Non-Communicable Diseases (NCDs)

The Problem

India is currently undergoing an epidemiological transition, with rising morbidity and mortality due to non-communicable diseases (NCDs). The WHO (2014), based on Global Status Report on NCDs data, reported that NCDs account for more than 5.87 million or about 60% of all deaths in India. This is confirmed by the Global Burden of Disease study (2016), which found that Disability Adjusted Life Years (DALYs) due to NCDs have gradually exceeded those due to communicable, maternal, neonatal and nutritional diseases since 2003. It is estimated that NCDs and mental health conditions will cost India $4.58 trillion between 2012 and 2030, with CVDs alone contributing about $2.17 trillion (Bloom et al 2014).

With respect to Rajasthan self-reported morbidity increased significantly between three rounds of the National Sample Survey (1995, 2004 and 2014): (i) for cardiovascular diseases (CVDs), self-reporting doubled from 1 to 2 cases per 1000 population; and (ii) for all NCDs combined, self-reporting went up from 3 to 20 cases per 1000 population (Paul and Singh 2017). Despite the implementation of the National Program for the Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS), data show that coverage of some of the key interventions continues to be low. For example, less than 20% of women have undergone any examination of the cervix, and less than 5% have undergone a breast exam, reflecting a combination of lower capacity within the system as well as low levels of awareness at the community level.

There is a need to re-orient the approach more towards early detection, resulting in lowered treatment costs and improved treatment outcomes, through population-based NCD screening and treatment programs to achieve the objective of Universal Health Coverage of Government of India.

For all the interventions discussed it is assumed that all of them will be delivered through the existing primary health care network but located at the Primary Health Center (PHC) rather than the Sub-center as in the current National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) design. All interventions will cover the individuals in the age group of 30-69 years. Available community level resources can be leveraged for information dissemination and mobilization of target groups. Targets for screening and treatment coverage should be monitored stringently.

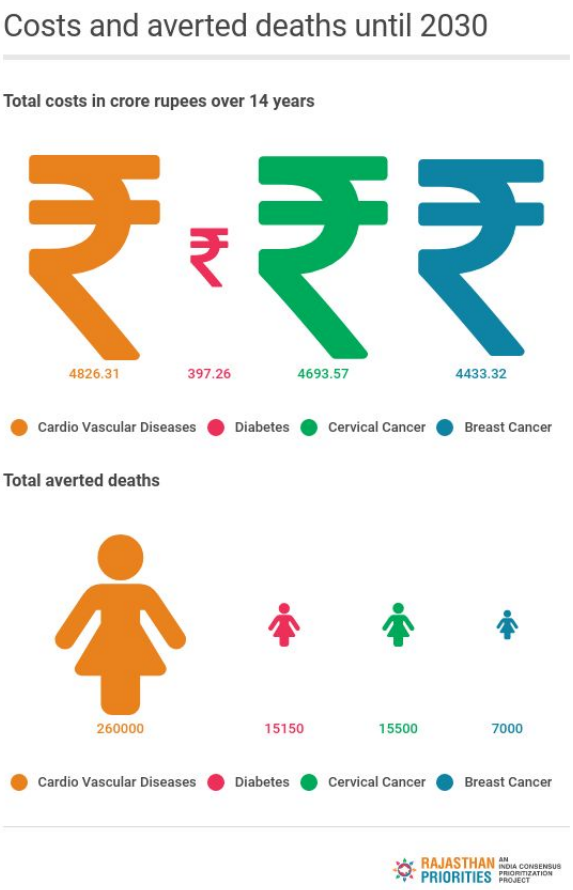
Costs for all the 4 interventions is a sum of treatment costs, private costs and opportunity costs. Benefits for all the four interventions are estimated based on the number of deaths averted by the selected intervention, the estimated number of years of life saved, multiplied by the value of one YLL.

Solutions

Interventions	BCR	Benefit (INR crores)	Cost (INR crores)
Cardiovascular Diseases	23.2	111885.72	4826.31
Diabetes	16.2	6420.78	397.26
Cervical Cancer	1.4	6523.33	4693.57
Breast Cancer	0.7	2925.28	4433.32

Total costs and benefits are discounted at 5%

The full paper by Professor **Shreelata Rao Seshadri** of Azim Premji University with **Vijayalakshmi Hebbare** of Center for Global Health Research is available on www.rajasthanpriorities.com/health-non-communicable-diseases.



Secondary Prevention of CVD through use of a multidrug polypill

The Problem

Analysis of mortality data by the Registrar General of India (RGI) in 2010-13 shows that mortality due to CVD constitutes 23% of all deaths and 32% of adult deaths during that period (Gupta et al 2016). The Global Burden of Disease database estimates the absolute number of people dying in India due to CVD was 1.13 million in 2010, and the proportion of Years of Life Lost (YLL) due to CVD was 9.8% (IHME 2017). Projections to 2030 predict an alarming rise in CVD deaths, accounting for 35.9% of all deaths, and 52% of all NCD associated deaths (Reddy and Mohan 2014). The same study estimates that about 2.7 million people die of CVD annually currently; this is projected to increase to 4.2 million by 2030. It is estimated that CVDs will cost India $2.17 trillion between 2012 and 2030 (Bloom et al 2014). Global Burden of Disease (2017) estimates that, in the age group 30-69, CVD causes 333.5/100000 deaths and YLDs at 247/100000 for Rajasthan, about 20% of which could be averted with the suggested regimen.

The Solution

The intervention seeks to implement a screening program to identify those at high risk of CVD; and then put those with elevated blood pressure on a polypill. High risk patients can be relatively easily identified either because they have already accessed health services, or through simple screening for common risk factors (tobacco use, blood pressure, weight, age and sex) at the primary care level. The target population for this intervention are people aged between 30-69 years assessed as being at high risk and those with existing cardiovascular disease. The target would be to screen 70% of this population with the assumption of achieving 60% adherence to treatment. The WHO has prepared guidelines for secondary prevention in resource-limited environments which generally include the use of four medications: aspirin, ACE-inhibitors, beta blockers and statins, which can be combined in a 'polypill'.

Costs

Average cost per treated individual is estimated at Rs. 4,202 for males and Rs. 4,106 for females.

Benefits

Between 2018-2030, 240 million individuals would be screened and 14 million would be treated. Projected CVD deaths averted due to secondary prevention are 0.26 million.

Diabetes screening and treatment with Metformin therapy

The Problem

Diabetes causes about 30/100,000 deaths in Rajasthan, about 40% of which could be averted by early detection and treatment with Metformin. Metformin is a well-recognized cost-effective treatment for pre-diabetes and diabetes, resulting in avoidance of diabetes in about 30% of high risk individuals.

The Solution

The intervention seeks to screen individuals for diabetes and those identified with elevated blood sugar will be put on a regimen of 850 mg Metformin twice a day. The target population for this intervention are people aged between 30-69 years with the aim of 50% coverage of the target group

annually, and the assumption of achieving 65% adherence to treatment.

Costs

Average cost per treated individual is estimated at Rs. 2,197 for males and Rs. 2,101 for females (Based on estimates of treatment costs, private costs and opportunity cost).

Benefits

It is estimated that 40% of the deaths can be averted over a 13-year period with Metformin therapy. Assuming 65 % adherence to Metformin therapy about 15,150 projected diabetes deaths could be prevented in Rajasthan. Between 2018-2030, 30-69-year-old about 170 million individuals would be screened and 7.2 million would be treated.

Cervical cancer screening and treatment through VIA/VILI screening (one time)

The Problem

About 1,32,000 new cases of cancer cervix are detected in India every year, constituting one quarter of the global burden; and 200 women are estimated to die of cervical cancer every day (Ray and Varghese 2016). Cervical cancer causes about 11/100,000 deaths in Rajasthan, of which about 35% could be averted by screening and early detection. Less than 20% of women in Rajasthan have undergone any examination of the cervix.

The Solution

The intervention seeks screening of women in the age group of 30-69 years for cervical cancer. The aim is to cover 30% of women in the target group annually for the first 3-4 years and covering the cohort of women entering the 30-year age group thereafter. The intervention would also cover cryosurgery where appropriate. About 8% women in Rajasthan are likely to have cervical lesions, which require cryosurgery.

Costs

Average cost per screened individual for screening is INR 2,960 and for Cryosurgery it is 2,333.

Benefits

Between 2018-2030 Number of women (30-69 years) who would be screened are 18 million and 1.1 million women would be treated. Projected cervical Cancer deaths averted between 2018-2030 is estimated to be 15,500.

Breast Cancer Screening through biennial clinical Breast Exam (CBE)

The Problem

Breast cancer causes about 16/100,000 deaths in Rajasthan, of which 16% could be averted by early detection through CBE. Routine screening has been initiated however, less than 5% have undergone a breast exam in Rajasthan. It is estimated that a 28-65% reduction in mortality due to breast cancer can be attributed to early detection (Berry et al 2005).

The Solution

The intervention seeks breast cancer screening. The target group for this intervention are women in the age group of 30-69 years and the aim is to cover 50% of women in the target age group each year and eventually achieving 100% coverage of all women in this age group.

Costs

Average cost per person screened is INR 697.

Benefits

Number of women who would benefit from CBE are 84.5 million. Projected breast cancer deaths averted due to this intervention stands at 7,000.