The State of Ageing and Health Situation in Kerala

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Introduction

Population ageing is one of humanity's greatest triumphs. Ageing is a privilege and societal achievement. The ageing of the global population is one of the biggest challenges, which will impact on all aspects of 21st century society. Ageing is a slow but dynamic process which involves many internal and external influences, including genetic programming and physical and social environments (Matteson 1996). Ageing is a lifelong process. It is multidimensional and multidirectional in the sense that there is variability in the rate and direction of change (gains and losses) in different characteristics for each individual and between individuals. Each period of life is important. Health is vital to maintain well-being and quality of life in older age, and is essential if older citizens are to continue making active contributions to society.

Maintaining good health is the most important pre-requisite for every persons reach and enjoys an active and comfortable old age. One of the main causes of ageing namely, the longevity comes from the good quality of health. Longevity without quality is an empty box. The health care of the elderly becomes very important since they are more prone to illness than young ones and they are also liable to domestic and other accidents (WHO, 1998).

Compared to the developed world, socioeconomic development in developing countries has often not kept pace with the rapid speed of population ageing. In most of the developed world, population ageing was a gradual process following steady socio-economic growth over several decades and generations. In developing countries, the process is being compressed into two or three decades. Thus, while developed countries grew affluent before they became old, developing countries are getting old before a substantial increase in wealth occurs (Kalache and Keller, 2000). Rapid ageing in developing countries is accompanied by dramatic changes in family structures and roles, as well as in labour patterns and migration. Urbanization, the migration of young people to cities in search of jobs, smaller families and more women entering the formal workforce mean that fewer people are available to care for older people when they need assistance. In all countries and in developed countries in particular, measures to help older people remain healthy and active are a necessity, not a luxury.

Population ageing is the most significant result of the process of demographic transition. Reduction of fertility leads to a decline in the proportion of the young in the population. Reduction in mortality means a longer life span for individuals. Population ageing 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. India is undergoing such a demographic transition.

India has the second largest number of elderly in the world with as many as 77 million as compared to China's 127 million. In a span of 50 years (1961-2001) India's elderly population increased from 25 million to 76 million. This figure is expected to increase to 301 million in 2051. Around 75% of the Indian elderly live in rural areas.

Among the Indian States, Kerala has the higher proportion of elderly population. According to 1991 census the number of elderly was 2.6 million and which now increases to 3.3 million in 2001 census. In the State, the total population is expected to grow at a slower pace in the future, the growth rate among aged is expected to increase higher and higher. Again, among all the age group of the population the fastest growing groups are the old old. We know old people have everyone's attention due to their weak and problematic living conditions.

The traditional family norms and values were a great source of security and care for the aged persons. Joint family met the social, economic and emotional needs of its members. The breakdown of Joint family system, selfishness, lack of adjustment, refusal to compromise and with more and more young women entering into jobs, care and attention given to the elderly persons is becoming difficult.

Health Surveys in Kerala show that the incidence of chronic and degenerative diseases is increasing very fast this has called for a shift in the technology and management of health care. Diabetes, Hypertension, Cardiovascular diseases, Cancer etc. have been found to be progressively increasing in Kerala. There is, now an 'expansion of morbidity' where old age is characterized by long period of illness which may not be very serious nature. This means that the longer a person lives, the longer he will lives with illness. That is, we extent our life years at the cost of disability. In an ageing society like Kerala morbidity status and health care are becoming serious problem. Hence it is very relevant to study the prevalence of chronic ailment during ageing in different demographic and socio-economic groups.

Objective

The main objective of the study is to analyze the prevalence of chronic ailment during ageing in different demographic and socio-economic groups.

Data and Methodology

Data

Since secondary data is not available for this type of study, it is necessary to collect data from elderly persons directly. Hence the data were collected from one ward in urban area and two wards in rural area. In urban area the data were collected from 957 households and among them 731 elderly identified. In rural area the data were collected from 788 households and among them 400 elderly were identified. The wards were selected using simple random sampling.

Methodology

Survival analysis has been utilized to understand the risk of having functional disability among the aged population in the sample. The main techniques from the survival analysis used for the current investigation are life table technique and proportional hazard model.

Life table technique: A detailed explanation of procedure for constructing life table is discussed elsewhere (Ramkumar, 1986; Namboodiri and Suchindran, 1987). A very few have experienced some forms of disability before age 60, here made an assumption that for them the age of disability was at age 60. In this analysis an event considered is the respondents have experienced any functional disability or not. Those who did not experience the disability

(terminal events) are considered as censored cases. A brief description of the life table function used in the analysis is given below.

Column 1: Age interval (duration of survival) each age interval is classified as five year age group (60+)

Column 2: Actual number entering this interval (l_x).
It gives the actual number of elderly who enters into the above age interval without censoring or experiencing the terminal events.

Column 3: Number withdrawn during this interval (censored (Cx))
It shows the number of right- censored cases. The numbers withdrawn during the interval are those cases that do not experience the terminal event during the time of the survey.

Column 4: Number exposed to risk (l_x').
It gives the number of elderly who are exposed to the risk of disability.
$l_x' = l_x - C_x/2$.

Column 5: Number of terminal events (d_x)
That is the number getting the disability in the interval.
${}_nd_x = {}_nq_x * {}_nl_x$

Column 6: Proportion terminating (probability of having disability) in each age interval.
${}_nq_x = {}_nd_x / {}_nl_x$

Column 7: The probability of surviving (${}_nP_x$)= $1-{}_nq_x$.

Column 8: Survival function (S_x).
It is estimated by computing the continued product of Pi's
Thus S (1) = 1
S (2) = P1
S (3) = P1*P2……
S(i) = P1*P2*…….Pi-1 (i=1,2,. 3……..)

Column 9: The probability density function (f_x)
$f_x = (S_x - S_{x+n})/n$, where n-is the age interval

Column 10: Hazard Rate (λx)
The hazard rate expresses the instantaneous risk of having the event (disability) in each age interval, given that the event do not occur before age x.
i.e $\lambda x = f_x/S_x$.

The Proportional Hazard Model: The life table, as a single state survival model, helps us to identify important correlates of failure times. However, the model does not allow, seeing the covariate effects on failure time in a multivariate context. The Proportional hazard model proposed by Cox in 1972 was a major attempt to overcome the above drawback.

This model allows the formulation of relations between a set of covariates and the survival function as in the conventional multiple regressions. Here, duration of survival of each

individual is taken as the dependent variable. The independent variables taken in this analysis are marital status, education, occupation, income, health status, participation in the house hold and social and religious matters, feeling of loneliness, bad habit, family interaction any death in the family, religion and type of family. The variables used for the study are sets of categorical dummy variables.

The proportional hazard model is given by,

$\lambda(t, X_k) = \lambda o(t) \exp (X_k,\beta_k)$, where $\lambda (t, X_k)$ is the hazard rate at time t, $\lambda o(t)$ is the base line hazard function, β_k the vector coefficient and X_k is a vector covariates.

Analysis

Age and Sex Composition of the Elderly

The age-sex structure represents one of the most fundamental characteristics of population composition. The age-sex structure is governed by the degree of variations of the immediate preceding and long events that occurred in the society. Age structure is a crucial component in demographic analysis as it provides a quick and ready tool for mapping the broad contours of demographic history of a population. Similarly, the future demographic events are influenced to a large extent by the present age-sex structure, other things being constant. Age data is important in the sense that most of the socio-demographic analysis is performed according to age and sex variables.

There were 7188 people living in 1745 households in the study area. Out of this 1131 elderly were identified (i.e., age 60 and above). From Table 1 it is clearly evident that, about 16 percent of the population are elderly people. The share of elderly to total population is 15.73 percent, which is higher than the State average of 10.84. In the urban area, nearly 20 percent of the population are elderly which is higher than the State figure of 10.52 percent. In rural area, the share of elderly are 11.5 percent, which is also slightly higher than the State figure of 10.36 percent. Further, it can be clearly evident that about 65 percent of the household have atleast one elderly. This clearly indicates the rapid growth of elderly in the State.

Table 1
General Profile of the Elderly in the Study Area

	Total Number of Households	**Total Population**	**Total Number of Elderly Population**	**Percentage of Elderly Population**
Rural	788	3490	400	11.46
Urban	957	3698	731	19.77
Total	**1745**	**7188**	**1131**	**15.73**

The age and sex distribution of the aged population is given in Table 2. Out of the 1131 respondents about 33 percent are in the age group 60-64 and nearly 90 percent are in the between the age 60 and 80 years. About 10 percent are of the age 80 years or above. The overall sex ratio is 1071, which is less than the State ratio of 1229. Among old-old the sex ratio is very high (i.e., 1568) which is higher than the State ratio (1472).

Table 2
Percentage Distribution of Elderly by Age and Sex

Age-Group	Sex		Total	Sex Ratio
	Male	Female		
60-64	196	180	376	**918**
	35.90%	30.80%	33.20%	
65-69	135	141	276	**1044**
	24.70%	24.10%	24.40%	
70-74	107	132	239	**1234**
	19.60%	22.60%	21.10%	
75-79	63	63	126	**1000**
	11.50%	10.80%	11.10%	
80-84	31	33	64	**1065**
	5.70%	5.60%	5.70%	
85-89	10	27	37	**2700**
	1.80%	4.60%	3.30 %	
90+	4	9	13	**2250**
	0.70%	1.50%	1.10%	
Total	**546**	**585**	**1131**	**1071**
	48.30%	**51.70%**	**100.00%**	
	100.00%	**100.00%**	**100.00%**	

Marital Status

The distribution of elderly by their marital status is given in Table 3. 65 percent of the elderly are currently married. Among males 89 percent are currently married but in the case of females it is only 43 percent. 32 percent of the elderly are either widows or widower. Here the widows come around 54 percent and widower only 8.6 percent. As the life expectancy of the females are higher than males (on average six years difference) in Kerala the proportion of widows are on increasing over the years. Further among women 3.6 percent are either single or divorced or separated the corresponding figure for males is only 2.6 percent. This finding clearly indicates the seriousness of the elderly problem particularly that of elderly women.

Table - 3
Percentage Distribution of Elderly by Marital Status

Marital Status	Sex		Total
	Male	Female	
Married	485	249	734
	88.80%	42.60%	64.90%
Widowed/ Widower	47	315	362
	8.60%	53.80%	32.00%
Single/ Divorced/ Separated	14	21	35
	2.60%	3.60%	3.10%
Total	**546**	**585**	**1131**
	48.30%	**51.70%**	**100.00%**
	100.00%	**100.00%**	**100.00%**

Education

The distribution of elderly by their level of education is given in Table 4. It is found that nearly 10 percent are illiterate, among females it is 15 percent and males it is only four percent. 15 percent have primary and middle level of education; here the females are more in number. Nearly 45 percent have high school level of education, among women it is 42 percent and 48.5 percent among males. Further, 30 percent of the respondents have education of high school and above. In this case 39 percent are male and 21 percent are females.

Table - 4
Percentage Distribution of Elderly by Education

Educational Qualification	Sex		Total
	Male	Female	
Illiterate	22	88	110
	4.00%	15.00%	9.70%
Primary	46	125	171
	8.40%	21.40%	15.10%
High School	265	247	512
	48.50%	42.20%	45.30%
Up to Degree	130	101	231
	23.80%	17.30%	20.40%
Others	83	24	107
	15.20%	4.10%	9.50%
Total	**546**	**585**	**1131**
	48.30%	**51.70%**	**100.00%**
	100.00%	**100.00%**	**100.00%**

Religion

Religious composition of the elderly is given in Table 5. Out of the total 1131 elderly - 75 percent belongs to Hindu community, 20 percent Christian and five percent are Muslims.

Table - 5
Percentage Distribution of Elderly by Religion

Religion	Sex		Total
	Male	Female	
Hindu	402	448	850
	73.60%	76.60%	75.20%
Christian	115	113	228
	21.10%	19.30%	20.20%
Muslim	29	24	53
	5.30%	4.10%	4.70%
Total	**546**	**585**	**1131**
	48.30%	**51.70%**	**100.00%**
	100.00%	**100.00%**	**100.00%**

Type of Family

The distribution of elderly by type of family in which they are living are given in Table 6. Nearly half of the respondents are living in nuclear families and about 47 percent in joint families and three percent living as single. In the case of males, nearly 55 percent living in nuclear families, 44 percent in joint families and one percent as single. Among women 44 percent in nuclear families, 51 percent in joint families and five percent living as single.

Table - 6
Percentage Distribution of Elderly by Type of Family

Type of Family	Sex		Total
	Male	Female	
Joint Family	238	298	536
	43.60%	50.90%	47.40%
Nuclear Family	301	258	559
	55.10%	44.10%	49.40%
Single	7	29	36
	1.30%	5.000%	3.20%
Total	**546**	**585**	**1131**
	48.30%	**51.70%**	**100.00%**
	100.00%	**100.00%**	**100.00%**

Occupation

The occupational distribution of the elderly is given in Table 7. It is evident from the study that there are considerable variations in the occupational status of males and females. Half of the respondent reported to have no work, 42 percent are pensioners, three percent are engaged in business and allied works and five percent are coolie workers. Among men 62 percent are pensioners, 22.5 percent have no job and 11 percent are doing coolie and other works. In the case of elderly women three fourth of the women have no job and only 22 percent are pensioners. From this one can expect the pathetic situation elderly women.

Table - 7
Percentage Distribution of Elderly by Occupation

Occupational Status	Male	Female	Total
No Job	**123** (22.50%)	**443** (75.70%)	**566** (50.00%)
Private job	**24** (4.40%)	**10** (1.70%)	**34** (3.00%)
Pensioners	**340** (62.30%)	**130** (22.20%)	**470** (41.60%)
Others	**59** (10.80%)	**2** (0.30%)	**61** (5.40%)
Total	**546** (100.00%)	**585** (100.00%)	**1131** (100.00%)
	48.30%	**51.70%**	**100.00%** (1131)

Health Status

The self rated health condition of the elderly is given in Table 8. It is found from the study that nearly 6 percent of the elderly reported their health status as very poor. 29 percent of them reported their health condition as poor, another 29 percent of the elderly reported as satisfactory. 36 percent of them reported as good. The perception about poor health is more among elderly women than men, while the perception about good health is more among elderly men.

Table - 8
Health Condition of the Elderly

Health Condition	Number	Percent
Good	409	36.2
Satisfactory	332	29.4
Poor	328	29
Very Poor	62	5.5
Total	**1131**	**100**

Chronic Ailment

With the continuing growth of elderly populations in modern societies, it has become a matter of increasing urgency to look for ways to maintain and improve the functional abilities of ageing people, to help them cope independently in the community and ultimately, to raise the quality of their lives. As more people reach a 'ripe old age', they also enter a period in their lives when they are at higher risk of developing chronic diseases, which in turn may result in disability. In fact, chronic diseases like hypertension, diabetes and cancer are predicted to be the main contributors to the burden of disease in developing countries by 2020. Infectious diseases – although declining – will continue to add to the burden of disease in those regions.

Women and men age differently. First of all, women live longer than men. Part of women's advantage with respect to life expectancy is biological. Far from being the weaker sex they seem to be more resilient than men at all ages, but particularly during early infancy. In adult life too, women may have a biological advantage, atleast until menopause, as hormones protect them. Currently, female life expectancy at birth ranges from just over 50 years in the least developed countries to well over 80 in many developed countries, where the typical female advantage in life expectancy ranges from five to eight years. As a result, the oldest old in most parts of the world are predominantly women. However, longer lives do not necessarily translate into healthier lives and patterns of health and illness in women and men show marked differences. Women's longevity makes them more likely to suffer from the chronic diseases commonly associated with old age. It is clearly evident from Table 9 that out of the total sample population, nearly 66.6 percent (753) reported to have one or more chronic disease. Among males the corresponding figure is 62 percent while for females it is around 71 percent. That is, of the total respondents who reported to have a chronic ailments 55 percent are women and the remaining 45 percent are men.

The percentage distribution of elderly according to the various types of chronic diseases is also given in Table 10. The major chronic problems are diabetes and blood pressure. Of the 753 cases those who reported to have a chronic ailment 59 percent have blood pressure and about 40 percent have diabetes. It was also noted that 10 percent have cardiac problem. The sex difference in the prevalence of illness is also observed that the females are more than males in most of the diseases. It is also found that nearly 240 elderly have more than one disease, of which 60 percent are women and 40 percent are men.

Table - 9
Percentage Distribution of Respondent by Chronic Ailment

Chronic Ailment	Sex		Total
	Male	Female	
No	207	171	378
	54.80%	45.20%	100.00%
	37.90%	29.20%	33.40%
Yes	339	414	753
	45.00%	55.00%	100.00%
	62.10%	70.80%	66.60%
Total	546	585	1131
	48.30%	**51.70%**	**100.00%**
	100.00%	**100.00%**	**100.00%**

Table - 10
Percentage Distribution of Elderly according to different Chronic Ailment

Disease	Number	Percent
Paralysis	23	3.05
Rheumatism	39	5.18
Diabetes	304	40.37
Blood Pressure	442	58.70
Cholesterol	34	4.52
Asthma	64	8.50
Heart problem	77	10.23
Leg pain	88	11.69
Kidney problem	6	0.80
Ulcer	6	0.80
Mental problem	2	0.27
Head ache	5	0.66
Cancer	6	0.80
Parkings	2	0.27
Epilepsy	3	0.40

Functional Disability

Research on ageing has traditionally been concerned with health, but recently the concept of functional capacity has also been attracting growing attention. The functional ability of elderly people is crucial to how well they cope with activities of daily living, which in turn affects their quality of life. Functional status can be defined as a person's ability to perform the activities necessary to ensure well-being. It is often conceptualized as the integration of three domains of function: biological, psychological (cognitive and affective), and social.

Functional competence has also been defined as the degree of ease with which individuals think, feel, act, or behave in congruence with their environment and the expenditure of energy. Functional health has also been associated with quality of self-maintenance, quality of role activity, intellectual status, emotional status, social activity and attitudes towards the world and self. Health and functional ability are crucially important to the quality of people's social lives: level of functional ability determines the extent to which they can cope independently in the community, participate in events, visit other people, make use of the services and facilities provided by organizations and society, and generally enrich their own lives and those of the people closest to them. Population groups within the same country often remain divided by significant disparities in morbidity, mortality and functional ability.

The percentage distribution of elderly having functional disability is given in the Table 11. It can be seen that about 10 percent of the elderly have severe functional disabilities. Here severe functional disability means bed ridden, paralysis and other type of disabilities which affect daily activities. This does not include physical disabilities (old age problems) like poor vision, sleeping problem, hearing problem etc. Of total 111 elderly those who have functional disability 78 are women and 33 men. This finding also underlines the fact that although women live longer than men, they tend to experience more disabling diseases as they grow older compared with men of the same age. There is also a wide variation in the perceived need for certain functional abilities among older people. Maintaining maximum functional capacity is as important for older people as freedom disease.

Table - 11
Distribution of Elderly Having Functional Disability
(Need help for daily routine)

Functional Disability	Male	Female	Total	Percent
Yes	33	78	111	9.8
No	513	507	1020	90.2
Total	**546**	**585**	**1131**	**100**

Survival Analysis

Life Table Technique

The occurrences of functional disabilities are considered as terminal events for the analysis. Out of the 1131 elderly people 376 are in the age group 60-64, of this, 24(3 percent) had the

experience of getting any form of functional disability. The probability density is 0.005 at the age group and the hazard rate is 0.0052. From the table it can be seen that the probability density function and the hazard rate are increasing with age. That is, as one expected their chance of getting the incidence of functional disability increasing with age. It was clearly evident from the analysis that the probability density function is very high for 80+ group, which gives the idea that the risk of having functional disability is utmost in this group. Hazard rate is also very high among this age group. This also reveals the fact that after age 80, the risk of getting functional disability is very high. The median survival time is 29 years. That is, in this sample population, the median years of life to those who had completed 60 years of age without getting any functional disability is 29 years.

Table - 13
Results of Life Table Analysis - Total

Interval Start Time	Number Entering Interval	Number Withdrawing During Interval	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating	Proportion Surviving	Cumulative Proportion Surviving at End of Interval	Probability Density	Hazard Rate
60 - 64	1131	352	955.000	24	0.03	0.97	0.97	0.005	0.0052
65 - 69	755	259	625.500	17	0.03	0.97	0.95	0.005	0.0052
70 - 74	479	217	370.500	22	0.06	0.94	0.89	0.011	0.0117
75 - 79	240	109	185.500	17	0.09	0.91	0.81	0.016	0.0176
80 - 84	114	47	90.500	17	0.19	0.81	0.66	0.030	0.0370
85 - 89	50	26	37.000	11	0.30	0.70	0.46	0.039	0.0557
90 - 94	13	9	8.500	3	0.35	0.65	0.30	0.033	0.0508
95 +	1	1	0.500	0	0.00	1.00	0.30	0.000	0.0000

Compared to elderly females, elderly males have less chances of getting the incidence of functional disability. Out of 111 functional disability cases, only 33 are males. Of the 196 male elderly in the age group 60-64, 10 people had the episode of functional disability. That is, 2 percent had the incidence of disability and the hazard rate is 0.0041. The hazard rate increases with age, those who have completed 90 years of life the hazard rate is 0.136. In the case of elderly females, out of 585 females, 78 had reported that they had the problem of functional disability (13 percent). Here, also the probability density function and the hazard rate are also increasing with age. The hazard rate for the age group 60-64 years is 0.0062 and for the 90-94 age group it is 0.100.

Table – 14
Results of Life Table Analysis - Male

Interval Start Time	Number Entering Interval	Number Withdrawing During Interval	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating	Proportion Surviving	Cumulative Proportion Surviving at End of Interval	Probability Density	Hazard Rate
60 - 64	546	186	453.000	10	0.02	0.98	0.98	0.004	0.0041
65 - 69	350	131	284.500	4	0.01	0.99	0.96	0.003	0.0031
70 - 74	215	103	163.500	4	0.02	0.98	0.94	0.005	0.0053
75 - 79	108	58	79.000	5	0.06	0.94	0.88	0.012	0.0136
80 - 84	45	26	32.000	5	0.16	0.84	0.74	0.028	0.0378
85 - 89	14	6	11.000	4	0.36	0.64	0.47	0.054	0.1149
90 - 94	4	3	2.500	1	0.40	0.60	0.28	0.038	0.1357

Table - 15
Results of Life Table Analysis - Female

Interval Start Time	Number Entering Interval	Number Withdrawing During Interval	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating	Proportion Surviving	Cumulative Proportion Surviving at End of Interval	Probability Density	Hazard Rate
60 - 64	585	166	502.000	14	0.03	0.097	0.97	0.006	0.0062
65 - 69	405	128	341.000	13	0.04	0.96	0.94	0.007	0.0075
70 - 74	264	114	207.000	18	0.09	0.91	0.85	0.016	0.0188
75 - 79	132	51	106.500	12	0.11	0.89	0.76	0.019	0.0250
80 - 84	69	21	58.500	12	0.21	0.79	0.60	0.031	0.0517
85 - 89	36	20	26.000	7	0.27	0.73	0.44	0.032	00727
90 - 94	9	6	6.000	2	0.33	0.67	0.29	0.029	0.1000
95 +	1	1	0.500	0	0.00	1.00	0.29	0.000	0.0000

Cox Proportional Hazard Model

In order to examine the influence of demographic and socio-economic variables on the incidence of occurring functional disability among elderly, Cox Proportional Hazard Model was used. The dependent variable taken in the study is the risk of having any form of disability among the respondents. The independent variables taken for the analysis are categorical dummy variable. Any value of exp (B) greater than one implied a higher chance of having the disability in that category as compared to the reference category. The results are discussing below.

The result of the Cox Regression (Table 16) reveals that those who have completed high school and higher secondary education have 27 percent higher chance of getting functional disability compared to the illiterate or completed primary level education. But those who have completed the graduation and above have 24 percent lesser chance of having functional disability compared to illiterate or completed primary level education. Occupation wise analysis reveals that pensioners' and those who are continuing work have lesser chance of getting disability of 32 and 25 percent respectively compared to non workers. If we take the case of religion Christian and Muslims have 32 percent higher chance of having disability compared to Hindus. Other important aspect such as income, present health condition, participation in household work, participation in social and religious matters, feeling of loneliness, those having bad habits, family interaction, impact of death happened in the family during last five years etc was also studied.

Those who have monthly income of 5000 and above have 50 percent lesser chance of getting disability compared to those who have monthly income less than Rs 1000. While considering the present health condition of the elderly, those who have good health condition have 60 percent lesser chance of having disability compared to those who reported to have very poor health condition. Those who are doing household activities and participating in social and religious matters have lesser chance of having disability compared to the other group. The elderly individuals those who have reported that they have the feelings of loneliness are more prone to disability (42 percent) than those who do not have that feeling. Those who have interaction with family members have 40 percent lesser chance of having disability compared to those who have interaction with their family members. If any death happened in the family during the last five years, then those elderly have 62 percent higher chance of having the risk

of disability. A detailed study of male and female was also done and the result is given in Table 17 and Table 18 respectively.

Table - 16
Results of Cox Regression Analysis (Total)

Variables	B	SE	Wald	Exp(B)
Marital status				
Single/Widow/Widower/Divorced®				
Currently Married	0.100	0.235	0.182	1.105
Educational status				
Illiterate/Primary/Middle level®			3.348	
High School	0.241	0.287	0.705	1.273*
Higher Secondary	0.990	0.61	2.3623	2.691*
Degree & above	-0.003	0.388	0.000	0.997
Occupational status				
Non-workers®			1.135	
Pensioners	-0.380	0.358	1.125	0.684*
Workers	-0.277	0.503	0.303	0.758*
Income				
≤ 1000/-®			5.023	
1001 – 3000/-	0.012	0.396	0.001	1.012
3001 – 5000/-	0.404	0.385	1.105	1.498*
≥5001	0.723	0.368	3.874	2.062**
Health condition				
Very Poor®			72.126	
Poor	-0.906	0.239	14.319	0.404**
Satisfactory/Good	-3.157	0.372	72.104	0.043**
Household work				
No®				
Yes	-0.414	0.279	2.212	0.661*
Social religious matter				
No®				
Yes	-0.114	0.250	0.210	0.892
Loneliness				
No®				
Yes	0.348	0.402	0.747	1.416*
Bad habit				
No®				
Yes	-0.981	0.353	7.702	0.375*
Family interaction				
No®				
Yes	-0.526	0.256	4.232	0.591*
Death in Family				
No®				
Yes	0.483	0.239	4.085	1.621*
Religion				
Hindu®			1.903	
Christian	0.316	0.243	1.695	1.375*
Muslim	0.311	0.535	0.339	1.365
Type of Family				
Nuclear Family®			0.996	
Joint family	0.201	0.231	0.759	1.223*
Single	0.296	0.468	0.399	1.344

® Reference Category
*** Significant at 5 percent level of significance, ** Significant at 1 percent level of significance**

Table - 17
Results of Cox Regression Analysis (Male)

Variables	B	SE	Wald	Exp(B)
Marital status				
Single/Widow/Widower/Divorced®				
Currently Married	-0.899	.632	2.062	0.407*
Educational status				
Illiterate/Primary/Middle level®			.264	
High School	0.064	.635	.010	1.066
Higher Secondary	-12.022	734.746	.000	0.000
Degree & above	-0.229	.739	.096	0.795
Occupational status				
Non-workers®			1.135	
Pensioners	0.896	.850	1.111	2.449*
Workers	0.416	.830	.251	1.516
Income				
≤ 1000/-®			2.829	
1001 – 3000/-	-0.735	.920	.638	0.480*
3001 – 5000/-	0.140	.750	.035	1.150*
≥5001	0.554	.726	.581	1.740**
Health condition				
Very Poor®			18.356	
Poor	-0.447	.506	.781	0.640
Satisfactory/Good	-3.812	.910	17.544	0.022
Household work				
No®				
Yes	0.513	.614	.700	1.671*
Social religious matter				
No®				
Yes	-0.543	.505	1.160	0.581
Loneliness				
No®				
Yes	-0.112	1.192	.009	0.894
Bad habit				
No®				
Yes	-1.007	.622	2.622	0.365*
Family interaction				
No®				
Yes	-1.101	.482	50227	0.332*
Death in Family				
No®				
Yes	0.320	.500	.408	1.377
Religion				
Hindu®			3.878	
Christian	-0.146	.502	.084	0.865
Muslim	1.619	.845	3.675	5.049*
Type of Family				
Nuclear Family®			.006	
Joint family	0.031	.407	.006	1.032
Single	-12.777	791.934	.000	0.000

® Reference Category

* Significant at 5 percent level of significance, ** Significant at 1 percent level of significance

Table - 18
Results of Cox Regression Analysis (Female)

Variables	B	SE	Wald	Exp(B)
Marital status				
Single/Widow/Widower/Divorced®				
Currently Married	.897	.344	6.783	2.452*
Educational status				
Illiterate/Primary/Middle level®			2.749	
High School	.056	.355	.025	1.057
Higher Secondary	.998	.628	2.526	2.712*
Degree & above	-.138	.527	.069	0.871
Occupational status				
Non-workers®			2.202	
Pensioners	-.579	.490	1.397	0.561*
Workers	-1.221	.961	1.614	0.295*
Income				
≤ 1000/-®			3.822	
1001 – 3000/-	.520	.513	1.029	1.682*
3001 – 5000/-	.636	.484	1.723	1.888*
≥5001	.858	.455	3.553	2.358*
Health condition				
Very Poor®			42.928	
Poor	-1.015	.291	12.161	0.362**
Satisfactory/Good	-2.888	.442	42.699	0.056**
Household work				
No®				
Yes	-.599	.328	3.330	0.549*
Social religious matter				
No®				
Yes	-.072	.316	.053	0.930
Loneliness				
No®				
Yes	.455	.475	.917	1.575*
Bad habit				
No®				
Yes	-.954	.470	4.112	0.385*
Family interaction				
No®				
Yes	-.262	.328	.637	0.770*
Death in Family				
No®				
Yes	.746	.302	6.102	2.108**
Religion				
Hindu®			3.472	
Christian	.559	.299	3.409	1.738
Muslim	-.096	.738	.017	0.909*
Type of Family				
Nuclear Family®			1.865	
Joint family	.345	.310	1.237	1.411*
Single	.542	.546	.985	1.719*

® Reference Category
* Significant at 5 percent level of significance, ** Significant at 1 percent level of significance

Usually we expect that the currently married aged people have low risk of getting disability compared to other marital status group, but here, it is noted that, in the case of currently married women (Table-18) have more than double chances of getting disability than single/divorced/separated women, while males (Table -17) the currently married males have less risk of having disability. In the case of education, medium level educated females have higher chances of getting disability compared to illiterate or low level educated elderly but for males the trend is on the reverse direction. But in the case of elderly, those with higher education (Degree and above) for both sex have comparatively lesser chances of getting the incidence of disability. The elderly females those who are working have low risk of getting disability than non-working females and for males the picture is in the opposite direction.

The result of the Cox regression analysis reveals that the disability chances increases with income level for both the males and females. In the case of females, the situation is more severe compared to their counterparts. Further, for both sexes, those who reported their perceived health status as satisfactory or good have very low chances of having disability than those who reported very poor as their health condition. The older males those who are engaged in the household activities have higher risk of getting disability compared to those who are engaging in house hold work, but among females those who are actively participating house hold work have lower chances getting the disability. Similarly the aged people engaged in social and religious matters; here both men and women have the lesser chances of having the risk of disability. But for males the probability of getting disability are comparatively low (42 percent lesser chance). Again it is interested to note that aged males and females having bad habits have very low risk of having disability. It needs further enquiry. Further senior males of the family those who have interaction with other members of the family have very less chance (69 percent) of getting the episode of any disability compared to their counterpart (33 percent). Again, both the males and females with an experience of any recent death (close relative) in the family have higher chances of disability than those who do not have that experience.

The analysis reveals that among males, elderly Christian have fewer chances of getting disability than Hindus while Muslims have very high risk (four times) of disability than elderly Hindus. But among females, Christian have higher chances (74 percent) and Muslims have less chances (10 percent) compared to Hindus. Finally, it can be seen that, the senior people those who are living in joint or single families have the high risk of getting disability than their friends those who are living in nuclear family. This is true for females but for males the risk is more or less same for joint families but, it is insignificant for single family dwellers it may be due smaller sample size.

Conclusion

The main objective of the study is to examine the prevalence of chronic ailment of a sample of aged people during in different demographic and socio-economic groups. Primary data were collected for the study and the main tool used for data collection was interview method. 1131 elderly persons were interviewed. In addition to the univariate and bivariate analysis sophisticated methods like life table techniques and Cox proportional hazard model were also used for the analysis.

The overall sex ratio is 1071, which is less than the State ratio of 1229. Among old-old the sex ratio is very high which is higher than the State ratio. In the sample about 65 percent are currently married, among the males 89 percent are currently married but in the case of

females it is only 43 percent. Further 30 percent of the respondent have above high school level of education, in the case of males about 39 percent have above high school level of education while females it was only 21 percent.

The loneliness was an important problem of the aged which affect the well being of the aged. The loneliness was more among elderly women than men. In this study about 35 percent of the respondents reported their health status was very poor or poor. The perception about poor health was more among females than males, while the perception about good health was more among males. Nearly 10 percent of the respondents had severe functional disability, and again more women had disability than men. All these individuals required help or assistance for their daily routine.

The life table analysis revealed that the probability density function and the hazard rate were increasing with age. That is, the chance of getting the incidence of functional disability increasing with age. It was also noted that, the median years of life to those who had completed 60 years of age without getting any functional disability is 29 years.

The Cox regression analysis clearly revealed that older people who have any work or pension (previously employed), having better health condition, those who have interaction with family members and those who engaged in the house hold and social and religious matters have comparatively lesser chances of getting any type of disability. There is a strong association between physical health, mental health and social roles. This study clearly showed this relationship.

Again those who had the feeling of loneliness had the experience any death in the family and living in joint and single families had the higher chances of getting disability. Further the risk having disability increases with education and income. It may be due to better awareness and higher spending (as having money). The elderly person particularly elderly women who rarely feel loneliness and had no death in the family in the recent past have fewer worries and tensions and are often happy with their life.

Even when one is not suffering from any diseases, one experiences a gradual decline in physical strength with the growing age. Healthy ageing requires life style that will avoid habits causing health hazards and shortening life span. Old age is usually considered as a period of illness and need for prolonged expense and expertise treatment. So their health care becomes a serious problem to their family. The feeling of the elderly that they should be taken care of by family is important for better quality of life. Hence healthy ageing and health promoting behaviours are absolutely essential.

The growing number of older people who expect health care should not be viewed as a threat or a crisis. It is an opportunity, rather, to develop policies that will ensure decent living standards for all members of society, young and old, in the future. Countries need to develop strategic frameworks for the coordination of health, social and economic reforms as well as to raise the level of public understanding of the policy choices to be made. It is the need to examine and make appropriate changes to health, social and economic policies, not the ageing of population, which is the biggest challenge facing society today.

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