SES and Health Expectancies in the Mexican Elderly Population

Cesar Gonzalez-Gonzalez, Instituto Nacional de Geriatria, Mexico.
Roberto Ham-Chande, EL Colegio de la Frontera Norte.

Introduction

In Mexico life expectancy at birth (LE) has doubled in the past 80 years. In the 1930s, LE was about 34 years and has increase to 75 by 2010. The rapid declines in mortality and fertility yield a demographic momentum with aging as its main demographic consequence, also correlated to increases of incidence and prevalence of chronic diseases and disabilities.

Limited studies rely on diverse research assumptions linking aging, life expectancies and health outcomes. Three possible paths have been suggested: a) Higher life expectancies mean better health conditions. b) Living longer just imply more time in disease and disability. c) It may be that life and health keep the same time proportion in a dynamic equilibrium. In this paper we are considering people born before 1950, whose life course has been documented to include unfavorable events. Certain social, economic and health conditions in Mexico during the first 40 years of the twentieth had dreadful consequences, like the flu epidemics of 1918, the Mexican Revolution and its aftermaths of political and social unrest. LE in 1940 was about 42 years. Since then social, economic and public health conditions have steadily improved and now LE is 75. However, circumstances experienced during childhood and adolescence of today´s elderly have impact on their health and quality of life. Ruiz (2004) found that health status at older ages is significantly associated with health and social conditions experienced in childhood. Such findings should be considered when estimating healthy life expectancy (HLE). HLE is defined as the average number of years that an individual can expect to live in a satisfactory state of health and activity.

It must be highlighted that relations between SES and health are not always the same. They are different depending on the socio-economic conditions and degree of development of each country. They are never static but evolving according to economic changes, social values, political situations and organization of health systems (Phillips, 2005;) (Marmot, 2006).

In terms of health and in line with demographic aging, the epidemiological profile has changed substantially mainly because chronic non-communicable diseases are increasingly impacting mortality and morbidity. In fact and due to the aging of the population those conditions are the biggest challenge for the health system (Córdoba Villalobos et al., 2008). The rapid increase of these diseases has been significant. The prevalence of high blood pressure was 30.8% in 2006. For the population 60 years and over the figure magnify, to be 50% in men and 60% in women (Olaiz - Fernandez G 2006).

Chronic non-communicable diseases already are the leading causes of death. But that is less important than their non-lethal effects. In the case of type 2 diabetes, it is one of the main causes of premature disability, blindness, terminal kidney failure, and non-traumatic amputations (Córdoba Villalobos et al. 2008). It has also been reported as one of the most frequent causes of hospitalization in adults in the country (Secretaría de Salud, 2002).

For the loss of functionality, the Census of Population and Housing of 2010 shows that 26% of the population 65 and over have limitations either physical, cognitive, or sensory. The lack of compressive health, social and economic support for the elderly, highlights the importance of having detailed information about health and functionality differentials according to demographic indicators and SES. Thus, the main objective of this study is to identify and evaluate SES indicators linked to education, income, and social conditions and health in childhood affecting life expectancies, chronic diseases, and disabilities.

Methods and data

This paper uses data from the "Mexican Health and Aging Study" (MHAS), 2001. The study provide statistical information of the population 50 years and older, with national and urban-rural representation, allowing the evaluation of the aging process considering backgrounds and interrelations on demographics, chronic diseases, mental conditions, disabilities, economics, labor, migration, social, and family. In 2001, the sample size was estimated at 16,071 persons and 11,000 households. A total of 12,513 records were used and represents 13.5 million of persons 50 and over.

Chronic diseases. Seven self-reported chronic diseases were used: hypertension, diabetes, cancer, lung disease, heart attack, stroke and arthritis, a new variable was creates with code 1 if the person reports at least one disease and code 0 without diseases.

Physical limitations. Self-reported difficulties to perform Activities of the Daily Living (ADL) were used, which include: walking across a room, bathing or showering, eating, getting into or out of bed and using the toilet. A dichotomous variable is generated with code 1 if the respondent has difficulty with at least one activity and 0 otherwise.

Socioeconomic Status (SES). Four indicators were created, education (with and without education), income (up to one minimum wage versus above one minimum wage), the presence of toilet inside the childhood dwelling unit, and if a serious health problem occurred in childhood.

Age, sex and locality size were include to control effects in multivariate models.

Analyses

Two logistic regression models were carried out. One for chronic diseases and another for ADL difficulties. From the results from both models, conditional probabilities were calculated and used as proportions. To estimate the HLE, we use specific death rates (obtained from vital records) and the prevalence of chronic conditions and difficulty with ADL´s (obtained with MHAS). The healthy life expectancy is calculated using an adaptation of the traditional life table.

Results

The results show that the population aged 50 and over, 53.2% women, 45.1% live in urban localities (100,000 inhabitants or more) and on average they have 3.9 years of schooling. Of the individuals included in the sample, 56.4% reported at least one self-reported chronic diseases and 10.7% have difficulty with ADL´s. As for individual characteristics in childhood, 71.6% reported that there had bathroom or toilet in their home before age being 10 years old. 10.0% had a serious health problem in childhood and 55.7% report less than a minimum wage as their present total income.

The odd ratios (OR) resulting from the regression model for chronic diseases show a significant positive association with serious health problems in childhood (OR = 1.44, 95% CI = 1.3, 1.6), incomplete basic education (OR = 1.14, 95% CI = 1.0, 1.3), sex (OR = 0.49, 95% CI = 0.45, 0.53), age (OR = 1.02, 95% CI = 1.02, 1.03), and locality size (OR = 1.19, 95% CI = 1.08, 1.29). In the ADL model all independent variables have significant effect, especially headache in childhood (OR = 1.71, 95% CI = 1.31, 2.22) and complete basic education (OR = 0.68, 95% CI = 0.57, 0.80).

Tables 2a to 2d displayed a numerical summary of healthy life expectancies by the Sullivan method for each indicator of socioeconomic status (SES) and health during childhood. It shows total LE, LE with and without CD, % of LE with CD. The same concepts are repeated for ADL limitations.

From these tables three patterns emerge: 1) The proportion of LE with CD is higher than with ADL limitations; (2) while the percentage of LE with CD decreases with age, the percentage of LE with disabilities increases; (3) it seems that SES, rather than a childhood serious health problems, has greater impact health life expectancy as it is show in graphs 1a and 1b.

Preliminary Conclusions

The study of the health and wellbeing of the elderly requires a comprehensive analysis that includes various factors that determine these conditions. In addition to the biomedical characteristics, it must be recognized that the conditions under which people live during the lifetime determine, shape and define the state of health in old age and the aging process

(Link and Phelan, 2002; Smith, 2004). To understand these determinants and how they interact with each other, it is necessary to identify specific factors to which members of different socioeconomic levels have been exposed and how they experience different results in the health-disease process, and to become the starting point for the planning and implementation of public health policies on aging.

This paper tries to elucidate the effects of different socioeconomic status indicators on two health outcomes for the elderly population. And also we calculate the number of years that an individual will live with illness or disability depending of his socioeconomic characteristics.

Regression Models

Table 1. Logistic regression models for chronic diseases and ADL limitations

Covariables for chronic diseases	RM	Error estándar	z	P>(z)	95% IC	
With toilet inside the house	1.083	0.0497	1.73	0.084	0.9894	1.1845
Serious health problem in childhood	1.445	0.0954	5.57	0.000	1.2691	1.6441
Headache in childhood	1.250	0.1319	2.11	0.035	1.0161	1.5369
Incomplete basic school	1.146	0.0596	2.61	0.009	1.0346	1.2687
Complete basic school	0.943	0.0537	-1.03	0.304	0.8436	1.0545
Age	1.026	0.0023	11.67	0.000	1.0217	1.0305
Sex (Men)	0.487	0.0190	18.42	0.000	0.4509	0.5255
Locality size (more urban)	1.186	0.0520	3.89	0.000	1.0882	1.2925
Monthly income (+1 minimum wage)	1.019	0.0409	0.48	0.634	0.9422	1.1026
Constant	0.308	0.0484	-7.50	0.000	0.2269	0.4194

Covariables for ADL limitations	RM	Error estándar	z	P>(z)	95% IC	
With toilet inside the house	1.247	0.0950	2.89	0.004	1.0736	1.4476
Serious health problem in childhood	1.303	0.1193	2.89	0.004	1.0887	1.5589
Headache in childhood	1.712	0.2297	4.00	0.000	1.3157	2.2267
Incomplete basic school	0.675	0.0721	0.00	0.999	0.8681	1.1518
Complete basic school	1.059	0.0600	-4.42	0.000	0.5674	0.8037
Age	1.059	0.0032	18.94	0.000	1.0526	1.0652
Sex (Men)	0.712	0.0442	-5.47	0.000	0.6307	0.8043
Locality size (more urban)	1.238	0.0830	3.19	0.001	1.0861	1.4123
Monthly income (+1 minimum wage)	0.842	0.0538	-2.69	0.007	0.7430	0.9544
Constant	0.003	0.0007	25.06	0.000	0.0019	0.0048

Tables 2a a 2d. LE by SES, prevalence of CD and ADL limitations

2a. Without toilet in the dwelling unit before age 10

Age	Life expectancy	LE		% LE with CD	LE		% of LE with ADL limitation
		With CD	Without CD		With ADL	Without ADL	
50	29.23	11.50	17.73	39.35	3.70	25.53	12.66
55	25.10	9.45	15.65	37.64	3.56	21.55	14.17
60	21.22	7.62	13.60	35.92	3.39	17.83	15.96
65	17.61	6.02	11.59	34.19	3.18	14.43	18.07
70	14.35	4.66	9.69	32.48	2.94	11.40	20.52
75	11.46	3.53	7.93	30.80	2.67	8.79	23.31
80	8.97	2.63	6.35	29.25	2.36	6.61	26.30
85 +	6.92	1.94	4.98	28.07	2.00	4.92	28.89

2b. With serious health problem before age 10

Age	Life expectancy	LE		% LE with CD	LE		% of LE with ADL limitation
		With CD	Without CD		With ADL	Without ADL	
50	29.23	9.43	19.80	32.25	4.27	24.96	14.62
55	25.10	7.70	17.41	30.67	4.10	21.00	16.34
60	21.22	6.17	15.04	29.09	3.90	17.32	18.36
65	17.61	4.85	12.76	27.54	3.65	13.96	20.73
70	14.35	3.73	10.62	26.01	3.37	10.98	23.47
75	11.46	2.81	8.65	24.54	3.04	8.42	26.55
80	8.97	2.08	6.89	23.19	2.68	6.30	29.82
85 +	6.92	1.53	5.39	22.17	2.26	4.67	32.62

2c. Without schooling

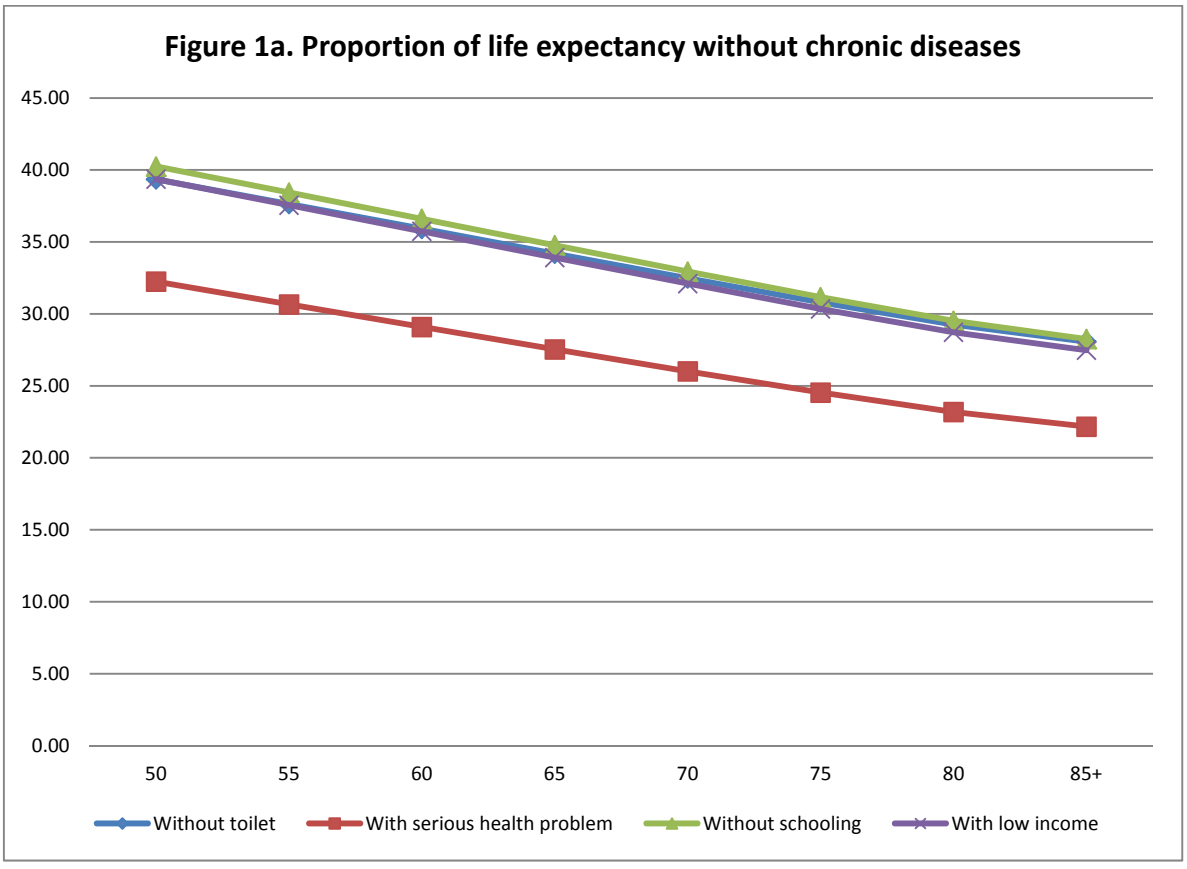
Age	Life expectancy	LE		% of LE with CD	LE		% of LE with ADL limitation
		With CD	Without CD		With ADL	Without ADL	
50	29.23	11.76	17.47	40.25	4.09	25.14	13.98
55	25.10	9.65	15.46	38.43	3.93	21.17	15.65
60	21.22	7.77	13.45	36.60	3.74	17.48	17.62
65	17.61	6.12	11.49	34.77	3.51	14.10	19.93
70	14.35	4.73	9.62	32.94	3.24	11.10	22.61
75	11.46	3.57	7.89	31.16	2.94	8.52	25.65
80	8.97	2.65	6.33	29.52	2.59	6.38	28.88
85 +	6.92	1.96	4.97	28.26	2.19	4.73	31.67

2d. With low income

Age	Life expectancy	LE		% of LE with CD	LE		% of LE with ADL limitation
		With CD	Without CD		With ADL	Without ADL	
50	29.23	11.51	17.72	39.36	3.25	25.98	11.12
55	25.10	9.43	15.68	37.56	3.13	21.97	12.47
60	21.22	7.58	13.63	35.74	2.98	18.23	14.06
65	17.61	5.97	11.64	33.92	2.81	14.81	15.94
70	14.35	4.61	9.74	32.11	2.60	11.74	18.15
75	11.46	3.48	7.98	30.35	2.37	9.09	20.68
80	8.97	2.58	6.40	28.72	2.10	6.87	23.41
85 +	6.92	1.90	5.02	27.48	1.79	5.14	25.81

CD = Chronic diseases; AD = ADL limitation

Gráfica 1a y 1b. Proportion of LE without CD and without ADL limitations bu SES



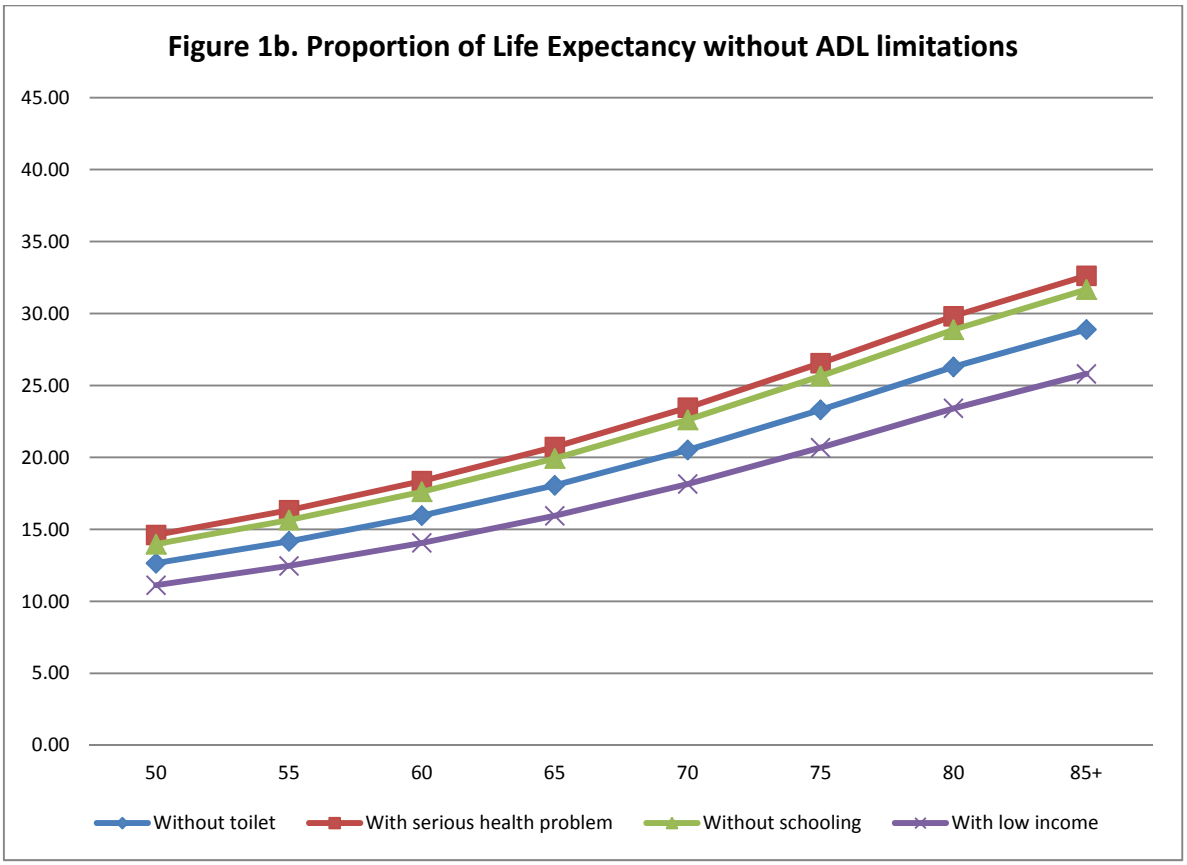


Figure 1b. Proportion of Life Expectancy without ADL limitations
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
50
55
60
65
70
75
80
85+
Without toilet
With serious health problem
Without schooling
With low income