Chronic Diseases – Economic Implication in India

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Abstract

Chronic diseases are diseases of long duration and generally slow progression. Worldwide, the cost of chronic diseases and their risk factors – as measured by cost-of-illness studies – is significant and sizeable, ranging from 0.02% to 6.77% of a country's GDP. Chronic diseases lower household income levels, labour productivity and social mobility, decrease the labour supply and bring forward retirement. They can increase reliance on the state through elevating levels of unemployment, disability and welfare participation. Employers absorb a significant portion of the economic burden of chronic diseases through absenteeism, decreased on-the-job productivity and increased employee turnover. The expense to employers is increased where they carry costs for health insurance, as is often the case in highly developed countries.

Healthcare - Indian Overview
Introduction

Health and Health Care need to be distinguished from each other for no better reason than that the former is often incorrectly seen as a direct function of the latter. Health is clearly not the mere absence of disease. Good Health confers on a person or groups freedom from illness - and the ability to realize one's potential. Health is therefore best understood as the indispensable basis for defining a person's sense of well being. The health of populations is a distinct key issue in public policy discourse in every mature society often determining the deployment of huge society. They include its cultural understanding of ill health and well-being, extent of socio-economic disparities, reach of health services and quality and costs of care and current bio-medical understanding about health and illness.

Health care covers not merely medical care but also all aspects pro preventive care too. Nor can it be limited to care rendered by or financed out of public expenditure- within the government sector alone but must include incentives and disincentives for self care and care paid for by private citizens to get over ill health. Where, as in India, private out-of-pocket expenditure dominates the cost financing health care, the effects are bound to be regressive. Heath care at its essential core is widely recognized to be a public good. Its demand and supply cannot therefore, be left to be regulated solely by the invisible hand of the market. Nor can it be established on considerations of utility maximizing conduct alone.

Healthcare is one of India's largest sectors, in terms of revenue and employment, and the sector is expanding rapidly. During the 1990s, Indian healthcare grew at a compound annual rate of 16%. Today the total value of the sector is more than $34 billion. This translates to $34 per capita, or roughly 6% of GDP. By 2012, India's healthcare sector is projected to grow to nearly $40 billion. The private sector accounts for more than 80% of total healthcare spending in India.

Unless there is a decline in the combined federal and state government deficit, which currently stands at roughly 9%, the opportunity for significantly higher public health spending will be limited. 1

The healthcare industry is expected to increase in size from its current € 12.72 billion to € 29.6 billion by 2012. India will spend € 33.8 billion on healthcare in the next five years as the country, on an economic upsurge, is witnessing changes in its demographic profile accompanied with lifestyle diseases and increasing medical expenses. Revenues from the healthcare sector account for 5.2 per cent of the GDP and it employs over 4 million people. By 2012, revenues can reach 6.5 to 7.2 per cent of GDP and direct and indirect employment can double. Growing population and economy driver of growth in the healthcare sector is India's booming population, currently 1.1 billion and increasing at a 2% annual rate. By 2030, India is expected to surpass China as the world's most populous nation. By 2050, the population is projected to reach 1.6 billion.

This population increase is due in part to a decline in infant mortality, the result of better healthcare facilities and the government's emphasis on eradicating diseases such as hepatitis and polio among infants. In addition, life expectancy is rapidly approaching the levels of the western world. By 2025, an estimated 189 million Indians will be at least 60 years of age—triple the number in 2004, thanks to greater affluence and better hygiene. The growing elderly population will place an enormous burden on India's healthcare infrastructure.

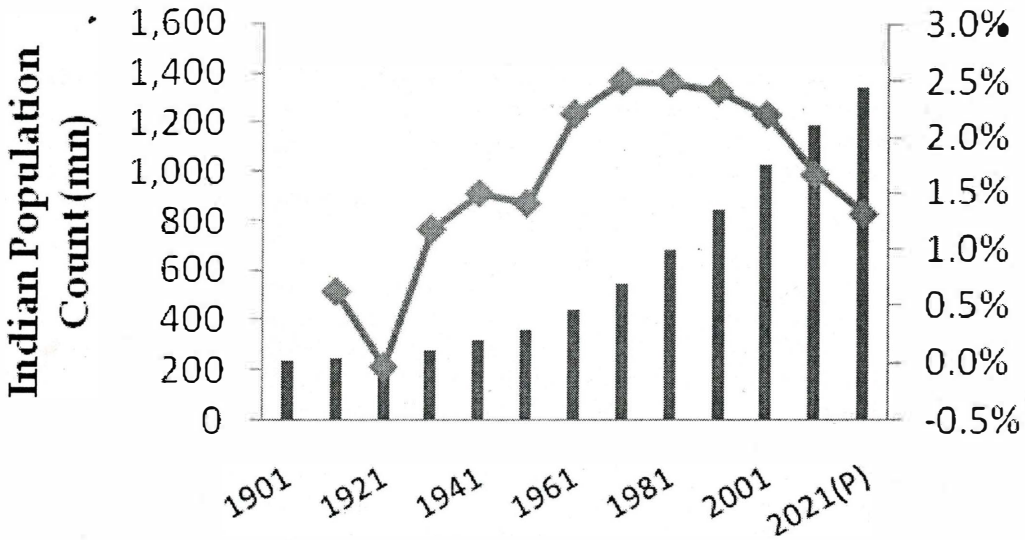
The Indian healthcare sector constitutes of the following:

* Medical care providers: physicians, specialist clinics, nursing homes and hospitals
* Diagnostic service centers and pathology laboratories
* Medical equipment manufacturers
* Contract research organizations (CRO's), pharmaceutical manufacturers
* Third party support service providers (catering, laundry)

Hospitals serve an important function in India's healthcare system. They provide in-patient and out-patient services and also support the training of health workers and research. Indian hospitals can be broadly classified as public hospitals, private and not-for-profit hospitals. Corporate hospital chains that provide tertiary healthcare services in large towns and cities have also been established. The public healthcare system consists of healthcare facilities run by the central and state government which provide services free of cost or at subsidized rates to low income group in rural and urban areas.

Healthcare spending in India accounts for over 5 per cent of the country's GDP. Out of this, the public spending in percentage is around 1 per cent of GDP. The presence of public health care is not only weak but also under-utilized and inefficient. Meanwhile, private sector is quite dominant in the healthcare sector. Around 80 percent of total spending on healthcare in India comes from the private sector. Inadequate public investment in health infrastructure has given an opportunity to private hospitals to capture a larger share of the market. In addition the demand for hospital services has been increasing due to the rise in lifestyle related diseases. With a billion plus population the need for healthcare is universal – for both Urban and Rural India. With an increasing incidence of life style diseases (approx. 33 percent of the total pie) and a growing geriatric and pediatric population, there is an emphasis on the need for specialty care

Significant population growth between 1970 - 2000



There has been a significant increase in public infrastructure over the years. While in 1947 the number of hospital beds was 3.2 per 10,000, the present number of 9 per 10,000 is commendable, but still far behind that of other developing countries. The government's share in the healthcare delivery market is only 20 percent. The current NHP aims to increase the government contribution to healthcare to touch 2 percent of the GDP by the end of the five year tenure, an increase from the present contribution of 0.9 percent

Chronic Disease - Medical Definition

Chronic diseases are diseases of long duration and generally slow progression. Chronic diseases, such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes, are by far the leading cause of mortality in the world, representing 63% of all deaths. Out of the 36 million people who died from chronic disease in 2008, nine million were under 60 and ninety per cent of these premature deaths occurred in low- and middle-income countries.

A chronic disease is a disease or other human health condition that is persistent or long-lasting in nature. The term chronic is usually applied when the course of the disease lasts for more than three months. Common chronic diseases include asthma, cancer, diabetes and HIV/AIDS. In medicine, the opposite of chronic is acute. A chronic course is further distinguished from a recurrent course; recurrent diseases relapse repeatedly, with periods of remission in between. While often referred to as "non-communicable diseases", also usually lasting medical conditions, the latter are distinguished by their non-infectious cause. In contrast, some chronic diseases, such as HIV/AIDS, are caused by transmissible infections.

Chronic diseases account for the greatest share of early death and disability worldwide. Recent projections by World Health Organisation (WHO) show that chronic diseases will be the biggest contributor to mortality in low-income countries before 2015 and in terms of disability of life

years (DALYs) before 2030 (Suhrcke et al 2006). The share of chronic conditions is predicted to rise to 65% by 2030 (Mathers and Loncar 2005). The Global Burden of Disease (GBD) project (2005) estimated that, as of 2002, chronic or non-communicable conditions accounted for 54% of deaths in low- and middle-income countries, compared with 36% attributed to communicable (i.e. infectious) diseases, maternal and perinatal conditions and nutritional deficiencies (Suhrcke et al 2006). Chronic diseases, mainly cardiovascular disease, cancer, chronic respiratory diseases, and diabetes, were estimated to cause more than 60% (35 million) of all deaths in 2005; more than 80% of these deaths occurred in low-income and middle-income countries (WHO 2005).

Myths & Realities of Chronic Diseases

Myths	Realities
Chronic diseases mainly affect high income countries	Four out of five chronic disease deaths are in low and middle income countries (LMICs).
LMICs should control i nfectious diseases before chronic diseases	LMICs are at the centre of both old and new public health challenges.
Chronic diseases mainly affect rich people	Both rich and poor are likely to develop chronic diseases, and everywhere are more likely to die as a result.
Chronic diseases primarily affect old people.	Almost half of chronic disease deaths occur prematurely, in people under 70 years of age and one quarter of all chronic disease deaths occur in people under 60 years of age.
Chronic diseases mainly affect men	Chronic diseases, including heart disease, affect women and men almost equally.
Chronic diseases are the result of unhealthy life styles	Individual responsibility can have its full effect only where individuals have equitable access to a healthy life, and are supported to make healthy choices.
Chronic diseases cannot be prevented	The major causes of chronic diseases are known, and if these risk factors were eliminated, at least 80% of all heart disease, stroke and type2 diabetes and more than 40% of cancer would be prevented
Chronic diseases prevention and control is too expensive	A full range of chronic disease interventions are very cost effective for all regions of the world.
"My grandfather smoked and was overweight – and he lived to 96"	In any population, there will be a certain number of people who do not demonstrate the typical patterns seen in the vast majority.
Everyone has to die of something	But death does not need to be slow, painful, or premature

Economic Burden of Chronic Disease

Chronic diseases, such as diabetes and cardiovascular disease, are harmful conditions that require extensive health services and careful long-term medical management.

Worldwide, the cost of chronic diseases and their risk factors – as measured by cost-of-illness studies – is significant and sizeable, ranging from 0.02% to 6.77% of a country's GDP. Chronic

diseases lower household income levels, labour productivity and social mobility, decrease the labour supply and bring forward retirement. They can increase reliance on the state through elevating levels of unemployment, disability and welfare participation. Employers absorb a significant portion of the economic burden of chronic diseases through absenteeism, decreased on-the-job productivity and increased employee turnover. The expense to employers is increased where they carry costs for health insurance, as is often the case in highly developed countries.

The burden of chronic diseases is disproportionately carried by those least able to afford it, thereby increasing the risk of impoverishment for the families concerned. Studies find a significant and robust positive impact on economic growth of working-age chronic disease mortality reductions. Taking into account the impact of chronic disease mortality on economic growth when projecting future national per capita incomes (up to 2025) in five sample countries (Brazil, China, India, Russia and the United States) illustrates the very substantial macroeconomic impact that chronic disease can have. Reducing chronic disease mortality even 1.5% per year would generate a healthy boost to productivity.[1]

Chronic diseases impose not only a major burden on health but also on the economy. Conditions such as diabetes and cardiovascular disease directly impact the economy through high medical costs and indirectly through decreased work productivity. These impacts have far-reaching economic consequences for both developed and developing countries.

WHO projects that over the next 10 years in India[2] :

* Over 60 million people will die from a chronic disease
* Deaths from infectious diseases, maternal and perinatal conditions and nutritional deficiencies combined will decrease 15%
* Deaths from chronic diseases will increase by 18% - mot markedly, death from diabetes will increase by 35%

Economic Impact for Individuals and Families

Chronic diseases create large adverse – and underappreciated – economic effects on families, communities and countries. The widespread belief that chronic diseases are only "diseases of affluence" is incorrect. Chronic diseases can cause individuals and families to fall into poverty, create a downward spiral of worsening poverty and disease, and undermine the macroeconomic development of many countries.
Chronic diseases and poverty are interconnected in a vicious cycle:
In almost all countries, the poorest people are most at risk of developing chronic diseases and dying prematurely from them. Poor people are more vulnerable for several reasons, including greater exposure to risks and decreased access to health services. At the same time, chronic diseases can push many people and their families into poverty, or deepen their poverty and damage the family's long-term economic prospects.[3]

Economic Impact for Countries

New estimates from the World Health Organization indicate that chronic diseases place a grave economic burden on countries, and that this burden will increase if no action is taken to curb the epidemics.

In 2005, the estimated losses in national income from heart disease, stroke and diabetes (reported in international dollars) are $18 billion in China, $11 billion in the Russian Federation, $9 billion in India and $3 billion dollars in Brazil. These losses will accumulate over time. China for example will lose $558 billion over the next 10 years in foregone national income due to heart disease, stroke, and diabetes alone (see figure). But the future is by no means without hope. With increased investment in chronic disease prevention, as outlined in the WHO publication Preventing chronic diseases: a vital investment, it will be possible to prevent 36 million premature deaths over the next 10 years. Some 17 million of these prevented deaths would be in people under 70 years of age. These averted deaths would also translate into substantial gains in countries' economic growth. For example, achievement of the global goal would result in an accumulated economic growth of $36 billion in China, $15 billion in India, and $20 billion in the Russian Federation over the next 10 years.[4]

Making it Happen

Chronic disease prevention and control can no longer be ignored as an important means of poverty reduction, and more generally, economic development. Investment in chronic disease prevention programmes is essential for many low and middle income countries struggling to reduce poverty. There is important work to be done in countries at all stages of development.

Several countries have adapted their Millennium Development Goal targets and indicators to include chronic disease. The WHO stepwise framework, initiated by governments, allows a broad range of sectors to contribute to a unified approach for chronic disease prevention and control

Distribution of Chronic Diseases in India

Several reports and studies have documented the prevalence of chronic diseases in India. (WHO 2004, Registrar General of India 2008, NSSO 2004, Mahal et al 2010)

The WHO (2004) projected that over the next 10 years in India:

1. Over 60 million people will die from chronic diseases.
2. Deaths from infectious diseases, maternal and perinatal conditions, and nutritional deficiencies combined will decrease by 15%.
3. Deaths from chronic diseases will increase by 18%, most markedly; deaths from diabetes will increase by 35%.
4. The total foregone national income (estimated income loss) by 2015 as a result of the impact of heart diseases, stroke and diabetes on labour supplies and savings is estimated to be US $54 billion. Further, the accumulated income losses during the period of 2005 and 2015 will be US $233.6 billion (in 2005 values) for India.

Similarly, the Special Survey of Deaths (SSD), undertaken in 2001-2003 (Registrar General of India, 2008) and which covered over 6,645 small areas (sample units) in all the States and Union Territories found that:

1. Non-communicable diseases are the leading causes of death in the country, constituting 42% of all deaths. Communicable, maternal, perinatal and nutritional conditions constitute another 38% of deaths, injuries and ill-defined causes each constitute 10% of deaths. It is suggested that the majority of ill-defined causes are for older people (70 or higher years) and

most of the ill-defined deaths are likely to be from non-communicable diseases. (Registrar General of India. 2008)

2. Rural areas report more deaths due to communicable, maternal, perinatal and nutritional conditions (41%) compared to urban areas. The proportion of deaths due to non-communicable diseases is less in rural areas (40%) than in the urban areas (56%). Injuries constitute about the same proportion in both rural and urban areas; however, the specific causes of injury vary.

3. The leading cause of death is cardiovascular disease (CVD) (19%), followed by respiratory diseases (9%), diarrhoeal diseases (8%), perinatal conditions (6.3%), respiratory infections such as acute pneumonia (6.2%), tuberculosis (6%), malignant and other neoplasms (5.7%), senility (5.1% of which is concentrated at ages 70 and higher), unintentional injuries: other (4.9%), and symptoms, signs and ill defined conditions (4.8%). Among the age group of 25-69, CVD caused 25% of the total deaths. Furthermore, CVD is the leading cause of death among both males and females.

4. There is a marked regional variation in India in the distribution of leading cause of deaths. For example, the highest proportion of deaths from CVD are in the South (25%) and the lowest in the central regions (12%) of India.

Economic Impacts of Chronic Diseases in India

There exists much evidence to suggest that chronic diseases and related risk factors adversely affect not only individuals and households but also the economy at large through changes in consumption and saving decisions, labour market performance, and human-capital accumulation (Suhrcke et al 2006). Several studies and reports have assessed the economic impacts of chronic diseases in India and found that they impose huge welfare losses for both households and the general economy (Mahal et al 2010, WHO 2004, WHS 2003, Registrar General of India 2008, Shobana et al 2000, 2002, Gupta et al 2006, Popkin et al 2001). In general, three types of methodologies are applied for measuring the economic impact of chronic diseases: they include cost of illness, micro and macro economic impacts.

Cost-of-illness

Cost-of-illness studies measure the economic burden of a disease and estimate the maximum amount that could potentially be saved or gained if a disease were to be eradicated (Segel 2006). The cost of illness (COI) is measured in terms of direct and indirect costs of chronic diseases. Direct costs measure the opportunity cost of resources used for treating a particular illness, whereas indirect costs measure the value of resources lost due to a particular illness. (Kirschstein 2005).

Direct medical costs include costs incurred during hospitalisation or as outpatient e.g. emergency department care, nursing home care, hospice care, rehabilitation care, specialists' and other health professionals' care, diagnostic tests, prescription drugs and drug sundries, and medical supplies. Nonmedical direct costs include transportation costs to health care providers; relocation expenses; and costs of making changes to one's diet, house, car, or related items (Hodgson and Meiners, 1982, Kirschstein, 2005, Rice 1999, Segel 2006). When measuring direct costs, studies often measure total direct costs (i.e. the costs of resources used) rather than net direct costs,

which subtracts future medical costs avoided because of the death of a patient, from total costs (Hodgson and Meiners, 1982).

Indirect costs include the loss of resources due to morbidity and mortality, which inherently place a monetary value on the value of life. (Kirschstein, 2005, Mart et al 2001) Indirect costs represent the other portion of estimated costs. There are three primary approaches to estimate indirect costs: the human capital method, the friction cost method, and the willingness to pay method.

1. The human capital method measures the lost production, in terms of lost earnings, of a patient or caregiver. (Hodgson and Meiners 1982, Hodgson 1983, Rice 1967) For mortality or permanent disability costs, the approach multiplies the earnings lost at each age by the probability of living to that age.

2. The friction cost method, measures only the production losses during the time it takes to replace a worker (Koopmanschap 1992, Koopmanschap et al. 1995, Johannesson and Karlsson, 1996). This approach assumes that short-term work losses can be made up by an employee and the loss of an employee only results in costs in the time it takes for a new employee to be hired and trained, known as the friction period.

3. The willingness to pay approach measures the amount an individual would pay to reduce the probability of illness or mortality (Segel. 2006, Hodgson. 1983). The methods to determine an individual's willingness to pay includes surveys, an examination of additional wages for employment with high risks, an examination of the demand for products that lead to greater health or safety. (Rice et al. 1989, Hirth et al. 2000).

The Indian Scenario

There are a number of Indian studies, which have estimated the direct and indirect cost of specific chronic diseases. For example, Shobhana et al (2000) calculated the costs of diabetes among the sample population of Chennai and found that out-of-pocket-spending due to diabetes during hospitalization was INR 5,300 per event. Further, Murthy and Sastry (2005a) estimated that the direct and indirect costs of treatment of COPD in Hyderabad district of Andhra Pradesh found that treatment costs for a patient with severe COPD was nearly INR 33,000 in 2001. Apart from these, the annual income losses to households affected by CVDs in India in 2004 were 144-158 billion INR, which occupied more than one-third of all income losses out of all chronic diseases. (Mahal et al 2010) [5]

Microeconomic consequences of chronic disease

This methodology measures the effects of chronic diseases on consumption and saving. (Suhrcke et al 2006). Consumption, savings and investments can be affected by the disease condition itself, as well as by the behaviours that give rise to the disease. (Suhrcke et al 2006) Chronic diseases and related risk factors may affect labour productivity and labour supply, which have important consequences for individuals and households. (Suhrcke et al 2006)

A concept that has been increasingly applied in the literature is that of 'catastrophic expenditures' for health care, sometimes also called 'impoverishing medical expenditures'. Expenditures for medical care are defined as financially catastrophic when they endanger a household's ability to maintain its customary standard of living. Catastrophic expenditures are not always

synonymous with high healthcare costs. (Xu et al. 2003, Doorslaer et al. 2006) A large bill for surgery, for example, might not be catastrophic if a household does not bear the full cost because the service is provided free or at a subsidised price, or is covered by third-party insurance (Wyszewianski 1986). Even small costs for common illnesses can be financially catastrophic for poor households with no insurance cover. (Xu et al.2003) The threshold at which a level of expenditure becomes financially catastrophic relative to a household's 'capacity to pay' (the income that remains after basic consumption needs have been met) has typically been set between 5% and 20% of total household income. (Wyszewianski 1986, Berki SE 1986).
Using a threshold of 40% of capacity to pay Xu et al. 2003 found that the share of households with catastrophic health expenditures in 59 developed and developing countries varied between 0.01% (France) and 10.45% (Vietnam). As expected, the risk of catastrophic expenditures in any given country increases with the share of total health spending that is paid out of pocket.

Macroeconomic consequences of chronic disease

Health in general, measured as life expectancy or adult mortality, is considered to be a robust and strong predictor of economic growth (Barro 1991, 1996; Barro and Lee 1994; Barro 1995; Sachs and Warner 1995). Since chronic disease constitutes a major part of the global health burden and accounts for a major part of reduced life expectancy and adult mortality, it would be expected to have a negative impact upon economic growth.

The WHO (2004) estimated that the estimated losses in national income in 2005 from CVD and diabetes would be US$ 9 billion for India. However the actual loss in GDP due to chronic conditions was US$1.35 billion in 2006 and it is estimated to be amount cumulatively to a total of US$17 billion by the year 2015. (Abegunde et al. 2007)

Chronic diseases, especially CVD, Diabetes, Cancer imposes considerable financial burden through out of pocket spending, reduction in consumption and saving, and loss of national income. For example, the cost of diabetes is about 2.1 percent of GDP (The Economist Intelligence Unit, 2007). Further, evidences suggest that the economic cost due to CVD could amount to as much as 20 percent of its state domestic product in Kerala(Gupta et al. 2006) and CVD-related losses of US $30 billion per year is occurring in the country (Leeder et al. 2004).

More recent evidence has estimated that the total income losses due to chronic diseases in India to be between US$1,094 - 1,113 billion. (Table 5) Of this, loss due to hypertension was the highest, i.e. US$ 199 billion and the next CVD with an income loss of US$144-158 billion.

Table 4: Economic Impacts of CVD, Diabetes and Cancer[1]

Study	Diseases	Study sample and methods	Impact
Mahal et al. 2010 India	All major chronic diseases and specifically for CVD and Cancer	Based on NSSO data 2004 and data from Registrar General India.	The odds of incurring catastrophic hospitalization expenditures are nearly 160 percent higher with cancer and 30 percent greater with CVD as compared to communicable conditions that result in hospital stays. **CVD:** Though additional health care expenses due to CVD (in current INR) more than doubled over the period from 1995-96 to 2004, and inpatient lengths of stay declined. The impacts on catastrophic spending appear not to have changed much over the two periods.In contrast, the average treatment effect of CVD on poverty increased quite sharply from 1995-96 to 2004, despite rising incomes and lowered overall poverty rates. **Cancer:** individuals with cancer report greater use of health services, higher levels of out of pocket health spending and greater rates of catastrophic spending and impoverishment in their households in comparison to those who do not report cancer.

Leeder et al. 2004 India	CVD	WHO burden of disease data on DALYs loston account of CVD, in conjunction with an estimate of US$1,000 per DALY lost.	CVD-related losses of US $30 billion per year
Popkin et al. 2001 India	CVD, Diabetes and Cancer	Combined costs of healthcare as well as lost incomes from ill-health for cancers, diabetes and CVD using a mix of data from the 1995-96 health care utilization and expenditure survey of the NSSO.	Healthcare costs (both out-of-pocket and government spending) associated with just these three conditions amounted to US$13.9 billion in 1995-96, or about 0.4 percent of GDP. The estimated lost incomes due to these three disease in 1995-96 are roughly US$2.25 billion.
Abegunde et al. 2007 India	CVD, diabetes, cancers and respiratory conditions	Impact of CVD, diabetes, cancers and respiratory conditions on current and future national output. Compared GDP levels under business-as-usual scenarios with GDP levels that could be achieved if deaths from chronic disease were to be eliminated completely. Data source: mortality (by cause) statistics from the Registrar General of India and projections made by Mathers and Loncar (2006).	Found that the loss in GDP due to chronic conditions to be of the order of US$1.35 billion in 2006 and amounting cumulatively to a total of US$17 billion by the year 2015.
Gupta et al. 2006 Kerala, India	CVD	Primary data among urban workers in a firm in Kerala	Economic cost could amount to as much as 20 percent of its state domestic product. Further, 25 percent of all deaths in the 25-70 year age group to be due to CVD
The Economist Intelligence Unit (EIU) 2007, India	Diabetes	Estimated the economic costs by assessing direct medical care costs, lost productivity as a result of mortality, morbidity and disability associated with diabetes.	The costs for India are about 2.1 percent of GDP.
Shobhana et al 2000 Chennai-Tamil	Diabetes	Out-of-pocket spending by a sample of about 600 diabetic in-patients in hospitals.	Average expenditure during hospitalization is INR 5,300. Diabetic patients with a longer history of diabetes (5 years or more) spent 70 percent more

The prevalence of chronic diseases is increasing not only worldwide but also in India. The myths that chronic diseases only affect the rich and elderly have been dispelled by the empirical evidence that it also affects the poor and young in India. Furthermore, chronic diseases incur huge welfare losses, both at the individual and national level; through cost of illness, reduction in consumption and impoverishment and loss of national production. Thus, chronic diseases have considerable impact on the national economy level which merits policy attention.

With regard to the available evidence, there remain gaps in research on the burden and cost of chronic diseases in India. The evidence is largely based on studies with small sample size and without the application of rigorous methodology. The applications of randomized control trial methods on measuring the impacts of chronic diseases would give more robust results. Furthermore, there is limited documented evidence on how individuals and households cope and smooth their consumption and saving when they are affected with chronic diseases. The existing research evidence suggests that chronic diseases affect households adversely and leads to impoverishment. However, the robustness of these findings may be doubtful.

To date, in India, routine and complete data on chronic disease is not formally collected. Though there is research evidence on the impact of single risk factors on morbidity as well as the economic impact of single illness on households and national economies, there is little information on the impacts of co-risk factors and co-morbidities. There is also a dearth of evidence on the cost effectiveness of various interventions to reduce the burden of chronic illness in India. Since resources are limited but have multiple uses and prevalence of chronic diseases are increasing, it is necessary to consider the need for rigorous cost effective and cost benefit studies in this regard to assist the policy makers and other stakeholders to make context specific and effective interventions to reduce the burden of chronic diseases.

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