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Trends and Patterns of Mortality in China, Japan and India: A Comparative Analysis

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Abstract: Mortality refers to death that occurs within a population. It is linked to many factors like, age, sex, race, occupation, social class etc. The incidence of death can reveal much about a population's standard of living and health care. But this study explores the mortality trends and patterns of China, India and Japan through descriptive methods by comparing and analyzing the mortality indicators-Crude Death Rate(CDR), Infant Mortality Rate(IMR), Under 5 mortality rate and Life Expectancy at Birth over times of last 50 years. Here it can be stated that CDR is a good indicators to compare death rates between countries before making inferences about a country's health, economic, or environmental condition. Infant Mortality rate is a good indicator of the health status of a population. Life expectancy at birth is also a good indicator of a current health condition. Life expectancies differ widely among countries. It can be noted that low life expectancies in developing countries are in large part of the result of high infant mortality rates. This study indicates that all mortality indictors used here do not explore the same features among the countries in all situations but also indicates the association between the indicators regarding mortality process whereby death occur in the population. In this respect the study indicates that's the overall extent of mortality in Japan is low having highest life expectancy and lowest infant mortality and crude death rate; India is high having highest crude death rate and lowest life expectancy at birth and China is in between where increasing life expectancy at birth and decreasing death rates are dominant. This explores that Japan has the better health status following the CDR, IMR and Life Expectancy at Birth over times. India has a low life expectancy at birth that is large part of the result of high infant mortality rates.

Key words: Mortality, population social class

INTRODUCTION

Mortality is an important component of population change which can be viewed from demographic, medical, social, economic and cultural stand point of views. For changing mortality scholars emphasized the importance on improved nutrition, levels of income and living standards as well as public health, social organization and scientific advancement. The pattern and trends of mortality in the developed and developing countries and regions of the world are not sharing the same characteristics as there are much disparity exists between them and this distinct feature is common to the whole world as well the Asia-the largest population base-3.9 billion (UNFPA,[1]) where China, India, Indonesia, Pakistan, Bangladesh and Japan are contributing more than 100 million inhabitants (UN,[2]).The stated top most Asian populated countries are in between the rank of the top 10 world order. Since 1950s, most countries have seen an increase in life expectancy and a reduction in infant mortality. Reductions are particularly dramatic in developing countries. Despite improvements in indicators such as life expectancy or infant mortality within past 50 years, widespread variations remain .It can be assumed that consistently improving health indicators in one hand and in other poor indicators of health care are in behind these where developed world shared the first one and the developing world the second. In this respect this study makes an attempt to comprehend the mortality pattern in the three Asian countries-China (GNI per capita PPP $ 4,990), India (PPP $2,880) and Japan (PPP$ 28,620) - those belong to developing and developed world to seek for the differences as well as the homogeneity regarding the mortality- one of the most important demographic process by analyzing and comparing the patterns and trends (UNFPA,[1]).

OBJECTIVES

The overall objectives of this study are to comprehend the mortality trends and patterns of the three Asian countries-China, Japan and India and to identify

the similarity and differences regarding morality indicators among them to get a clear conception about the health, economic and environmental conditions under mortality criteria. By analyzing the trends and patterns of these selected countries this study aims to seek the major mortality features sharing last 50 years of time and to make the relations among the mortality indicators.

MATERIALS AND METHODS

Descriptive method through comparison has been used to analyze the trends and patterns of mortality of the selected countries by analyzing the Crude Death Rate (CDR), Infant Mortality Rate (IMR), Under 5 Age Mortality Rate and Life Expectancy at Birth as major mortality indicators by measuring the time series (1550-2005) status. Although there are also some other mortality indicators but CDR, IMR and Life Expectancy at Birth are the crucial to extent the mortality for comparing the overall situation (e.g. health, economic, environment) of the countries having the international comparison even the sources of data varied each other. The definition of the major indicators used here as followed:

Crude death rate (CDR): The ratio of deaths in a year to the mid year population or more generally, the ratio of deaths in any specified period to the number of person-years lived in that period. The value is conventionally expressed per 1000.Thatmeans; CDR is the number of deaths per 1,000 populations in given year. CDR is affected by many population characteristics, particularly age structure. It is therefore prudent, when comparing death rates between countries, to adjust for differences in age composition before making inferences about a country's health, economic, or environmental conditions.

Infant mortality rate (IMR): The number of deaths during a specified period (often a year) of live-born infants who have not reached their first birth day, divided by the number of live births in that period and usually expressed per 1000.Thatmans infant mortality rate is the number of deaths of infants under age 1 per 1,000 live births in a given year. This is considered a good indicator of the health status of a population.

Under-five mortality rate: Under five Mortality rate is the probability (expressed as per 1000 live births) of a child born in a specific year dying before reaching five years of age, if subjected to current age- specific mortality rates.

Life expectancy at birth: The average number of years a newborn infant can expect to live under current mortality levels. Life expectancy at birth is the most widely used as an indicator of mortality conditions. Generally life expectancy is a hypothetical cohort measure based on current death rate and actual death rates change over the course of a person's lifetime.

Sources of data: Here most of the data comes from the United Nations Population Division. The UN data (2004) as well as Population Reference Bureau (PRB,[5]) have been used for international comparison even national data varies from each other in some respect and also for the unavailability. The United Nations Population Division data since 1950 to 2005 have been used here. It can be noted that the UN data have been projected and four indicators (crude death rate, infant mortality rate, mortality under age 5 and life expectancy at birth) are used to analyze and to compare the countries. Among the four indicators mortality data under age 5 are not available and for that it only applied for the years of 1995-2000 and 2000-2005.

Findings and data analysis: Given below Table 1, Fig. 1-5 indicate the trends and patterns of mortality and life expectancy pattern in China, Japan and India where we get the comparative as well as the specific country's relevant features in courses of time. For China the United Nations Population Division, Population Reference Bureau and Official data(for example) have used but for Japan and India data come from the United Nations(UN) and Population Reference Bureau. Although the sources of data varied from each other but we can explore the trends and pattern among the stated countries in Asia regarding mortality and life expectancy. For example, Chinese official data presents that of crude death rate and life expectancy at birth derived from the population censuses which declined more than half by 2000 when it was 14.0 in 1953 and dropped to 6.42 in 2004.Life expectancy at birth increased slightly during the third (1982) and fourth (1990) censuses but after that during 10 years interval it increased more rapidly than before and reached to 71.4 years (China,[5]).But the projected data of UN differs in some context. In case of Japan the projected data indicates that CDR in 2000-2005 is 3.2 but the fact sheet indicates it 8 per 1000 population (UN,[2]).

Table 1: Selected mortality indicators, china, japan and India-1950-2005

Country	Year	Crude death rate	Infant mortality rate	Life expectancy at birth
China	1950-55	25.1	195.0	40.8
	1955-60	20.7	178.7	44.6
	1960-65	17.1	120.7	49.5
	1965-70	10.9	80.8	59.6
	1970-75	6.3	61.1	63.2
	1975-80	6.7	52.0	65.3
	1980-85	6.6	52.0	66.6
	1985-90	6.7	50.0	67.1
	1990-95	7.3	47.1	68.1
	1995-2000	7.0	41.5	69.7
	2000-05	6.8	37.4	72.5
Japan	1950-55	9.4	50.6	63.9
	1955-60	8.2	36.8	66.8
	1960-65	7.3	24.5	69.0
	1965-70	6.9	15.6	71.1
	1970-75	6.5	11.5	73.3
	1975-80	6.1	8.7	75.5
	1980-85	6.1	6.5	76.9
	1985-90	4.9	4.9	78.3
	1990-95	4.4	4.4	79.5
	1995-2000	3.8	3.8	80.5
	2000-05	3.2	3.2	81.9
India	1950-55	25.4	190	38.7
	1955-60	22.2	173	42.6
	1960-65	19.8	157	45.5
	1965-70	17.7	145	48.0
	1970-75	15.9	132	50.3
	1975-80	13.9	129	52.9
	1980-85	12.9	105	54.8
	1985-90	11.6	94.5	57.2
	1990-95	10.4	84.9	59.5
	1995-2000	9.4	76.2	61.5
	2000-05	8.8	67.6	63.1

Source: United Nations, 2004

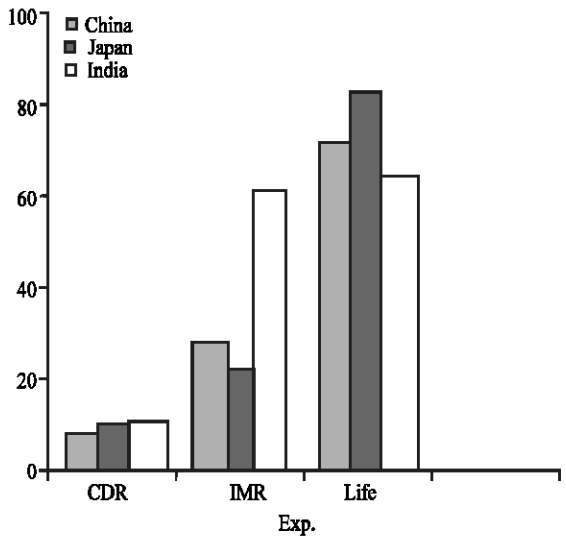

Fig. 1: Selected mortality indicators in china, japan and India, 2005, data source: PRB, 2005

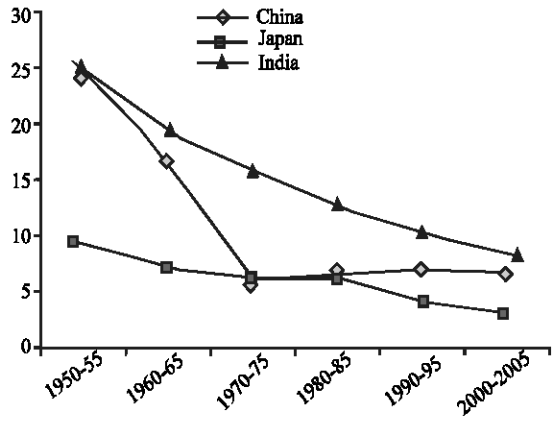

Fig. 2: Crude death rate (per 1000 population) in China, Japan and China, 1950-2005 Source: United nations, 2004

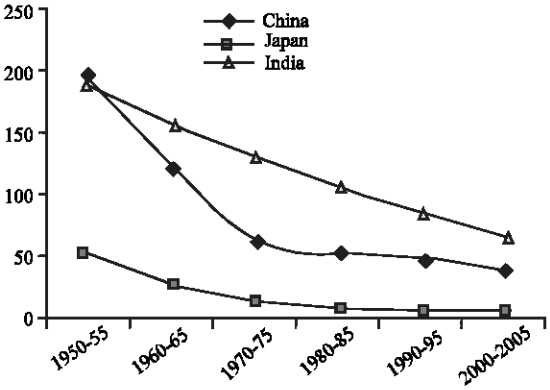

Fig. 3: Infant mortality rate (per 1000 live birth) in China, Japan and China, 1950-2005

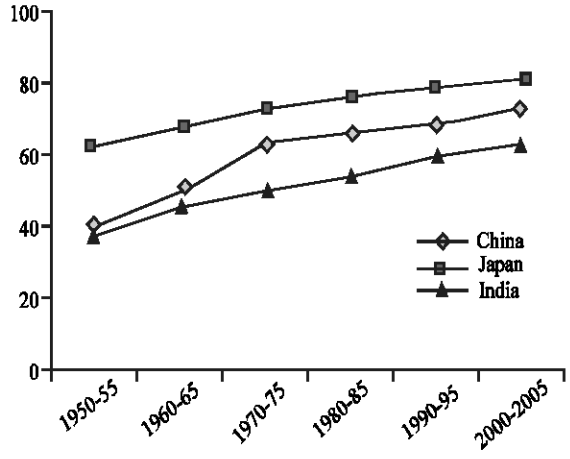

Fig. 4: Life expectancy at birth in China, Japan and China, 1950-2005 source: United nations, 2004

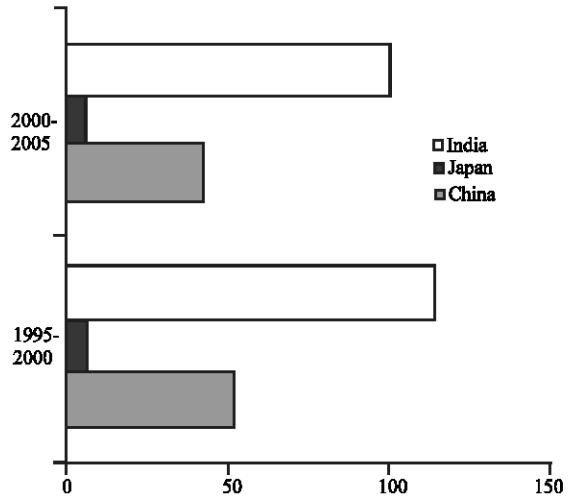

Fig. 5: Mortality under age 5 in China, Japan and China, 1995-2005 source: United nations, 2004

Table 1 reports the crude death rate, infant mortality rate and life expectancy at birth in 2005 among three countries where it is revealed that Japan has reduced the infant mortality very successfully where the rate is only 2.8 per 1000 live births. The life expectancy at birth in Japan is also better than China and India. Infant mortalityis highest and life expectancy at birth is the lowest in India which indicates the association between the stated two indicators. Although in China the crude death rate is the lowest but the infant mortality and the life expectancy at birth is in the middle position. The table reports a common phenomenon for all three countries where life expectancy at birth for female is always higher than male but the difference among male and female is the highest (7 years) in Japan while in China and India it is 4 and 2 years.

In 1950-1955 China and India share the same attributes regarding crude death rate, infant mortality and life expectancy at birth but after the courses of time China promoted more significantly than India regarding all the stated indicators. For example, infant mortality per 1000 live births in China and India in 1950-1955 was 195 and 190 but the figure declined to more than 6 times by China in 2000-2005 where India followed 3 times. But in case of Japan the situation regarding all the indicators was always in better position than China and India.

However, here even the projected data after 2005 are not shown here but it is found that crude death rate is increasing in China after 2005 although the infant mortality rate is in declining trend. This is the effect of aging mortality. The crude death rate will be 13.4 by 2050 (United Nations,[6]). Currently Japan has been sharing this pattern. Up to 1985-90 Japan continued to reduce its crude death rate but after that the rate has been in accelerating trend which is predicted to be 13.3 by 2040 and 14 by 2050.

Figure 5 presents the scenery of under 5 age of mortality of the countries during the period of 1995-2005. Before 1995 the data are not available. Therefore, here it only used for a limited period where the mortality rate is highest in India; lowest is in Japan and China in between. The Fig. 2 also present that the situation is improving by the years.

CONCLUSION

China, India and Japan-the three Asian countries are the home of the largest population base (2547.3 millions) of the world where distinct features of mortality are prevailed over times of the last 50 years (UNFPA,[1]). Association regarding mortality has been found among these countries where reducing death rate and increasing life expectancy is significant. Although there are various mortality indicators but CDR, IMR and Life Expectancy at Birth are applied to extent the mortality for comparing the countries as these indicators reflects the overall health, economic, environmental condition. This study indicates that the overall extent of mortality in Japan is low having the highest life expectancy and the lowest infant mortality and crude death rate referring better health status; India is high having the highest crude death rate, infant mortality rate and the lowest life expectancy at birth and China in between. The indicators used here differ widely among countries. It can be noted that low life expectancies in developing countries (like India) are in large part of the result of high infant mortality rates. It can be argued that that all mortality indictors used in this study do not explore the same features among the countries in all situations but indicates the association regarding mortality process whereby death occur in the population.

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