from the pyramid that there is a decline in the proportion of children and young people and an increase in the proportion of people age 60 and over. It is an important element for policy makers to take into account. As population increases, the triangular population pyramid of 2002 will be replaced with a more cylinder-like structure in 2025.

Countries with more than 10 million inhabitants (in 2002) with the highest proportion of persons above age 60

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>24.5%</td>
<td>Japan</td>
</tr>
<tr>
<td>Japan</td>
<td>24.3%</td>
<td>Italy</td>
</tr>
<tr>
<td>Germany</td>
<td>24.0%</td>
<td>Germany</td>
</tr>
<tr>
<td>Greece</td>
<td>23.9%</td>
<td>Greece</td>
</tr>
<tr>
<td>Belgium</td>
<td>22.3%</td>
<td>Spain</td>
</tr>
<tr>
<td>Spain</td>
<td>22.1%</td>
<td>Belgium</td>
</tr>
<tr>
<td>Portugal</td>
<td>21.1%</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>20.8%</td>
<td>Netherlands</td>
</tr>
<tr>
<td>Ukraine</td>
<td>20.7%</td>
<td>France</td>
</tr>
<tr>
<td>France</td>
<td>20.5%</td>
<td>Canada</td>
</tr>
</tbody>
</table>

Source: UN, 2001

Countries with more than 10 million inhabitants (in 2002) with the highest proportion of persons above age 60 indicates that until now, population aging has been mostly associated with the more developed regions of the world. For example, currently nine of the ten countries with more than ten million inhabitants and the largest proportion of older people are in Europe. Little change in the ranking is expected by 2025 when people age 60 and over will make up about one-third of the population in countries like Japan, Germany and Italy, closely followed by other European Countries.
### Absolute numbers of persons (in millions) > 60 years of age in countries with a total population approaching or above 100 million inhabitants (in 2002)

<table>
<thead>
<tr>
<th>2002</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>134.2</td>
</tr>
<tr>
<td>India</td>
<td>81.0</td>
</tr>
<tr>
<td>United States of America</td>
<td>46.9</td>
</tr>
<tr>
<td>Japan</td>
<td>31.0</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>26.2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>17.1</td>
</tr>
<tr>
<td>Brazil</td>
<td>14.1</td>
</tr>
<tr>
<td>Pakistan</td>
<td>8.6</td>
</tr>
<tr>
<td>Mexico</td>
<td>7.3</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>7.2</td>
</tr>
<tr>
<td>Nigeria</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Source: UN, 2001

Countries with more than 10 million inhabitants (in 2002) with the highest proportion of persons above age 60 are shown in the above table. It is observed from the table that about 70% of older people live in developing countries. These numbers will continue to rise at rapid rise.

### Indian Scenario of aged population

Population Aging which was perceived until recently to be a concern of the industrialized countries only has become an active issue of the developing countries. India as a part of developing countries is no exception, and has to face this gigantic challenge in the future by understanding the composition, characteristics, problems of the aged in the country, etc., as a pre-requisite for evolving appropriate strategies and programmes for taking care of their special needs as well as to arrest the possibilities
of social upheaval. The population of older Persons (60 +) in India ranks the fourth highest amongst the countries in the world and by the end of the present century, it will be second only to China (Government of India Report, 2000). According to the data available from the decennial census the number of aged has increased from about 19.6 millions in 1951 to 75.93 million in 2001 or by 287 percent over 50 years period.

Growth of elderly population aged 60 and over, by sex, in India 1901 – 2001.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population 60 + ( in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Persons</td>
</tr>
<tr>
<td>1901</td>
<td>12.06</td>
</tr>
<tr>
<td>1911</td>
<td>13.17</td>
</tr>
<tr>
<td>1921</td>
<td>13.48</td>
</tr>
<tr>
<td>1931</td>
<td>14.21</td>
</tr>
<tr>
<td>1941</td>
<td>18.04</td>
</tr>
<tr>
<td>1951</td>
<td>19.61</td>
</tr>
<tr>
<td>1961</td>
<td>24.71</td>
</tr>
<tr>
<td>1971</td>
<td>32.70</td>
</tr>
<tr>
<td>1981</td>
<td>43.98</td>
</tr>
<tr>
<td>1991</td>
<td>55.30</td>
</tr>
<tr>
<td>2001</td>
<td>75.93</td>
</tr>
</tbody>
</table>


Growth of elderly population aged 60 and over, by sex, in India 1901 – 2001 indicates that the growth rate of elderly Population is increasing gradually from 1901-2001. The old age dependency ratio (Number of old persons 60 + years) to the working age group (15-59 years) has increased from 9.8 percent in 1952 to 11.92
percent in 1981 and is projected to be 12.6 percent in 2001. The index of aging indicates that while in 1971 there were nearly 14.2 older persons for every 100 children, this figure rose to 24.7 per hundred children by 2001.

Consequences of population aging

Population aging is having profound effects on society. It is a quite almost an unseen social revolution that is gradually gaining pace and will accelerate and become ever more evident in the next 25 years. Life expectancy in India has almost doubled from 33 years at the time of Independence to the present 62 years and India is one of the few countries where the sex ratio is based favoring males at all ages. But the change now is visible in older age groups where women are out numbering men (Bagga, 1999).

There are three important consequences of population aging for the individual, for family structures and for social policy (Faith Robertson Elliot 1996)

- First, demographers argue that increasing longevity has reshaped the life course: that it has prolonged the post-childrearing stage of the life cycle, lengthened retirement, and made old age a long and distinctive period of life.
- Second, population aging, in conjunction with declining fertility, seems to have changed the shape of family structures.
- Third, population aging is generally interpreted as leading to rising levels of dependency.

Anthropology and aging

Gerontology is one of the most interdisciplinary scientific fields. Problems of aging are relevant to all branches of medicine and physiology as well as to anthropology, sociology, psychology, economics, and others (Borkan et al., 1982).
Anthropology is unique among the social and natural sciences in that it is concerned with formulating explanations of human diversity based on a study of all aspects of human biological and behavior in all the known societies (Haviland, 1989). Every living creature has got to pass through four characteristic phases of life cycle viz. birth, growth, decay and death. A socio-anthropological study establishes the fact that decay, the third characteristic mentioned earlier, has been recognized as old age in human society from the very beginning of social life (Haldar, 1998).

Anthropology and old age have been linked in many ways, which may be summarized as old age in anthropology, 'anthropology of old age', and finally, 'anthropology of age' (Arth, 1972; Clark, 1973; Goody, 1976; Holmes, 1976; Myerhoff, 1978).

**Biological aging and physical anthropology**

Aging is a continuous biological process that begins at birth. It is inevitable and irreversible but it is not a disease. The obvious characteristics associated with aging are death of billions of cells of the body and atrophy of various organs. The muscles lose their power and tonus, while the skin may wrinkle. There is a general slowing down of most of the bodily process and it is characterized physically by progressive decline in functioning of various organs (Arya, 2002). Most human physiological systems change continually over the lifespan. Patterns of change differ across organs, cell types, and metabolic systems.

**Primary aging and secondary aging**

Primary aging is dependent on intrinsic biological and genetic characteristics and the changes there in aging; and the secondary aging is the result of accumulated injuries and onslaughts because of diseases and disadvantages a person is exposed
over a period of time since inception and throughout childhood, adolescence, youth and adulthood. This could be in the form of diseases of childhood, nutrition, psychosocial stress, environmental hazards etc. As such the wide variation in the burden of disease and disability in elderly is primarily due to secondary aging and differentials in factors responsible for the same. However, it has been most difficult to distinguish processes attributable to aging from those attributable to disease (Kane and Kane 1981). The primary aging remains immutable, while the secondary process can largely be changed.

Research in gerontology to date, as would be expected is a relatively new discipline, has focused on describing normal aging and on differentiating it from disease. Little attention has been given to comparative studies of biological aging between individuals and populations, and through time. It is possible that lifestyle, diet, or genetic characteristics, which retard or accelerate aging, would be revealed by such studies and thus has major public health implications. Physical anthropologists are well equipped for this type of investigation because of their involvement in longitudinal and cross-sectional developmental research and have been contributing their mite. Typically they focus on interactions between biological cultural influences in development (Borkan, 1982).

Theories of aging

Many conditions that we associate with aging are, in fact, due to the impaired efficiency with which organs function. Deterioration of function finally reaches a threshold at which symptoms from joint pains to mental deterioration appear. Most theories of aging agree that these changes are due to the accumulation of irreversible damage in body tissues. In evolutionary terms, different species respond to their environment by prioritizing either tissue repair or reproduction and this choice determines the average life expectancy of that species (Perring, 2002).
With an electron microscope it is possible to see chromosomes within the cell nucleus. At the end of each chromosome lies a tail of proteins, called a telomere, which reduces with each cell division. When telomeres are reduced to a critical extent, cells stop dividing and die (apoptosis). Failure of that organ of the body then follows inevitably. This process occurs in all living cells (Perring, 2002).

The body repairs, in preference, those structures for which repair is economic and which are necessary for reproduction of the species. Body tissues, which are metabolically costly to repair include damaged DNA in the cell nucleus, damage to the chemical 'factories' (mitochondria) which control cell activity outside the nucleus and abnormal proteins accumulated within the cell and damaged by 'free-radicals'. Free radicals are chemically reactive molecules produced as by-products of all cell function (Perring, 2002). While normal repair processes mop up most, there is cumulative damage to cell components such as the cell membrane, DNA and other proteins. The free-radical theory of aging describes damage by free radicals as responsible for cancers, respiratory diseases, dementia, cardiovascular diseases and eye diseases. Exposure to toxins, infections, smoking and high saturated fat intake in the diet, increase production and damage by free radicals (Perring, 2002, Reddy et al., 1997).

The immune theory of aging states that immune function declines progressively as the thymus gland shrinks and its stem cells, those cells from which all other cells are derived, are no longer produced.

Whatever process dictates the particular mechanism of aging, there is a progressive and generalized loss of function, reduced ability to respond protectively to stress and a growing likelihood of clinical disease. How each of us ages is determined
not only by our genetic make-up but also by the extent to which early development occurs under optimal conditions. For instance the risk of diabetes or cardiovascular disease in the second half of life is strongly influenced by the adequacy of maternal nutrition during pregnancy (Barker, 1998).

As nations age, in parallel to changing living and working conditions, a shift in disease patterns becomes inevitable. These changes hit developing countries the hardest. Even as these countries continue to struggle with infectious diseases, malnutrition and complications from childbirth, they are faced with the rapid growth of non-communicable disease. This "double burden of disease" strains already scarce resources to the limit. The shift from communicable to non-communicable diseases is fast occurring in most of the developing world, where chronic illnesses such as heart disease, cancer, dementias and depression are quickly becoming the leading causes of death and disability. It is expected that this trend will escalate over the coming decades. In 1995, 51 percent of the global burden of disease in developing and newly industrialized countries was caused by non-communicable diseases, mental health disorders and injuries. By 2020 the burden of these diseases will rise to approximately 70 percent in them (WHO, 2001).

In both, developing and developed countries, chronic diseases are significant and costly causes of disability and reduced quality of life. An older person's independence is threatened when physical or mental disabilities make it difficult to carry out the basic activities of daily living such as bathing, eating, using the toilet and walking across the room, and the instrumental activities of daily living such as shopping and meal preparation. The likelihood of experiencing major disabilities dramatically increases in very old age (WHO, 2001).
Magnitude of disease and disability

Several features of the prevalence of disease and disability distinguish the elderly from the other segment of the population. The elderly often suffer from chronic degenerative diseases unlike the younger population. Elderly frequently suffer from multiple co-existent chronic conditions upon which acute illness are superimposed. Moreover, in elderly, diseases, which are self-limited in young often, produce devastating dysfunction, disability and sometimes death (Sharma. 1998).

Causes of Morbidity in Later Life

World Health Organization (1998) has listed major chronic conditions affecting older people worldwide as follows:

- Cardiovascular diseases (such as coronary heart disease)
- Hypertension
- Stroke
- Diabetes
- Cancers
- Chronic obstructive pulmonary disease
- Musculoskeletal conditions (such as arthritis and osteoporosis)
- Mental health conditions (mostly dementia and depression)
- Blindness and visual impairment

As per WHO (1998) among circulatory diseases, stroke and other cerebrovascular diseases are the second most common cause of death (first being CVD), accounting for more than 4.6 million deaths world-wide, one-third in industrialized countries, and the rest in developing countries. As is the case with, coronary heart disease (CHD), there is considerable geographical variation, in morbidity and
mortality occur mainly in the over 65-age group. Arteriosclerosis, deposition of cholesterol seen in blood vessels; commonly causes heart attacks and paralysis due to blood clot in the brain. Elevated serum cholesterol is common in older people and is a risk factor for CHD in both men and women, and this relationship persists into very old age. An increasing age is considered to be main risk factor for stroke and circulatory diseases; more generally, the burden of these diseases become heavier as greater proportions of the population in developing countries reach older ages.

Instances of heart diseases in India are not only rising at an alarming rate, but are also striking people at younger ages. According to the projections, by 2015, India will see twice the number of deaths due to cardio-vascular diseases. Already, there is a six -fold increase in instances of heart diseases in urban areas and a three-fold increase in rural areas (TOI, 1999). High blood pressure can damage several organs. It can lead to heart failure, strokes, kidney damage, peripheral arterial disease and also eye damage (Jain, 1999). Pressure to excel in what is essentially man's world and fulfill the traditional role as homemaker has taken a serious toll on the health of modern Indian men.

There are two types of diabetes, Type I and Type II. Those with Type I, most often seen in children and young people, cannot produce insulin and must inject themselves with insulin every day. Those with Type II popularly known as Maturity Onset Diabetes' produce insulin but their cells are unable to absorb efficiently sugar from the blood. Some cases of Type II diabetes can be managed with exercise and diet. About 2 per cent of the world's population suffers from one of the two forms of diabetes and nearly 3.5 million have Type I (Graves, 1999). Over 150 million suffer from Type II diabetes (Bezbaruah, 2003).
Asia faces an explosion in diabetes cases that will weigh heavily on the region's finances especially in China and India. The number of people with diabetes are expected to double by 2015 to between 215 million and 220 million, mostly in China and India. It is a tremendous challenge for countries like ours to deal with this situation as India being dubbed the Diabetes Capital of the World at the recent 2003 International Diabetes Forum held in Paris (Bezbaruah, 2003).

Estimates for 2025 are a staggering 57.2 million. Coupled with the fact that Indians are more prone to diabetes than their western counterparts, as in the case of heart diseases, only accentuates the problem. Over 90 per cent of the cases seen here are Type 2 diabetes, which hits those over above the age of 30 years. The long-term complications are traumatic and often life threatening. Diabetes affects the small vessels leading to retinopathy and nephropathy or the large vessels leading to heart ailments, strokes or even blocking off blood circulation in other body parts such as the legs leading to amputation, a very common occurrence in India. The "thrifty gene" concept also finds a special meaning in the Indian context. Most Indians are born with the gene, which makes them more prone to develop diabetes. Rich diets and sedentary lifestyles make them prime candidates to fall prey to this silent killer (Chaudhuri, 1999).

Non-insulin dependent diabetes mellitus (NIDDM) is one of the most serious diseases among certain ethnic groups. Mc-Cay and associates (Kriska et al., 1993) first reported the incidence of NIDDM in Bengalis of Indian regions. Several authors reported association of various factors with NIDDM. These include increased body mass index, age, hypertension, male gender, urban living, vegetarianism and income (Zimmet et al., 1981). A decreased risk for NIDDM with increased physical activity was also observed (Kriska et al., 1993).
The gradual elimination of other fatal diseases, combined with rising life expectancy, means that the risks of an individual developing cancer during his or her lifetime are steadily increasing. Most cancers arise at an advanced age, and the risk increases steeply with age. The cancer burden is therefore, much more important in population having long life expectancy, relative to other groups of diseases.

It is muscle, which helps us maintain our independence. If we are unable to get out of an arm-chair because the quadricepses in our thighs are wasted we dependent on others to move us (Perring. 2002). Certain musculo-skeletal conditions add to the disability burden among the elderly, some of which are discussed below:

Arthritis is among the oldest known afflictions of human beings. It has been found in mummies of Egypt and in skeletons in excavations of other ancient civilizations. The word arthritis comes from arth, which means the joint, and its, which means inflammation. It is a diffuse lesion (an alteration in condition of the tissue due to various reasons) affecting the joint as a whole. Arthritis occurs due to a degenerative wear and tear occurring in the joint (Endurance Fitness Club, 2002).

Arthritis is a growing problem among many old and middle-aged people. Often the world arthritis itself paints a gloomy picture and there is phobia among the patients that its onset means end of life for them. When it is not treated at the right time, arthritis can cause irreversible changes and deformity to the body.

In layman's understanding arthritis can be acute, for example rheumatoid arthritis or chronic degenerative condition like osteoarthritis. In India, osteoarthritis is seen to affect the knees most in contrast to western countries where the hip is affected. More uncommonly it can affect the spine and other joints like shoulders. It is a wear
and tear disease initially being a nuisance factors, later becoming a source of disablement. There is no one definite cause for its onset. It has multi-factorial aetiology like hereditary predisposition, excessive weight and or osteoporosis (Tiku, 2002).

Some different types of arthritis are rheumatoid, tubercular and gout. Osteoarthritis is the most common one. Among the types of arthritis the most common and affecting the elderly is the degenerative forms of osteo-arthritis affecting the discs and causing even cervical spondylitis. Symptoms of arthritis include pain, loss of movement, stiffness and swelling in the joints and snapping of joints.

The elderly have a number of health problems and majority of them are chronic in nature. The progressive debilitation of functional capabilities is accentuated by factors such as padual decline in vision accompanied by other eye problems such as presbyopia, dry eyes, excessive tears, seeing floaters; eye diseases like retinal disorders, cataract, glaucoma; hearing impairment ranging from difficulty in understanding words or hearing certain sounds, total deafness; disorders of digestive tract like milk intolerance, flatulence, and constipation (WHO, 1997).

Hearing is actually the first faculty to be affected with advancing age. Sensori-neural deafness is particularly common among elderly and is important. It typically results in preferential loss of high frequency hearing (Sinclair and Dangerfield, 1998).

By the age of 70, over 90 percent of people have some degree of opacity of lens (senile cataract), possibly as a result of its continued growth being restrained by a tight capsule, so compressing the nucleus and the surrounding fibers, which eventually coalesce (unite) into a homogenous mass. Another type of senile cataract
results from the accumulation of fluid among the peripheral fibers, forcing them apart (Sinclair and Dangerfield, 1998). Macular degeneration is the leading cause of severe vision loss in the elderly. The condition, a deterioration of the retina affects an estimated 25 per cent of Americans over the age of 65 (Pollack, 1999). These are major causes of visual disability in older people, especially in developing countries like ours where there are fewer resources for prevention and treatment (WHO, 1997).

Human digestive system performs the amazing task of breaking down the food we eat, into the nutrients our bodies need. Most of the time this system stays remarkably free of trouble. As we grow older, however, our body begins to work less efficiently in some ways, and our life style may also change. As a result, we may have digestive problems. For example, as age increases the problem of constipation becomes more chronic, especially in the old. (Moulick, 1999).

Digestive problems are common in those over age sixty. Half the population over age sixty does not make enough stomach acid to digest their food adequately. All digestive secretions diminish as we age. The sense of taste and smell declines with age which leads to a loss of interest in food. As a result, many of the elderly are undernourished or even malnourished (unbalanced diet). The impact of malnourishment on quality of life is enormous and can result in fatigue, diminishing resistance to infection and even depression.

Micturition (Urination) is a voluntary phenomenon, primarily under the control of autonomic nervous system. The involuntary loss of urine is known as urinary incontinence, which is common in the elderly. The dictionary meaning of incontinence is the inability to control bowel and the bladder. When it concerns the involuntary loss of urine, the phenomenon is called urinary incontinence (Patnaik, 1999).
Falling attacks also contribute to the incident of bone fractures. Falling attacks or drop attacks have been often referred to a special place in geriatric medicine ever since they were described with persuasive brilliance (Bagga, 1994). She suggested that drop attacks or sudden falls occurring without any warning and without loss of consciousness were a specific entity and has as a further characteristic, a peculiar form of difficulty in getting up from the ground again due to a temporary loss of muscle tone which is reverted back to normal once the person stands up (Hodkinson, 1980).

Aging and age related changes of the skeleton and bone tissue represent an organic part of the general process of aging. The aging of bone may serve as a model of general aging of an organism, since there is a strong correlation of skeletal age-related changes with similar changes in many vital functions of different systems of organism, e.g. Cardiovascular, integumental, visual, and locomotor (Ostlere and Gold, 1991). If the aging of an organism may be 'healthy' that is free from unfavorable consequences of functional impairment, bone aging may be detrimental and may impact the normal functioning of other systems of organism, for example, peripheral nerves and vertebral arteries due to deformations of spinal column (Karasik et al., 2000).

The updated World Health Organization (1995) 'Health for All' or 'Healthy Aging' emphasizes the importance of improving the quality of life in old age, to which good health makes a major contribution. However good health cannot be judged simply in terms of the absence of disease and disability, but needs to take into account the overall well-being, thus embracing physical, mental and social aspects (WHO, 1994).
Socio-demographic factors influencing health in old age

Old age is a crucial stage in one's life. It brings lot of difficulties, hardships and adjustment problems. Because of physical and psychological constraints a person experiences sense of deprivation, inadequacy and incompetence. One of important feeling that arises during old age is the lack of support - psychological, social and physical (Quraishi & Arora, 1999). With enormous pressures on housing and space, the older people are relegated to a lesser position. Lower income levels marginalize them even further. Modern living and its technology render the wisdom and knowledge of the older people to an insignificant level. In such a cultural setting, the elderly are seen negatively. Such a perception is bound to accelerate their aging, significantly.

Socio-cultural factors such as marital status, living arrangements, and inadequate resources create many dysfunctional features of old age (Bagga, 1999). The greater longevity of married as compared with unmarried persons has been repeatedly demonstrated by studies dating back to the mid-1800s. It is now well known that health status and health utilization as well as mortality, differ systematically by marital status for both sexes (Hu & Goldman, 1990). Though the relationship between elderly well-being and their marital status cannot be spelt out promptly, any change in the marital status composition affects quality of life in old age. Widowhood not only brings bereavement but also an associated loss of status, discrimination, loss of economic power and loss of identity (Jamuna, 1995).

The International Year of the Elderly and the motto of the World Assembly on Aging, namely, "Add life to years," brought to the fore welfare needs in India. Traditionally, children are expected to take care of their parents in old age. In fact,
this has been contributing factor to population growth in India. Even today, a valued asset in old age is care by offspring; the more number of off-springs, the greater the chance of better care in old age (Ramamurty & Jamuna, 1993). But in recent times the traditional family structure in India is undergoing drastic changes. Increasing urbanisation, industrialisation, migration and many such social changes have chipped steadily at our joint family system. The once important community and caste networks that sustained older people within the family are breaking down at a rapid pace. Family nucleation and separation of children from parents have spawned a situation where older parents are forced to stay on their own even when this is the last option they would prefer (Prakash, 1999). There is sufficient evidence that the much talked about oriental tradition of filial piety is being replaced rapidly by more modern individualistic values. The status and prestige of older people has diminished erecting their life satisfaction and quality of life (Kumar, 1996).

In the developed countries, overall declines in mortality have led to joint survival of increasing numbers of generations within families, while declines in fertility have depressed the numbers of same generation kin existing at any given time. Bengston, Rosenthal and Burton (1990) refer to this as the beanpole family in India extended families are still common, although they are more likely to be horizontally than vertically extended, since continued high fertility means that numbers of same age peers, such as siblings and cousins, still proliferate. As more persons survive to older ages, the family system in developing regions will inevitably see longer periods with three or even four generations coexisting (Kanwar & Chadha, 1998).
The finding that majority of depressive elderly patients come from "not at all" joint type of family setup is an indication that physical composition of families play an important role in the quality of mental health of the elderly (Bengston et al., 1990). The choice of a living arrangement - as an independent household, together with adult children or other related or unrelated persons, or in an institution - strongly influences the psychic and economic well being of an elderly person. The choice of a living arrangement has many implications for the well being of an elderly person. Changes in living arrangement are likely to be associated with changes in the level of care and assistance received by the elderly.

People enter special living settings because these arrangements allow them to satisfy basic needs more economically and efficiently than is otherwise possible. The setting is presumed to offer them the services and tools for living at less cost in energy and with greater satisfaction than was possible in their own houses, even if they were assisted by friends and relatives such a step represents an effort to conserve energy in the face of real or anticipated impairments and development in physical energy. In addition it represents a break with past concepts of self and forces upon the person, often for the first time, the recognition of the severe limitations of old age (Kanwar & Chadha, 1998).

Thus entry into special settings represents a turning point in life and is commonly a decision, thrust upon a person by unfavorable circumstances. This is clearly shown in the attitudes of people in homes for the dependent aged. Even when the institutional setting approaches the ideal, residents often feel called upon to explain to friends or acquaintances the circumstances necessitating their entry into the home. Thus it seems that negative valences tend to predominate the decision to enter a special setting. This arises not only because a person faces the unwelcome fact of an age change in himself, but also because of the generally negative public attitudes.
towards congregate, segregate and institutional settings for the aged (Kanwar & Chadha, 1998).

Research on living arrangements and well being of the elderly in Asia is not extensive. Many details regarding factors leading to co-residence, reciprocal support, expectations of people co residing are yet to be understood (Domingo, 1995). Gender is another important determinant of co-residence.

Education is a crucial factor that enhances the social status of people. The levels of literacy are low in most developing countries, India being no exception. Education is viewed as a tool for empowerment of family. Lack of marketable skills and training condemns especially elderly to low status, unskilled or semi skilled jobs in unorganized sector. (Prakash, 1996). An earlier study by National Institute of Mental Health, Baltimore, Maryland, United States of America has clearly linked better health in old age (self reported) with better income and education (Willis, 1994).

It has been well emphasized by some researchers in the field (Troisi, 2001) that socio-economic implications of population aging go beyond demographic data, statistics and projections (Troisi, 2001). In developing countries socio-economic development has often not kept pace with the rapid speed of population aging. For example, while it took 115 years of the proportion of older people in France to double from 7 to 14 percent, it will take china only 27 years to achieve the same increase. Thus, while developed countries grew affluent before they became old, developing countries like India are growing old before a substantial increase in wealth occurs (WHO, 2001).

Low income, regardless of age, has been strongly related to health problems. In the mid 70s about three times as many poor as affluent had their activities restricted by chronic disease. Since poverty is widespread problem among the elderly, their
health problems are compounded by it. Poverty affects every aspect of life, including nutrition. Good health is difficult to maintain without adequate resources.

Need to undertake the present study

In view of the increasing percentage of the elderly people both in terms of absolute and relative numbers, biological make-up and socio-cultural status, there is a considerable potential to study this vulnerable group, regarding the various problems faced by them and to draw suitable measures for their well-being. The findings of the studies on elderly will help in better understanding of the aged individuals and have been of great value in making their lives more successful and happier. Global self-ratings of health are among the most commonly assessed and simplest measures for ascertaining an individual's health. Self-rated health has been shown to be an independent predictor of survival among the aged. In India aging is relatively an unexplored area of research. Research is gaining momentum on aging in the recent times and hence literature on aging is scanty in the Indian context. To the best of our knowledge, only two studies (one from North India: Bombay slums and second one from South India: poorer sections of Andhra Pradesh) are available on the elderly population's perception of self-rated health and nutritional status from the Indian context. But no studies are available on tribal populations, though their size is also increasing significantly on par with other populations.

Hence there is a dire need to know the health status of the tribal populations and such measures will pave the way for the construction of welfare measures towards their well-being. In the light of this background the present study is aimed to assess the relationships between nutritional status with functional ability, well-being
and self-rated health in a free living elderly subjects from two major tribal communities, i.e., the Sugali and the Yanadi tribes of Andhra Pradesh, India.

The specific objectives of the study are

1. To assess the demographic characteristics of the two tribal communities.

2. To assess the nutritional status based on anthropometry among the elderly subjects.

3. To assess the self-rated health among the elderly.

4. To know the functional ability and well-being among the two tribes.

5. To know the prevalence of diseases.

6. To assess the relationship of self-rated health to functional ability and nutritional status among the elderly and:

7. To compare the results between the study tribes to develop suitable strategies for their well-being.