

# **Sex Gaps in Potential Gain in Life Expectancy after Partial and Complete Elimination of a Specific Cause of Death in Urban India**

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## **Introduction**

Life expectancy is a statistical measure of the average time a person is expected to live at a given age under given age specific mortality rates (Preston et al, 2001). It is not only a summary measure of mortality but also an accepted indicator of development of a country (Shryock, et al., 1971; Prasartkul and Vapattanawong, 2001).

Potential gain in life expectancy by eliminating a disease means that on average people will live more than they would in the presence of that disease. Lowering death rate due to diseases at young ages will contribute more to life expectancy compared with the same percentage point reduction in death rate at older ages. So a gain in life expectancy has the potential to call attention to a disease condition.

Life table technique helps in examining the effect of a specific cause of death elimination in life expectancy. One gets an idea about the gain in life expectancy if one is able to control a specific disease.

The measurement of cause-specific mortality is needed for several purposes *viz.*, (i) to establish the relative public health importance of different causes of death; (ii) to evaluate the probable impact of intervention programmes; (iii) to investigate the circumstances surrounding the death of children from specific causes and to devise effective actions to decrease mortality; (iv) to investigate the reason for differing rates of infant and child mortality between geographical areas; and (v) to evaluate the effectiveness of specific health intervention in controlled settings (WHO/UNICEF, 1994).

India does not have good quality data on health situation of its population particularly the rural population where three-fourth of its total population lives. Information on causes of death is of key importance in understanding the determinants of health and mortality (Palloni, 1991). Reddy (1993) pointed out that cause of death information from hospital based data suffer from several types of selection biases and do not provide a true picture of the population. In India, reliable standardized cause-specific mortality rates are not computed because of unsatisfactory death certification even for the urban population (Bhat 1991, 1995).

In this study an attempt has been made to estimate sex gaps in potential gain in life expectancy after partial and complete elimination of a specific cause of death in urban India.

## **Data and Methodology**

Medical Certification of Causes of Death (MCCD) data for the year 2015 have been used in the study (RGI, 2017). The MCCD under Civil Registration System was implemented in the states/union territories to provide data on the cause of death under the provisions of Registration of Births and Deaths (RBD) Act, 1969. However, it has only been implemented in certain hospitals, generally in urban areas which are selected by the Chief Registrar of Births and Deaths. Thus, the scheme covers mostly those deaths, which occur in medical

institutions located in urban areas. Some of the states have notified only teaching and specialised hospitals under it, whereas in others, only district hospitals and Primary Health Centres are under its ambit. Under the scheme, the Office of the Registrar General, India (ORGI) obtains data on medically certified deaths as collected, compiled and tabulated by the Offices of the Chief Registrars of Births and Deaths of the States/UTs. It has been operational in the country, but with varying levels of efficiency across the States/Union Territories. The percentage of medically certified deaths to total registered deaths during 2015 was 22% for India.

Data derived from MCCD is tabulated in conformity with the International Classification of Diseases (ICD) - Tenth Revision (1993) (WHO, 1993). It has been adopted in the Office of the Registrar General, India (ORGI) for classification of causes of death since MCCD 1999 report. The statistics on medically certified causes of deaths is being tabulated as per the National List (ICD –10, modified according to Indian conditions). The underlying cause of death is taken into account while tabulating the cause-specific mortality (RGI, 1995). The MCCD data is collected according to ICD-9 classification from 1990 to 1998 and ICD-10 classification from 1999 to 2015. Detailed information is available elsewhere (Gulati, 2015).

For constructing abridged life tables method developed by Greville has been used (Greville, 1943). Life tables were prepared by using MCCD data after distributing the deaths under the head “age not stated” in all the age groups in proportion to total deaths at those age groups. Cause-eliminated life tables were prepared for all causes of death to measure the potential gain in life expectancy. Gain in life expectancy is the difference of life expectancies in the two life tables. Results of 25%, 50%, 75% and 100% elimination of ten leading causes of death have been presented.

## **Results**

Cause elimination life tables have been constructed for all causes of death after partial and complete elimination of cause of death and the results are given in tables.

The maximum gain in life expectancy at birth is due to elimination of the diseases of the circulatory system (female 13.14 years vs male 11.10 years).

## **Discussion**

This study highlights the influence of each cause of death on the mortality scenario and ascertains the effect of causes of death on life expectancy in India. The pattern of death by cause reflects the health status of the study population and in turn provides a rational basis for health planning.