

Life expectancy at birth for the rural population of Islamic Republic of Iran, by sex and age groups, 2007.

Hamid Reza Ghafarian shirazi^{1,2}, Mahmoud Mahmoudi,² Kazem Mohamad,² Abas Rahimi Froshani,² Nahid Jafari,³ Rahim Ostovar,¹ Mohammad Salehi,² Mansore Mirzaee,² Abdollah Hajivandi,⁴ and Mohamad Ali Mansorian¹.

¹Social Determinants of Health Research Centre, Yasuj University of Medical Sciences, Yasuj, I.R. Iran.

²School of Public Health, Tehran University of Medical Sciences, Tehran, I.R. Iran.

³Centre for Health Network Development, Ministry of Health and Medical Education, Tehran, I.R. Iran.

⁴School of Public Health, Bushehr University of Medical Sciences, Bushehr, I.R. Iran.

Gshr3@yahoo.com

ABSTRACT: Life expectancy at birth is one of the most important indices of the social, economical, cultural and health status of a country. The aim of this study was to draw up life tables for the rural population of the Islamic Republic of Iran in 2007 and estimate the life expectancy for males and females. A total of 60 561 deaths among 11 463 702 males and 44 055 deaths among 10 999 627 females were studied. Life expectancy at birth was estimated by the direct and indirect methods. The results were consistent using both methods. Life expectancies at birth for men and women in the rural population in 2007 were 72.2 and 73.9 years respectively and the total was 73.0 years. The percentage of women aged over 65 years was 5.9% and of men was 6.4%. The trend of life expectancy for men and women over the past 30 years showed a 31.0% increase for men and 31.3% for women. [Ghaffarian Shirazi H.R, Mahmoudi M, Mohamad K, Rahimi Froshani A, Jafari N, Ostevar R, Salehi M, Mirzaee M, Hajivandi A, Mansorian M. **Life expectancy at birth for the rural population of Islamic Republic of Iran by sex and age groups, 2007.** *Life Sci J* 2012;9(3):1180-1183]. (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 165

Keywords: Life Expectancy, Birth, Rural, Iran, 2007.

Introduction:

Life expectancy at birth indicates the estimated average years that a newborn will live provided that the possibility of death will be similar to that for present human beings in future years. It is an important index which indicates the cultural, social, economical and health status of any society and is useful for public health policy-making. The World Health Organization (WHO) used this index and other indices, such as *per capita* income, gross national product and the rate of female literacy, to estimate the human development index, which is one of the most important evaluation indices of countries today.

According to a WHO report in 1997, the lowest life expectancy at birth (41 years) was in Guinea Bissau and the highest (80 years) was in Japan. In the same year the Islamic Republic of Iran ranked 80th, among 192 countries [1]. Life expectancy can be calculated for any age; for example, it can be determined how many more years a 45-year-old man will live provided that the possibility pattern of his death in the future will be similar to that for the current population at any age group [2]. In countries with a high infant mortality rate, life expectancy at birth is greatly affected by the rate of deaths in the first year of life. Therefore life expectancy excluding deaths of children under 1 year old may be a better indicator.

Life expectancy has been estimated a number of times in the Islamic Republic of Iran, using different

data and calculation methods, for the whole country and its provinces [1–10]. The aim of this study was to draw up life tables for the rural population of the Islamic Republic of Iran in 2007 and estimate the life expectancy at birth for men and women. Comparing life expectancy in a country with that of neighbouring countries can reveal a country's overall health outlook compared with other regions [7,8]. Our data were therefore compared with data for other countries in and around the Eastern Mediterranean region.

Material and Methods:

A total of 60 561 deaths among 11 463 702 males and 44 055 deaths among 10 999 627 females from the rural population of Islamic Republic of Iran during the year 2007 were studied. This information was extracted from the life event registration form which is compiled annually in each village and city health centre. The forms are collected and monitored at each stage and then sent to the provincial centres and then to the country development network.

The data were used to calculate the life expectancy by age group and sex. Calculation was done using both the direct [9,10] and indirect methods and data from the 2 methods were compared. Calculating the life table by the direct method was done using the population size and the number of deaths at each age or age group during the year. We also calculated the 1-year-old life expectancy by the indirect method using the population size and number of deaths for male and female children less than 1 year old in a year. This was done using MortPak, the

United Nations software package for mortality measurement [11].

Some limitations of the data were correct as follows. Information belonging to certain cities which had certain and unacceptable errors was excluded with the assumption that deleted information was similar to the rest of the information. Also due to technical and software problems information about men aged over 85 years was not available. Therefore, a significant linear relationship between the male population in 2006 and male population in 2007 with a correlation coefficient of 0.997 and determination coefficient of 0.994 was used for calculations. Based on similar studies, life expectancy at age group of over 85 years of age was considered as 1.1 for women and 1.0 for men [10].

Results:

The life tables are shown in Table 1. Life expectancy at birth in the rural population of Islamic Republic of Iran was 72.2 years and 73.9 years respectively for men and women and 72.7 years overall for the whole population. The data also showed that the percentage aged over 65 years of age was 5.9% for women and was 6.4% for men.

Figure 1 shows the trend of life expectancy for men and women in the past 30 years in the rural population of Islamic Republic of Iran. The increasing trend of life expectancy was greater in the first decade, while at the third decade, between the years 1997 and 2007, the trend decelerated. The increase in life expectancy was 31.0% for men and 31.3% for women over the 30-year period. Women had greater life expectancies than men at all decades of data collection and the difference in life expectancy between the sexes was 1.2 years in 1975, 3.0 years in 1987, 2.7 years in 1997 and 1.7 years in 2007 respectively. The results of the 2 methods were consistent. (table 3)

In direct method we use population and death in all groups for calculating life expectancy, but in indirect method we use only: the number of deaths and population of less than 1 year old children, that are more precise than similar data for all age groups of a population, with using *Mortpak* software.

Discussion:

Based on previous studies, the life expectancy at birth in the rural population of Islamic Republic of Iran in 1975 was estimated as 55.1 years for men and 56.3 years for women [3]. In 1987 it was 66 and 69 years respectively [1,4] and in 1997 it was 70.7 and 73.4 years respectively [5]. According to present study results, these values were 73.9 and 72.2 years in 2007 for males and females respectively. Considering the similarity of resources and equal calculation method in the 4 recent studies and a 10-

year interval between the studies, the life expectancy at birth had an increasing trend in the past 3 decades (Figure 1).

The high rate of increase in life expectancy in the first decade of data recording, between 1976/77 and 1987/87, decelerated in the third decade, between 1996/97 and 2006/007. This is natural because Life expectancy has increased much faster trend has reached to its normal limit. Then the trend of increasing will reduced, although, some other factors will affect in this trend like war between Iraq and Iran in years 1970 to 1988 and after finishing war. And also because the higher life expectancy which belongs to the more developed countries will be accessible in more times [12,13]. This trend is for a rural population, and the same data for urban areas also needs to be studied. Comparing the results of this study with the past estimates of the region and the latest country estimate showed an increase in life expectancy in Islamic Republic of Iran. Lower life expectancy in rural areas compared with similar studies nationwide and in urban areas in the past 5 to 7 years [2,6–8,14,15] indicates a need for more attention to health in rural areas of our country.

The difference in life expectancy between men and women in advanced countries is about 5 to 8 years, while in less developed countries this difference is close to zero. In rural areas of Islamic Republic of Iran the difference in life expectancy between the sexes was 1.2, 3.0, 2.7 and 1.7 years for the years 1975, 1987, 1997 and 2007 respectively, which it indicates no significant change in life indices related to rural women in recent years. We could not compare the life expectancy of our study directly with that in neighbouring countries due to different calculation methods of life expectancy. Instead we used the WHO reports which compared life expectancy in 2007/2008 and healthy life expectancy at birth in 2003 for males and females [16]. These are shown in Table 2 for the Islamic Republic of Iran and neighbouring countries. Life expectancy at birth in our study was 72.2 and 73.9 years for males and females, and 73.0 in total population versus 70.75 years in the WHO report in total. (Table 2)

Life expectancy and healthy life expectancy in the Islamic Republic of Iran was higher than in Afghanistan, Iraq, Pakistan and Saudi Arabia but lower than in Qatar, Kuwait and Turkey.

Because the number of deaths and population of less than 1 year old children in each year were enough to calculate life tables and life expectancy by the indirect method and using *Mortpak* software, and because these data are more precise than similar data for all age groups of a population, this method is preferably suggested for developing countries.

Acknowledgement

Department of Epidemiology and Biostatistics,
School of Public Health, Tehran University of
Medical Sciences, Tehran, I.R.Iran.

E-mail: gshr3@yahoo.com

Table 1 Population, deaths and life expectancy at birth by age groups and by sex in the rural population of the Islamic Republic of Iran, 2007

Age (years)	Females Population (no.)	Deaths (no.)	Life expectancy (years)	Males Population (no.)	Deaths (no.)	Life expectancy (years)	Total Population (no.)	Deaths (no.)	Life expectancy (years)
0	197 240	3474	73.9	206 626	4 156	72.2	403 866	7630	73.0
1-4	714 685	690	74.3	747 197	835	72.6	1 461 882	1 525	74.0
5-9	916 408	325	70.5	960 774	497	68.8	1 877 182	822	69.6
10-14	1 237 940	343	65.6	1 301 459	628	63.9	2 539 399	971	64.6
15-19	1 504 517	813	60.7	1 697 020	2 118	59.0	3 201 537	2 931	59.8
20-24	1 329 519	791	55.9	1 462 256	2 615	54.2	2 791 775	3 406	55.2
25-29	1 039 141	689	51.1	1 118 745	2 045	49.4	2 157 886	2 734	50.6
30-34	810 595	552	46.3	834 823	1 441	44.6	1 645 418	1 993	45.1
35-39	652 630	639	41.5	633 636	1 401	39.8	1 286 266	2 040	40.4
40-44	524 122	704	36.7	521 062	1 501	35.1	1 045 184	2 205	31.8
45-49	472 781	1 040	32.1	448 187	1 949	30.4	920 968	2 989	31.6
50-54	408 930	1 434	27.6	355 189	2 193	25.9	764 119	3 627	26.6
55-59	303 832	1 820	23.3	249 923	2 348	21.7	553 755	4 168	22.6
60-64	242 041	2 425	19.1	215 641	2 888	17.8	457 682	5 313	18.2
65-69	222 317	3 791	15.2	232 819	4 377	14.2	455 136	8 168	14.9
70-74	193 044	5 950	11.8	226 542	7 513	11.0	419 586	13 463	11.4
75-79	129 638	7 019	8.8	156 273	8 249	8.4	285 911	15268	8.9
80-84	72 489	6 761	6.4	87 265	7 969	6.3	159 754	14 730	6.3
85+	27 758	4 795	1.2	33 416	5 838	1.0	36023	10 633	1.1

Table 2 Life expectancy, healthy life expectancy at birth and population growth rate in the Islamic Republic of Iran and neighbouring countries

Variable [reference]	Islamic Republic of Iran	Qatar	Pakistan	Afghanistan	Iraq	Saudi Arabia	Turkey	Kuwait
Life expectancy, males/females (years) 2008 [17]	70/75	76/76	63/64	40/44	58/69	69/75	72/77	78/79
Healthy life expectancy at birth, males/females (years) 2003 [18]	56/59	67/64	54/52	35/36	49/51	60/63	61/63	67/67
Population growth rate (%) 2008 [19]	1.6	5.2	1.8	2.0	3.0	2.3	1.5	9.3
Population growth rate (%) 2008 [19]	0.66		1.83	2.36	2.62	2.06	1.04	3.56

Table 3 life expectancy at birth by sex in the rural population of the Islamic Republic of Iran, 2007

Method	Females	Males	Total
Direct Method	73.9	72.2	73
Indirect Method	73.5	71.7	72.8

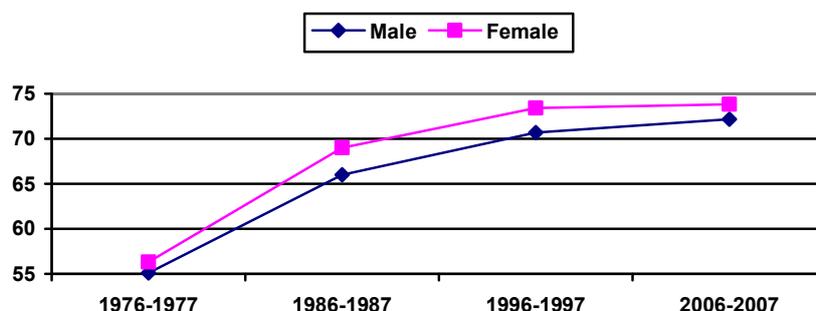


Figure 1 Comparison of life expectancy at birth between males and females over a 30-year period in the rural population of the Islamic Republic of Iran

This study was conducted with the material and moral supports of Social Determinants of Health Research Centre, Yasuj University of Medical Science and Centre for Health Network Development, Ministry of Health and Medical Education.

Corresponding Author:

Mahmoud Mahmoudi,

References

1. Malek Afzali H, Abadi MM. Life table of Iranian men and women in urban communities in 1984 (1363). *Journal of Environmental Biology*, 1986, 13:23–29 [in Farsi].
2. Ghaffarian Shirazi H, Mosavi A, Life expectancy for men and women in rural Kohgilouyeh and Boyer Ahmad in 2004. *Armaghaneh Danesh Journal*, 2004, 10(38):79–86 [in Farsi].
3. Nehapetian V, Khazaneh H. *Vital indices in Iran: mortality, fertility, growth population and life tables, 1973*. Tehran: Tehran University School of Public Health; 1974. [in Farsi].
4. Malek Afzali H, Pilehrudy S, Rezai P. Life expectancy of rural men and women of Iran. *Daro VA Darman*, 1986; 3(33):30–36 [in Farsi].
- 5- Malek Afzali H, Life expectancy of Iranian men and women in 1997(1375), *Hakim Research Journal*, 1999 1(2):107–110 [in Farsi].
5. Pourmalek Fet al. direct estimation of life expectancy in the Islamic Republic of Iran in 2003. *Eastern Mediterranean Health Journal*, 2009, 15(1):85-92.
6. Hajian K, Evaluation of ecological situation in the world life expectancy and its relationship with per capita gross national production. *Teb Va Tazkieh*, 2000;9(37):15–20 [in Farsi].
7. Ahmadi B et al. Higher life expectancy and lower Iranian women aged population: analysis around non-match. *Journal of School Health and Public Health Research Institute*, 2006, 4(2):1–5 [in Farsi].
8. Development of indicators for monitoring progress towards Health for All by the Year 2000. Geneva, World Health Organization, 1981.
9. Coal AJ, Demeny P. Regional model life tables and stable populations. Princeton, New Jersey, Princeton University Press, 1996:18–24.
10. MortPak for Windows. The United Nations software package for demographic measurement. New York, United Nations Population Division, 2003 (<http://www.un.org/esa/population/publications/mortpak/MORTPAKwebpage.pdf>, accessed 12 February 2012).
11. Murray CJL, Evanse DB. Health systems performance assessment: debates, methods and empiricism, 1st ed. Geneva, World Health Organisation, 2003.
12. World population prospects: the 2006 revision. Highlights. New York, United Nations, 2007.
13. Fallahzadeh H, Hadian A, comparison of life expectancy for men and women in Yazd province in the years 1375 and 1382, *Journal of Shahid Sadoughi University of Medical Sciences*, 2001 14(4):55–58 [in Farsi].
14. Drafshi H, Ghazizadeh A, Rahimi A. analytical study and predict population status of Kurdistan province in the next 50 years every 5 years away—1998. *Journal of Kurdistan University of Medical Sciences*, 2001, 4(13):9-1 [in Farsi].
15. http://apps.who.int/whosis/database/core/core_select_process.cfm.
16. http://www.who.int/healthinfo/statistics/mortality_life_tables/en/.
17. The world health report 2004: changing history. Geneva, World Health Organization, 2004.
18. http://www.photius.com/rankings/population/population_growth_rate_2008_1.html.

7/2/2012