Original Article

Epidemiology of the Mortality, Calculation of Life Expectancy and Years of Lost Life: The Case of Bane, North West of Iran

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Abstract

Background and purpose: Mortality Statistics and rates show the development of a country in the world. These statistics are very important for determining the distribution of risk factors of mortality (in age and gender groups, ethnicity and so on); and they are useful for improving health and preventing from important diseases in future planning of countries in societies.

Materials and Methods: This article is a longitudinal descriptive study. All registered deaths in Bane which occurred during 2006-2010, regardless of the cause, were collected from the department of health in Kurdistan University of Medical Sciences, and they were assigned into 21 categories based on Disease Category (ICD10) of WHO. Then the life table for every year was prepared and Life expectancy was computed for each age and sex and total lost years of life for all chapters of ICD10 were calculated.

Results: Based on the ICD10, four chapters with the highest frequencies include circulatory diseases by 1008 cases (32.5%), external causes of death by 522 cases (16.7%), cancers by 480 cases (15.3%), and prenatal death by 382 cases (12.2%). Overall, these chapters include 76.4% of total death. The most years of lost life were reported for prenatal period, external causes, diseases of the circulatory system and cancers.

Conclusion: Cardiovascular diseases, incidents and accidents, and cancers are the most important causes of death. Among the main reasons of death in the first group are high blood pressures, lack of movement, smoking, not consuming enough fruits, vegetables. In the second group the reasons include not obeying the traffic rules, high speed and so on. Since the sum years of lost life were the highest in the prenatal period, it is necessary to improve pregnancy care and teach mothers prior to pregnancy.

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1. Introduction

Death can be considered the ultimate fate of every man which is the climax of a disease. Mortality data can provide a general picture of the disease experience in society, especially when the intensity of the disease is high and the interval between the bout of the disease and the death is short(1). One of the important concomitants of the economic and social developments in the recent century has been the promotion of health and consequently the decline of mortality rate over the past century. One of the best strategies for increasing human longevity is to identify the patterns and causing agents of mortality in the population, and to deal with it. In all countries, this information is the basis for planning, management, and evaluation of the health sector and it shows how people in the community are provided with health services in all countries. It also specifies the distribution of risk factors of mortality among different age, gender, ethnicity, etc groups (2). According to a report published by the Asian and Pacific Population Studies and Research Center (PSRC), the global trend of mortality shows that mortality rates have declined worldwide in the past two centuries, but the starting point and the continuation of the intensity of this decrease have varied in different places (11). As the World Health Organization (WHO) reports, there has been a dramatic increase in non communicable diseases, especially in cancer and hypertension in developing countries. "Out of every five people who die today from these diseases, four come from countries with low or moderate income" says Dr Taiz Burma, a WHO official. He also maintains that the reason for this is the prevalence of risk factors such as hypertension, obesity, tobacco use and unhealthy diet which are very common in the world nowadays. According to the World Health Organization statistics, less than 20 percent of the people who live in Canada and America suffer from these diseases, while in some African countries, this figure stands at 50 percent. This study aimed at ranking the most important causes of mortality in Bane, a city located in North West of Iran. Given the importance of systematic registration of deaths and causes of death in the country, the results of this study could be of use in future comprehensive planning for promoting health status of the country.

2. Materials and Methods

This study is a longitudinal descriptive study in which all registered deaths in Bane occurring between 2006 and 2010, regardless of the cause, were collected from the Department of Health in Kurdistan University of Medical Sciences. The collected data, then, based on Disease Category $(ICD10)_1$ of WHO_2 categorized into 21 categories. Then, the data were analyzed using SPSS, 19. Having prepared the life table for each gender and each year, life expectancy was computed for each age and gender and the total lost years of life for all chapters of ICD10 were calculated. Awareness of the causes of mortality changes over time determines the distribution of risk factors of mortality (in age and gender groups, ethnicity and so on). Given the importance of the systematic

1-International Classification Disease
[2]-Word Health organization

registration of deaths and causes of death in the country, results of this study can be used for future planning of health promotion and disease prevention.

3. Results

The study included 3130 deaths which were registered in Bane. Out of these cases, the genders of 3089 cases were known. Out of this, 1205 (38.5%) were females and 1,884 (60%) were male. 470 deaths occurred in 2005 (15%); 525 (16.8%) occurred in 2006; 535 cases (17.1%) occurred in 2007; 538 cases (17.2%) occurred in 2008; 547 cases (17.5%) occurred in 2009, and 515 deaths (16.5%) occurred in 2010. In terms of the season of death, 816 deaths occurred in spring (26.1%); 793 occurred in summer (25.3%); 747 cases occurred in autumn (23.9%) and 774 (24.7%) occurred in winter. Out of 3128 deaths for which the place of death was identified, 1449 (46.4%) occurred in village and 1679 (53.6%) cases occurred in the city. The average age of the deceased was 54.93 years in general, while this mean age for women was 58.1 and for men it was 54.03 years. There was a significant difference between the average age at death of the two genders (p=0.001; df: 2613.36; t=3.261). The average age of those who died in city was 53.87 years and for those who died in the village, it was 56.16 years. No significant difference was observed between urban and rural residents (p=0.063; df:2989.95; t=1.86).

Table 1 displays information about ICD10 chapter categories according to the frequency, average age of the deceased, proportional mortality rate in each season and accumulating years of life lost. Proportional Mortality Rate indicates the importance of disease in causing a death in the community (10).

Table 1. ICD10 chapter categories according to obtain the frequency

ICD10 chapter categories	Frequency	Rank	Percent	The mean age	PMR(%)	Total years lost
Certain infectious and parasitic diseases	3	15.5	0.1	22.97	0.09	177
Neoplasms	480	3	15.3	68.16	15.33	9066
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	5	13	0.2	42.2	0.16	204
Endocrine, nutritional and metabolic diseases	39	9	1.2	70.81	1.25	668
Mental and behavioral disorders	4	14.5	0.1	69	0.13	77
Diseases of the nervous system	293	5	9.4	75.19	9.36	4202
Diseases of the eye and adnexa	-	-	-	-	-	-
Diseases of the ear and mastoid process	-	-	-	-	-	-
Diseases of the circulatory system	1017	1	32.5	75.78	32.49	13896
Diseases of the respiratory system	110	6	3.5	58.98	3.51	3650
Diseases of the digestive system	30	11	1	66.35	0.96	621
Diseases of the skin and subcutaneous tissue	4	14.5	0.1	34	0.13	187
Diseases of the musculoskeletal system and connective tissue	13	12	0.4	78.23	0.41	178
Diseases of the genitourinary system	99	7	0.23	69.29	3.16	1906
Pregnancy, childbirth and the puerperium	3	15.5	0.1	39.67	0.09	123
Certain conditions originating in the prenatal period	381	4	12.2	0.46	12.17	27768
Congenital malformations, deformations and chromosomal abnormalities	82	8	2.6	2.83	2.62	6531
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	31	10	1	83.03	0.99	607
Injury, poisoning and certain other consequences of external causes	1	16	0	6	0.03	69
External causes of morbidity and mortality	523	2	16.7	31.79	16.71	24673

The four chapters of the ICD_{10} with the highest frequencies include circulatory diseases (n = 1008, 32.5%), external causes of death (n= 522, 16.7%), cancers (n= 480, 15.3%), and prenatal death (n= 382, 12.2%). Overall, these chapters account for 76.4% of total death. A study conducted in Iran between 1997 and 2001 reported blood circulatory diseases (45.4%), accidents and poisoning (14.9%) and malignant tumors (8.6%) respectively as the most frequent causes of death (2). In our study, for all years, women showed higher life expectancy than men. The most years of lost life was reported for prenatal period, external causes, diseases of the circulatory system and cancers. Therefore, special attention should be paid to maintaining and improving the health of babies as a vulnerable group. Given that death is largely a function of age and normally it is more frequent among children younger than one year old as well as among the elderly, categorization of occurred death based on age groups seems reasonable (10). Along these lines, the age group of younger than a year with 492 cases (15.7%) and the age group of older than 85 with 728 cases (23.3%) showed the highest mortality rate. Figure 1 shows the trend of four seasonal

changes in frequency over the five years. As this diagram shows in all years of the study, circulatory diseases were the most frequent cause of death. In 2005, infant deaths; between 2006 and 2008, incidents and accidents and in 2009 and 2010 cancers, followed circulatory diseases as the most frequent causes of death in Bane.

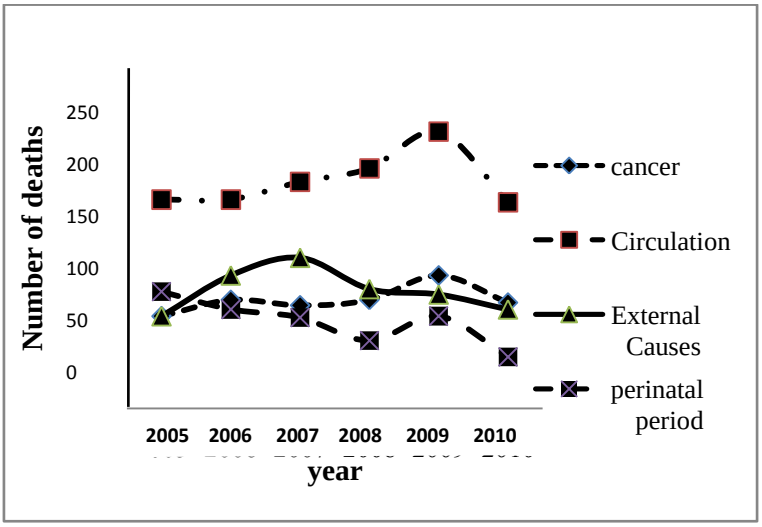

Figure 1. The change of seasons during the years 2005 to 2010

Life Table is the history of life and death of a group of people who gradually are removed from the life cycle by death and is defined as the probability of survival from age to age, In other words, life table theoretically presents the life history of a group or a generation because it is collected and calculated based on the deaths during a particular year (8). One of the important issues of demography which is often required for socio- economic development planning is predicting population for short-term, medium-term and long-term periods. Using this method is not possible without the knowledge of mortality, life expectancy and survival factors which are indices that are obtained through life-tables (9). According to the World Health Organization; the life expectancy in 2010 was 86.01. Figure 2 shows the age of life expectancy based on sex and year. As this table indicates life expectancy is higher in women than men. The maximum life expectancy was in 2010 and the minimum is in 2007.

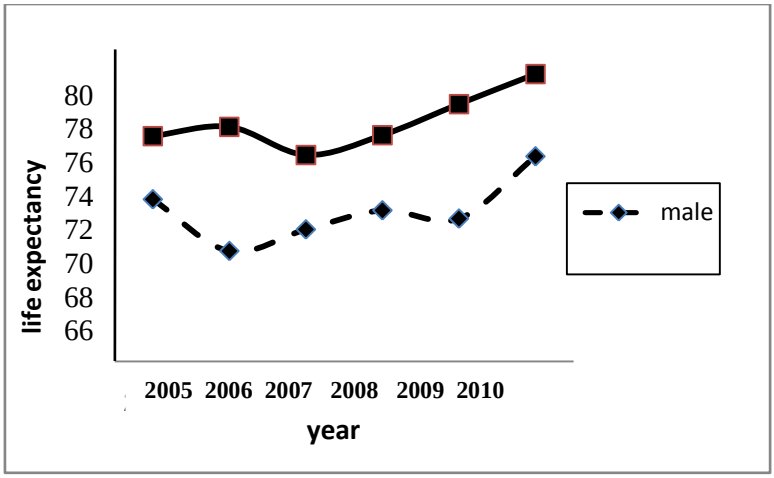

Figure 2. Life expectancy, by sex and age during the years 2005 to 2010

4. Discussion

In 2008, out of 57 million death occurred in the world, 36 million (about two-thirds) were due to non- confutations diseases including cardiovascular, cancer, diabetes and chronic lung diseases. Around a quarter of non- contagious diseases occurred before the age of 60. Around 80 percent (29 million) occurred in countries with low and middle income (12). Cardiovascular diseases, incidents and accidents, and cancers are the most frequent causes of death. Among the main reasons of death in the first group is high blood pressure, lack of physical activity, smoking, not consuming enough fruits and vegetables, and in the second group the reasons include not breaching traffic rules, high speed and so on. In conclusion it can be said that planning the future of a country should be more concerned with the reduction of non-communicable diseases. Since the sum years of lost life was the highest in the prenatal period, it is necessary to improve pregnancy care and teach mothers prior to pregnancy. Maintaining and improving the health of babies as a vulnerable group should receive special attention.

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