Cardiovascular risk in India – implications for health insurance

Dr Detloff Rump, Chief Underwriter Asia
Agenda

• Some statistics to set the scene
• General cost aspects of CVD
• Diagnostics and treatment
• Economic/societal burden of CVD in India
• Bridging the gap
Some statistics to set the scene
Rapid pace of improvements in life expectancy
1970 compared with 2010

Figure 8: Mean age of death in Global Burden of Disease regions in 1970 compared with 2010

Source: Global Burden of Disease 2010
Causes of death vary by country

Cancer
Cardiovascular (CVD)
Chronic respiratory
Neurological
Diabetes
Injuries

Accessed March 2015
Contribution of death in India by cardiovascular disease has significantly increased

Source: GBD Cause Patterns. University of Washington
Risk factor contribution to mortality varies by country

Attributable deaths per 100,000

- Dietary risks
- High blood pressure
- High glucose
- Smoking

Source: GBD Cause Patterns. University of Washington
Different standards of care lead to different mortality outcomes as shown in myocardial infarction death rates

Standardized myocardial infarction death rate per 100,000 persons 1980-2006

source: OECD data
Projected increase of death due to NCDs will raise from 54% today to 67% by 2030

Source: S. Reddy, S. Mohan; RDS Health Risk Factors India; Swiss Re
With 65 million diabetics India is often referred to as the ‘diabetes capital’ of the world

Chronic diseases in India: Burden and implications
K. Srinath Reddy and Sailesh Mohan (Public Health Foundation of India)

• India is on the cusp of health change

• It has both extensive recent urbanisation; with continuing widespread near-subsistence agriculture in basic conditions

• Infectious disease is still a serious public health concern; but the spread of NCDs is rapid

• Diabetes is spreading so rapidly that India that it is projected to increase to 109 million diabetics by 2035
High blood pressure followed by high blood glucose are the two chief NCD risk factors in India

Source: S. Reddy, S. Mohan; RDS Health Risk Factors India; Swiss Re
India's nutrition transition is shadowed by a sudden steep increase in type 2 diabetics

The nutrition transition in India: Trends in dietary intake and associations with cardiometabolic outcomes
Shilpa Bupathiraju (Harvard T.H. Chan School of Public Health)

The spread of type 2 diabetes in India has mainly been related to changes in diet

- In the last five decades, the production of sugar among Indians has risen from less than 3% to 20% of sugar produced globally
- Urban participants reporting up to 35% higher sugar intake than their rural counterparts
- High glycaemic index and glycaemic load diets are associated with a 19% and 13% higher risk, respectively of type 2 diabetes
- High intakes of dietary fiber are associated with a 69% lower odds ratio of type 2 diabetes
- Substituting one serving of whole grains with potatoes is associated with a 30% higher risk for type 2 diabetes
Supply of coarse cereals has declined drastically while consumption of milled rice has significantly increased.

Source: Shilpa Bupathiraju; RDS Health Risk Factors India; Swiss Re
Shift from the fresh market to processed potato products lead to high glycaemic index and glycaemic load exposure

Source: Shilpa Bupathiraju; RDS Health Risk Factors India; Swiss Re
Sugar consumption has significantly increased through consumption of sweets, baked goods, candies, ice cream and soft drinks.

Source: Shilpa Bupathiraju; RDS Health Risk Factors India; Swiss Re
Supply of vegetable oils has nearly doubled while those of animal fats have increased threefold

Trans fatty acid content in unbranded butter was 18.9% which exceeded the prescribed Denmark limit by 9.5-fold

Source: Shilpa Bupathiraju; RDS Health Risk Factors India; Swiss Re
Mortality from CVD-causes is greater among higher socioeconomic groups

Socioeconomic Inequalities in the Prevalence of Cardiovascular Disease and Risk Factors in India
Daniel J. Corsi, Subu Subramanian (Harvard T.H. Chan School of Public Health)

Prevalence of conventional cardiovascular risk factors (CVRF), including elevated blood pressure, cholesterol, diabetes and obesity, are greater among the most socially advantaged groups in Indian society.

- The adjusted prevalence of bidi smoking decreased with increasing categories of household wealth, while cigarette smoking increased
- The proportion of CVD-related deaths was 30.5% of all deaths in the “lower education groups” versus 34.4% in the “high education groups”
- Diabetes prevalence was 4.3% among those with no education compared to 10.2% among those with 10+ years of education
Risk of obesity is far higher among city dwellers than rural residents

Urbanisation in China and India: Impact on Cardiovascular Risk Factors
Nancy Long Sieber (Harvard T.H. Chan School of Public Health)

The lifestyle changes that occur as people become urbanised, including increasing consumption of high calorie processed foods, exposure to higher levels of ambient air pollution, and fewer opportunities for physical activity, can translate into a greater risk of obesity, diabetes, and cardiovascular disease.

• About 49'000 urban slums exist housing 65 million people

• Delhi has the world’s highest air pollution level of PM$_{2.5}$ at 153 $\mu$g/m$^3$

• Chain restaurants accounted for USD 2.5 billion in revenue in 2013, and are expected to earn USD 8 billion by 2020
General cost aspects of CVD
...just to remind us...the burden of non-communicable disease is on the rise

• ‘According to current estimates, India will soon have the highest number of cases of cardiovascular disease in the world,’ says Dr Nikhil Kumar, Director, Cardiology, Fortis Memorial Research Institute, Gurgaon. It is estimated to account for 35.9% deaths by the year 2030.

• Heart disease has escalated among the younger generation with a significant risk in both males and females. ‘More and more number of young Indians are suffering from coronary artery disease, owing to their poor lifestyle, and if this continues the future looks even more dangerous,’ says Dr Kumar. ‘Five years ago, we hardly saw young patients with heart problems. Now, we get many cases where people in the 25-35 age group are diagnosed with heart disease’ said Dr Ajay Chaurasia, head of cardiology department, BYL Nair Hospital stated in the Saffola Life study.

• The risk of heart disease is highest in urban population: A 2013 study conducted by Saffola Life concluded that over 70 per cent of the urban Indian population is at the risk of being diagnosed with heart disease. This is mainly due to unhealthy eating habits, lack of physical activity and stress.

• Coronary heart disease is mainly responsible for heart disease deaths. By 2020, about one third of all deaths will be caused due to CHD.
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The Costs of disease are staggering. Death rates alone cannot describe the burden of heart disease and stroke. In 2010, the total costs of cardiovascular diseases in the United States were estimated to be $444 billion. Treatment of these diseases accounts for about $1 of every $6 spent on health care in this country.

www.cdc.gov/chronicdisease/resources/publications/AAG/dhdsp.htm
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www.cdc.gov/chronicdisease/resources/publications/AAG/dhdsp.htm
It is essential to make the investment required to deliver better CVD primary prevention

Will Lessons Learned from the West During the Epidemic of Cardiovascular Disease Translate into Better Cardiovascular Disease Outcomes in Developing Countries?

Brian Ivanovic (Swiss Re)

- CVD deaths in India are over 680 per 100'000 for men and 420 per 100 000 in women, which is twice those observed in the US
- As recently as 2010, the economic costs of CVD are estimated to be over USD 440 billion in the US
- CVD prevention include health care financing and insurance availability, tobacco control and promotion of physical activity
- It is far more cost effective to reduce CVD incidence than to treat emerged disease
Diagnosis, treatment and associated costs
Diagnostic tests

- ECG, Exercise ECG
- Angiography
- Echocardiography
- CardioCT (incl. Calcium Score)
- Perfusion scan
- MRI
- Blood test: troponins
Treatment of CHD

• Acute (acute coronary syndrome):
  – Thrombolysis
  – Angioplasty/Stenting
  – CABG

• Long term (with or without ACS):
  – Risk factor control
  – Vasodilators/Beta-blockers/Antiarrhythmica...
  – Angioplasty/Stenting/CABG
  – ? Stem cell therapy
Just to get a feel: Cost of CAD in the US

In 2008, total costs associated with coronary artery disease (CAD) were $156.4 billion, up from $129.9 billion in 2003. Source: American Heart Association. Heart Disease and Stroke Statistics—2008 Update.
Just to get a feel: US medical insurance

Why Hearts Matter

In an analysis of insurance claims of about 4 million individuals from large U.S. companies, annual average payments for heart related claims were $4,639 per patient, more than double the average payment of $2,230 for all conditions examined!

In India we have a bit of a peculiar situation

• High class facilities (interventions)
• May distract from focus on lifestyle changes and medication to large parts of population
Total coronary interventions in India

http://www.neeman-medical.com
Total number of stents and drug eluting stents (DES) usage patterns in India are increasing.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Stents</th>
<th>DES</th>
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<tbody>
<tr>
<td>2002</td>
<td>32686</td>
<td>1715</td>
</tr>
<tr>
<td>2003</td>
<td>34520</td>
<td>8450</td>
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<tr>
<td>2004</td>
<td>40,000</td>
<td>19000</td>
</tr>
<tr>
<td>2005</td>
<td>50980</td>
<td>28199</td>
</tr>
<tr>
<td>2006</td>
<td>56015</td>
<td>40397</td>
</tr>
<tr>
<td>2007</td>
<td>70114</td>
<td>40607</td>
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</tbody>
</table>

http://www.neeman-medical.com
Interventions in acute MI are on the rise
Households experienced significant OOP expenditures primarily for medication (65%) and dietary modification (22%) even while accessing public health facility. Also, 30% of the households experienced catastrophic expenditures* without hospitalization. Conclusion: Efforts should be made to lower the cost of drugs and diagnostics like angiography. Lifestyle modification programs would also help to bring down costs.

* Catastrophic: >40% of a household capacity to pay
Various financial coping mechanisms adopted by the households [N=138]

<table>
<thead>
<tr>
<th>Coping Mechanism</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings</td>
<td>89 (65%)</td>
</tr>
<tr>
<td>Insurance</td>
<td>47 (34%)</td>
</tr>
<tr>
<td>Loan</td>
<td>2 (1%)</td>
</tr>
<tr>
<td>Sale of assets</td>
<td>0 (0%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>138 (100%)</strong></td>
</tr>
</tbody>
</table>
Economic/societal burden of CVD in India
Attention young India, take care of your heart

Dr. A. Kader Sahib Ashraf

A few decades ago the obvious cause for a broken heart in a young individual was romance and love. But with the epidemic of coronary artery disease (CAD) hitting India hard, the scenario is changing rapidly and with it, the meaning and cause of a ‘broken young heart’. CAD refers to disease of the coronary arteries. Coronary
Number of people (in millions) worldwide that lose productive years due to CVD.

**YEARS OF LIFE LOST DUE TO CVD IN POPULATIONS**

Aged 35-64 Years

- India: 17.9
- China: 10.5
- Russia: 6.7
- USA: 3.3
- S. Africa: 0.3
- Portugal: 0.04


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Economic Burden of CHD in India

• India is estimated to have lost 8.7 billion 1998 international dollars in 2005 because of CHD, stroke, and diabetes. These estimates increase to 54 billion 1998 international dollars by 2015.

• India’s growth of gross domestic product (GDP) is estimated to fall by 1% because of the combined economic impact of CHD, stroke, and diabetes. (WHO, 2005)

• A 2000 estimate of 9.2 million productive years of lives lost in Indian adults secondary to overall CVD contributes to this economic decline. As CHD (and CVD) rates increase, this estimate increases to 17.9 million by 2030. (Leeder et al., 2004). This is ten times more than in the US!
Disability adjusted life years lost due to cardiovascular disease: By population in millions and year

Coelho KR. Significance of the development of a cardiovascular disease surveillance and reporting system in India. Indian J Palliat Care 2013;19:131-8
Cardiovascular disease has been a key contributor to increases in years of life lost (YLLs) in India.

<table>
<thead>
<tr>
<th>Rank and disorder 1990</th>
<th>1990 YLLs in thousands (% of total)</th>
<th>Rank and disorder 2010</th>
<th>2010 YLLs in thousands (% of total)</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrheal diseases</td>
<td>57,828 (12.4%)</td>
<td>Preterm birth complications</td>
<td>27,808 (7.4%)</td>
<td>-31</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>47,806 (10.3%)</td>
<td>Lower respiratory infections</td>
<td>26,127 (6.9%)</td>
<td>-45</td>
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<tr>
<td>Preterm birth complications</td>
<td>40,134 (8.6%)</td>
<td>Diarrheal diseases</td>
<td>25,589 (6.8%)</td>
<td>-56</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>20,533 (4.4%)</td>
<td>Ischemic heart disease</td>
<td>25,253 (6.7%)</td>
<td>66</td>
</tr>
<tr>
<td>Neonatal sepsis</td>
<td>21,336 (4.6%)</td>
<td>COPD</td>
<td>17,761 (4.7%)</td>
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<tr>
<td>Protein-energy malnutrition</td>
<td>18,808 (4.1%)</td>
<td>Neonatal sepsis</td>
<td>16,594 (4.4%)</td>
<td>-23</td>
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<tr>
<td>COPD</td>
<td>17,426 (3.8%)</td>
<td>Tuberculosis</td>
<td>13,732 (3.6%)</td>
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<tr>
<td>Ischemic heart disease</td>
<td>15,294 (3.3%)</td>
<td>Self-harm</td>
<td>12,981 (3.4%)</td>
<td>154</td>
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<tr>
<td>Neonatal encephalopathy</td>
<td>13,328 (2.9%)</td>
<td>Road injury</td>
<td>12,588 (3.3%)</td>
<td>63</td>
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<tr>
<td>Measles</td>
<td>16,651 (3.5%)</td>
<td>Stroke</td>
<td>11,726 (3.1%)</td>
<td>54</td>
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<tr>
<td>Meningitis</td>
<td>9,317 (2.0%)</td>
<td>Neonatal encephalopathy</td>
<td>11,099 (2.9%)</td>
<td>-17</td>
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<tr>
<td>Measles</td>
<td>9,031 (1.9%)</td>
<td>HIV/AIDS</td>
<td>8,698 (2.3%)</td>
<td>1,147</td>
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<tr>
<td>Stroke</td>
<td>7,904 (1.7%)</td>
<td>Fire</td>
<td>8,172 (2.2%)</td>
<td>19</td>
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<tr>
<td>Maternal disorders</td>
<td>7,923 (1.7%)</td>
<td>Congenital anomalies</td>
<td>7,073 (1.9%)</td>
<td>4</td>
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<tr>
<td>Road injury</td>
<td>7,399 (1.6%)</td>
<td>Protein-energy malnutrition</td>
<td>6,528 (1.7%)</td>
<td>-36</td>
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<tr>
<td>Malaria</td>
<td>7,057 (1.5%)</td>
<td>Cirrhosis</td>
<td>6,134 (1.6%)</td>
<td>84</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>6,949 (1.6%)</td>
<td>Meningitis</td>
<td>5,790 (1.5%)</td>
<td>-38</td>
</tr>
<tr>
<td>Fire</td>
<td>6,694 (1.4%)</td>
<td>Diabetes</td>
<td>5,056 (1.3%)</td>
<td>92</td>
</tr>
<tr>
<td>Encephalitis</td>
<td>3,448 (1.4%)</td>
<td>Measles</td>
<td>5,881 (1.5%)</td>
<td>-63</td>
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<tr>
<td>Self-harm</td>
<td>5,669 (1.2%)</td>
<td>Drowning</td>
<td>4,717 (1.2%)</td>
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<td>4,578 (1.0%)</td>
<td>Encephalitis</td>
<td>4,214 (1.1%)</td>
<td>-35</td>
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<tr>
<td>Peptic ulcer</td>
<td>2,082 (0.9%)</td>
<td>Falls</td>
<td>4,281 (1.1%)</td>
<td>15</td>
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<tr>
<td>Syphilis</td>
<td>3,873 (0.8%)</td>
<td>Typhoid fevers</td>
<td>4,336 (1.1%)</td>
<td>34</td>
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<td>Asthma</td>
<td>3,911 (0.8%)</td>
<td>Asthma</td>
<td>3,130 (0.8%)</td>
<td>-20</td>
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<tr>
<td>Mechanical forces</td>
<td>3,849 (0.8%)</td>
<td>Cirrhosis</td>
<td>3,180 (0.8%)</td>
<td>-22</td>
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<td>Typhoid fevers</td>
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- Ischemic heart disease +66%
- Stroke +54%
- Diabetes +92%
Only around 25% of the population have access to health care services

- 16.7% of the Indian population had health insurance in 2012
- Still 75–80% of health care spending is currently directly out of pocket
- NCDs currently account for 53% of the total deaths with projections indicating a further increase to 67% by 2030
...so far, we have to acknowledge....

• CVD, in particular CAD, presents a massive challenge
  – to the affected individual and his family
  – to the Indian economy

• ...and there is a very considerable protection gap

...so what should we as insurers do?
Bridging the gap
How can we bridge the gap?

• Educate
• Convince young people to acknowledge the risk
• Market the best products
• Find better ways of insuring people at risk
• Keep price at affordable level
• Control claims
• Invest in prevention
• .........
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