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EPIDEMIOLOGICAL TRANSITION: A STUDY ON THE TRENDS OF COMMUNICABLE MORBIDITIES IN INDIA

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Abstract
*Despite various efforts put forwarded to improve the health status of vast populations from high rates of morbidity and mortality, India could not achieve health transition even after sixty- eight years of independence. Further, along with the demographic transition, India is passing through the phase of epidemiological transition and experiencing significant changes in health and disease pattern over the years**.** Despite having considerable burden of non-communicable disease, a large number of people in the country are still suffering from communicable or infectious diseases. Acute respiratory infection contributes major part of the communicable diseases and morbidity due to acute diarrhoeal disease, malaria, pulmonary tuberculosis still dominant in the country. These emerging communicable diseases are the matter of concern of the health professionals, researchers and policy makers in India. Therefore, it is imperative to population level estimates of morbidity prevalence of communicable diseases to understand the burden of disease of the country.*

Key words: Epidemiological Transition, Morbidity, Communicable Diseases.

INTRODUCTION

Health is a basic need and it is an important factor contributing to human well-being. In addition, "the promotion and protection of the health of the people is essential to sustain economic and social development and contributes to a better quality of life and to world peace" (UNICEF, 1978). With the other parts of the world, India has been putting many efforts to improve the health status of vast populations from high rates of morbidity and mortality since independence. But the country has not achieved health transition even after sixty- eight years of independence. Further, World Health Report, 2011 reveals that India ranks fifth in the world's share of diseases; third in diarrhea, TB, respiratory, and other infections and parasitic diseases, peri-natal conditions; fifth in nutritional deficiencies, diabetes, Cardio Vascular Diseases; a quarter of maternal ill-health and second largest number of HIV/AIDS cases after South Africa. Beside these, due to rapid urbanization, environmental degradation, physical inactivity, changing lifestyle etc, every society across the globe is experiencing significant changes in their patterns of health and disease (Mensah and Aikins, 2010; Nongkynrih et al., 2004) and India is no exception to it either**.** More specifically, India is passing through the phase of demographic as well as epidemiological transition along with other parts of the world (Varatharajan, 2011; Bloom et al., 2013). Currently, like other developing countries, India has the double burden of diseases (Boutayeb, 2006) i.e., infectious diseases among the economically vulnerable group of people and non-communicable diseases are among the upper class of society. Moreover, emerging infectious or communicable diseases have drawn the attention of the public as well as the scientific community (Barret et al., 1998). These emergence and reemergence of infectious diseases have captured the attention of the scientists and the public (Harper and Armelagos, 2010). Recently demographers and health care professionals, researchers and health policy makers in India, are paying more attention on morbidity indicators to get a true picture of health status and personal wellbeing of the community as a whole (Murray, 1998; Duriasamy, 1998; Dilip, 2002; Ghosh, 2005, 2010). Therefore, it is very much essential to population level estimates of morbidity for the assessment of the burden of disease of the country.

THEORETICAL BACKGROUND OF EPIDEMIOLOGICAL TRANSITION

Recognizing the limitations of demographic transition theory (Kirk, 1996), Omran (1971) developed a comprehensive approach to population dynamics, known as 'epidemiologic transition theory' which "focuses on the complex change in patterns of health and disease and on the interactions between these patterns and their demographic, economic and sociologic determinants and consequences" in a variety of social contexts. According to Omran, every society in the modernization process has to pass through three successive stages of transition : a)the age of pestilence and famine with high but fluctuating mortality and average life expectancy at birth 20-40 years, b) the age of receding pandemics with rapidly declining mortality and average life expectancy at birth 30-50 years, and c) the age of degenerative and man-made diseases with disappearance of infectious diseases and emergence of chronic degenerative diseases and average life expectancy at birth increases up to 70 years (Omran, 1971, 1982). All these particular successive events put an important trade-off between mortality and morbidity of the people in the society. It is also observed that while on the one side, decrease in infectious diseases results in reduction in child and maternal mortality and on the other side, and increase in life expectancy results in

aging population with increasing mortality from chronic degenerative diseases (Barret et al., 1998). Later, two other stages (Olshansky and Ault, 1986; Rogers and Hackenberg, 1987) were added to original model of Omran. The fourth stage is the 'age of delayed degenerative diseases' whereby degenerative diseases like cardiovascular diseases and cancers remain as chief cause of mortality, but improvement in medical technology increases the life expectancy of elderly people suffering from those non-communicable diseases (Applin G, Beggs G, et al .1999). The fifth stage is known as the 'age of emergent and re-emergent infections' where both old and new infectious and parasitic diseases again emerge as the cause of morbidity and mortality in the society (Smallman-Raynor M et al., 1999). To support the theory, four models of transition were proposed: the classical or western model belongs to England and Wales and Sweden; the accelerated transition model belongs to Japan; the contemporary or delayed model belongs to Chile and Ceylon; and the transitional variant of delayed model belongs to Taiwan, South Korea, Singapore, Sri Lanka, Hong Kong, Mauritius (Omran, 1971, 1983).

CRITICAL EVALUATION OF EPIDEMIOLOGICAL TRANSITION THEORY

Despite Omran's transition theory has been widely accepted in many countries of the world, it is not free from criticism. Policy makers, demographers and health professionals find it difficult to address the transition in developing countries as the rate of epidemiological transition of these countries is very fast compared to the other countries **(Reddy et al., 1998; Karar, 2009; WHO, 2010).** Transition model does not fit with Latin America because on one side, the country was experiencing re-emergence of malaria and dengue fever and on the other side, the country was having burden of infectious as well as chronic degenerative diseases. To explain the health status of the people , they conceptualized 'protected polarized model' which describes the coexistence of communicable (both old and new emerging infectious diseases) and non-communicable diseases(Frenk et al., 1989).The model was applied in Accra, a capital city of Ghana, a sub Saharan African Country and found that

1. mainly, poor communities were experiencing communicable or infectious diseases;
2. wealthy communities were experiencing the increasing prevalence of non-communicable diseases as the chief cause of morbidity and mortality and
3. The arrival and increased impact of the HIV/AIDS epidemic.

The study also found that during 2001 onwards, circulatory diseases were the main reasons of mortality, followed by infectious and communicable diseases, diseases of the respiratory system and neoplasm, chronic diseases such as stroke and hyper tension, injury and poisoning in the region (Mensah and Aikins, 2010).Further, others opined that the theory is restricted to a particular set of historical circumstances whereby cause of mortality shifts from acute infectious diseases to chronic, non-infectious, degenerative and man-made diseases (Barret et al., 1998). Others (Weisz and Gryn, 2010) opined that theory is not concerned with disease but the transition from high birth rate to low birth rate and their causes and causes. Further, the model does not include mortality trends that result from accidents, suicide, homicides and other injuries, or captures the complex multi-factorial interplay in the causes of death and diseases (Martinez and Leal, 2003).

MORBIDITY TREND (2001-2009) OF COMMUNICABLE DISEASES IN INDIA

Though mortality indicators were considered as a good proxy for overall health status of the population, researchers (Murray, 1998; Duriasamy, 1998; Dilip, 2002; Ghosh, 2005, 2010) replacing the mortality indices, used morbidity indicators for the assessment of the burden of disease. Mortality data is not reliable rather scarce in most of the developing countries because these countries do not keep the record of cause- specific mortality or age-specific mortality data. Rather, death registration system has not been developed or not up-to-date like developed countries. Further, hospitalization rate is also low and mostly deaths occur at home. In addition, mortality rates, sometimes, can provide misleading picture of the health status of the people and moreover, morbidity measurement can be done in a cost effective way in comparison to mortality measurement (Dilip, 2001). Further, in many developing countries, the majority of deaths occur at home, and consequently, accurate information on cause-specific mortality is scarce. The verbal autopsy has been used extensively to obtain cause-specific mortality data, but it cannot be presumed to be completely reliable. Thus the study of morbidity becomes important for evaluation of the burden of disease of the country, state or any region (Duriasamy, 1998).

Table 1: The Morbidity Trend of eight communicable diseases in India*

year	Acute Respiratory Infection	Acute Diarrhoeal Disease	Malaria	Pulmonary Tuberculosis	Enteric Fever	Pneumonia	Gonococcal	All Viral Hepatitis	Total
2001	20555848	9287758	2055023	471658	490377	549197	121207	149262	**33680330**
2002	22139666	9441456	1841229	623323	488033	576630	125029	135859	**35371225**
2003	24250256	10510476	1869403	906472	596684	655150	147517	151287	**39087245**
2004	27486422	10487238	1915363	1188412	685960	699010	164105	236493	**42863003**
2005	25736563	10978459	1816569	1293083	695114	774023	147715	181621	**41623147**
2006	26152957	10213917	1785129	1397498	789004	681560	128373	152623	**41301061**
2007	26171496	10993639	1508927	1475587	820360	746714	157222	110055	**41984000**
2008	27404541	11384548	1526210	1517333	930899	731342	133894	92179	**43720946**
2009	28240346	11984490	1563574	1533309	1099331	801391	148080	124085	**45494606**
Total	**228138095**	**95281981**	**15881427**	**10406675**	**6595762**	**6215017**	**1273142**	**1333464**	

**Source: Emergency Medical Relief Division, Directorate General of Health Services, MOHFW/GOI.*
Website: www.mohfw-h1n1.nic.in

The Morbidity Trend (2001-2009) is based on the information received in the past and revised in succeeding year (s)from States/UTs, in respect of these eight communicable diseases reporting around one lakh or more cases. From the above table it is clear that in 2001, reported morbidity cases were 33680330 and in 2004 it turned into 42863003 and then it started falling till 2006. During 2008, reported case of eight communicable diseases became 43720946 which is an increase from 41984000 in 2007 and during 2009, it reached at 45494606. Disease- wise analysis indicates that acute respiratory infection contributes major part of the communicable diseases and morbidity due to acute diarrhoeal disease, malaria, pulmonary tuberculosis is still dominant in India. Further, every year considerable number of morbidity cases due to enteric fever and pneumonia is reported and these numbers are continuously rising. Reported cases of acute diarrhoeal disease are continuously increasing and it reached at 11984490 in 2009. Though little fluctuation is found in case of prevalence of malaria but it shows decreasing trend during 2001-2009. Morbidity prevalence of Pulmonary Tuberculosis poses a major challenge in the country and it increased to1533309 in 2009 from 471658 in 2001. Prevalence of enteric fever is rising rapidly and it reached more than double during 2001-2009.

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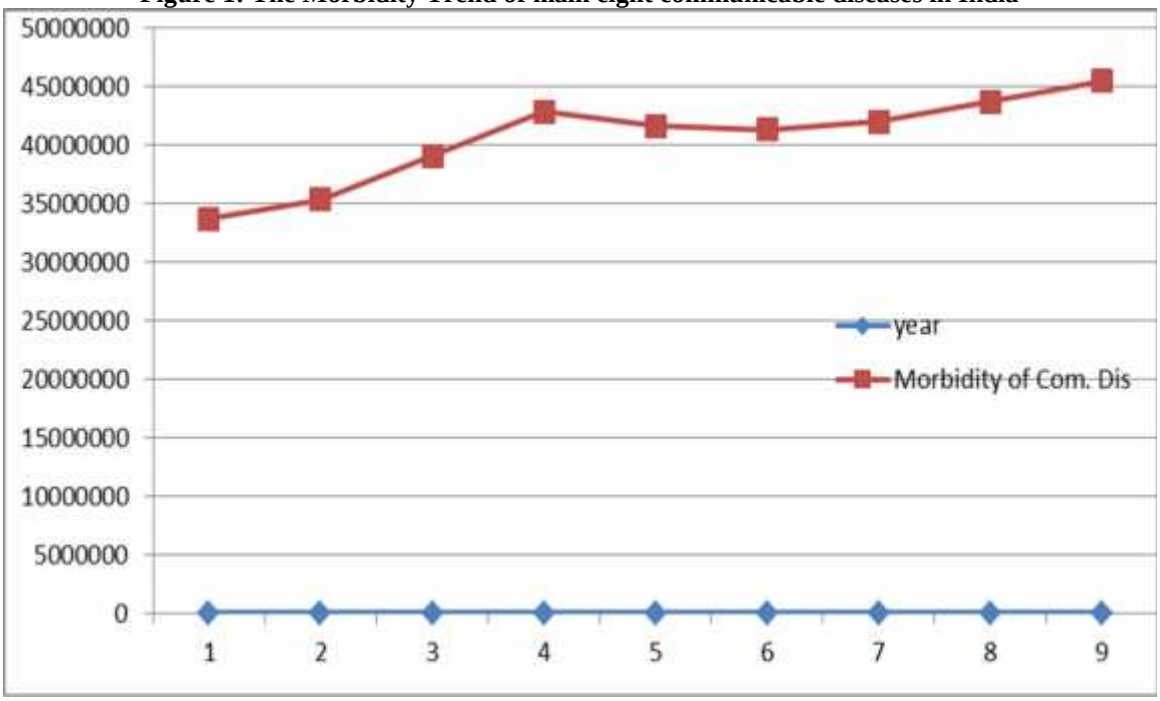
Figure 1: The Morbidity Trend of main eight communicable diseases in India



Source: Self elaboration by the author

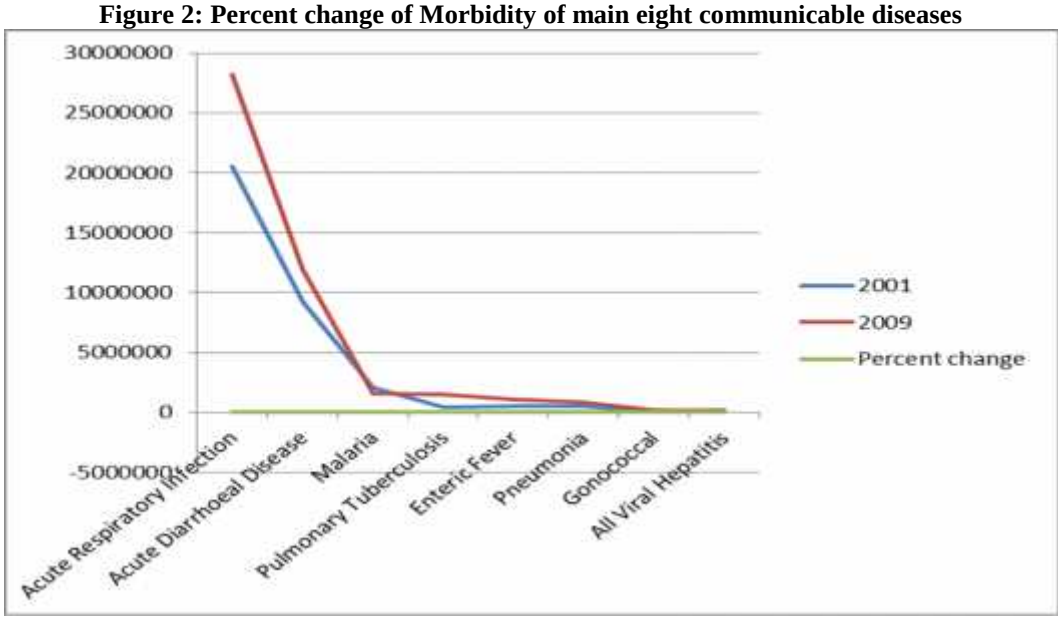
Year –wise analysis reveals that number of cases of communicable diseases is steadily rising from 2001 to 2004, and then succeeding two years recorded falling trend and again from the year 2007 onwards, it is showing upward trend and continued. It is also evident that morbidity prevalence was at high during 2004 and thereafter, it started falling but after 2007 onwards, again it started rising up and continues.

Table 2: Percent change of Morbidity of main eight communicable diseases

Communicable Diseases	**2001**	**2009**	**Percent change**
Acute Respiratory Infection	20555848	28240346	37.4
Acute Diarrhoeal Disease	9287758	11984490	29.0
Malaria	2055023	1563574	-23.9
Pulmonary Tuberculosis	471658	1533309	225.1
Enteric Fever	490377	1099331	124.2
Pneumonia	549197	801391	45.9
Gonococcal	121207	148080	22.2
All Viral Hepatitis	149262	124085	-16.9

Source: Self elaborated by the author.

Figure 2: Percent change of Morbidity of main eight communicable diseases



Source: Self elaboration by the author.

Table shows the comparative figure of major communicable diseases with the percentage change during 2001-2009. Record reveals that all the diseases except malaria and all types of viral hepatitis have increased considerably during these periods. Pulmonary Tuberculosis and Enteric Fever has increased largely with around 225 percent and 124 percent respectively. On the other hand, morbidity due to Malaria and All Viral Hepatitis has decreased to around 24 percent and 17 percent respectively.

CONCLUSION

Epidemiological transition theory describes how cause of mortality and pattern of morbidity changes with the socio-economic development and modernization or urbanization of the society as well as the country. Theory also asserts that during transition, a long-term shift occurs in disease patterns and mortality whereby pandemics of acute infectious diseases are gradually displaced by chronic, non-infectious, degenerative and man-made diseases, and these diseases, further, emerge as the major form of morbidity and leading cause of death. But the present study reveals the fact that there is considerable burden of communicable diseases in India though the county is characterized by developing economics. As per the theory, morbidity prevalence of communicable should disappear as the country moves from less developed pattern of economy to developing counterparts. Though many efforts have initiated by the Govt. of India over the years, acute respiratory infection contributes major part of the communicable diseases and morbidity due to acute diarrhoeal disease, malaria, pulmonary tuberculosis remains in India. Further, with the reported cases of acute diarrhoeal disease, every year a considerable number of morbidity cases due to enteric fever and pneumonia is reported and this number is continuously rising. Despite notable reduction in malaria and all types of viral hepatitis cases over the years, morbidity prevalence of pulmonary tuberculosis poses a major threat in the country and it has increased by more than two hundred percent during the period of eight years. Thus we can conclude that with the socio-economic development of the country, morbidity of the large section of country due to communicable diseases is still present with considerable number.

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