

# 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

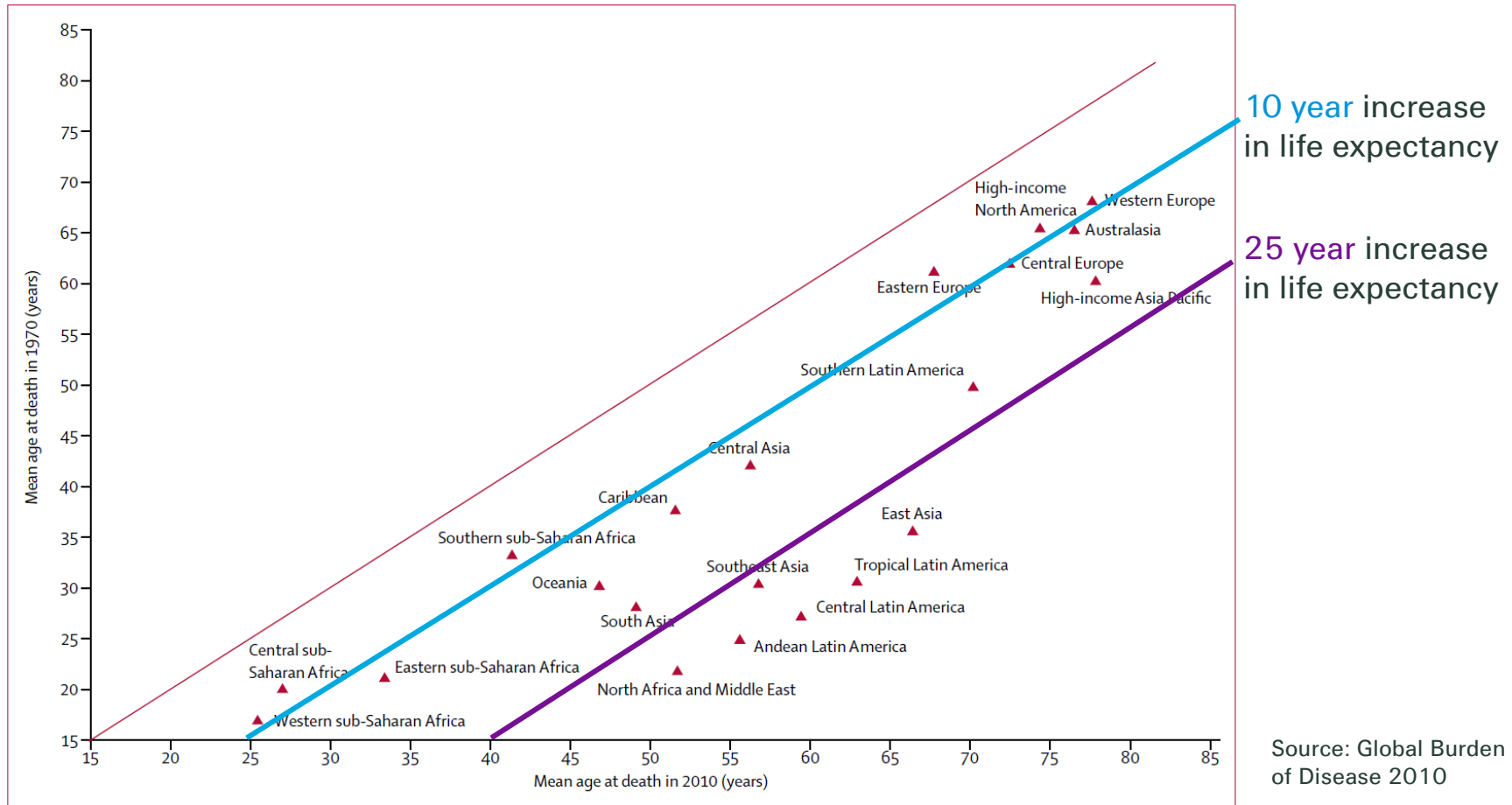
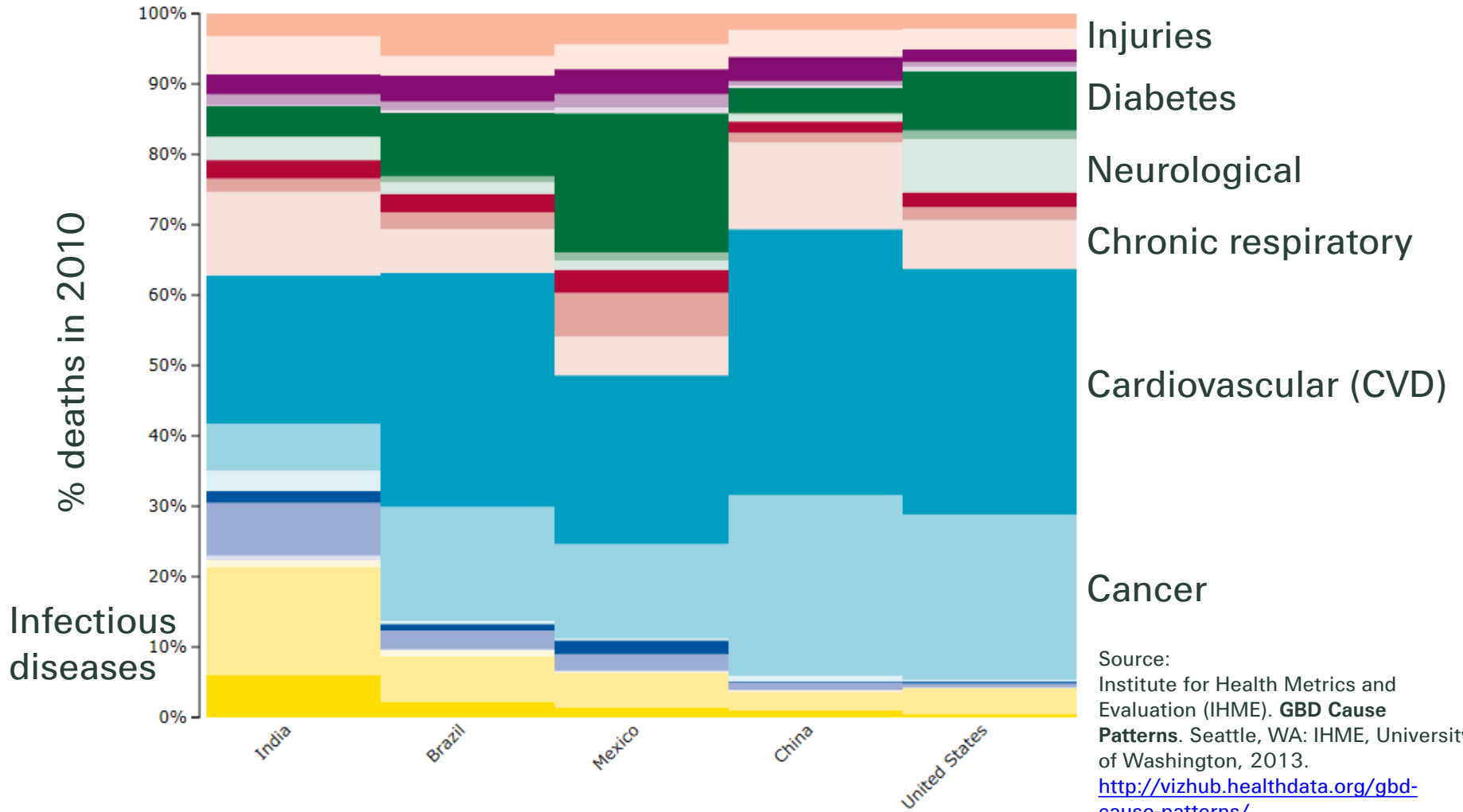


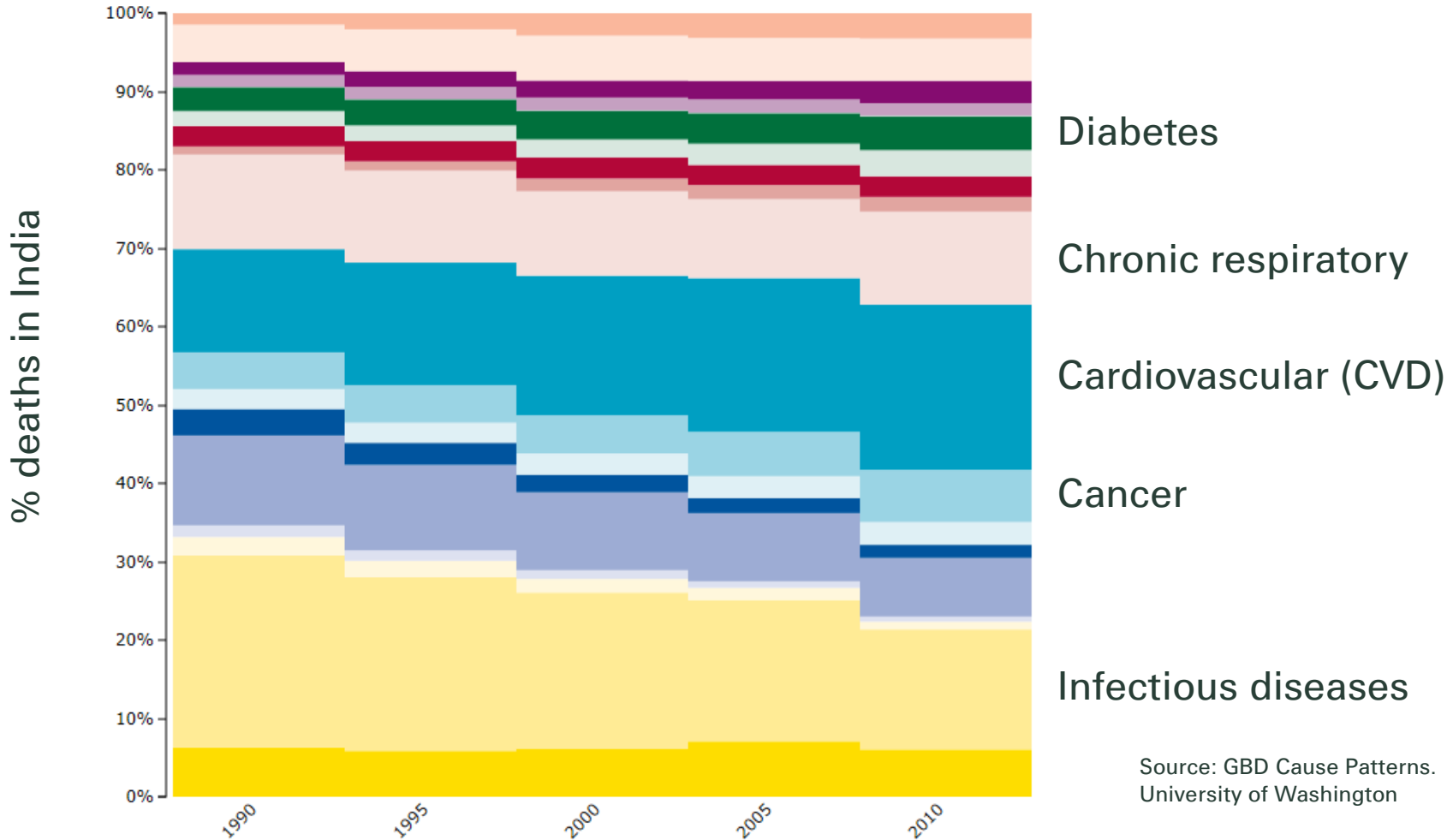
Figure 8: Mean age of death in Global Burden of Disease regions in 1970 compared with 2010

# Causes of death vary by country



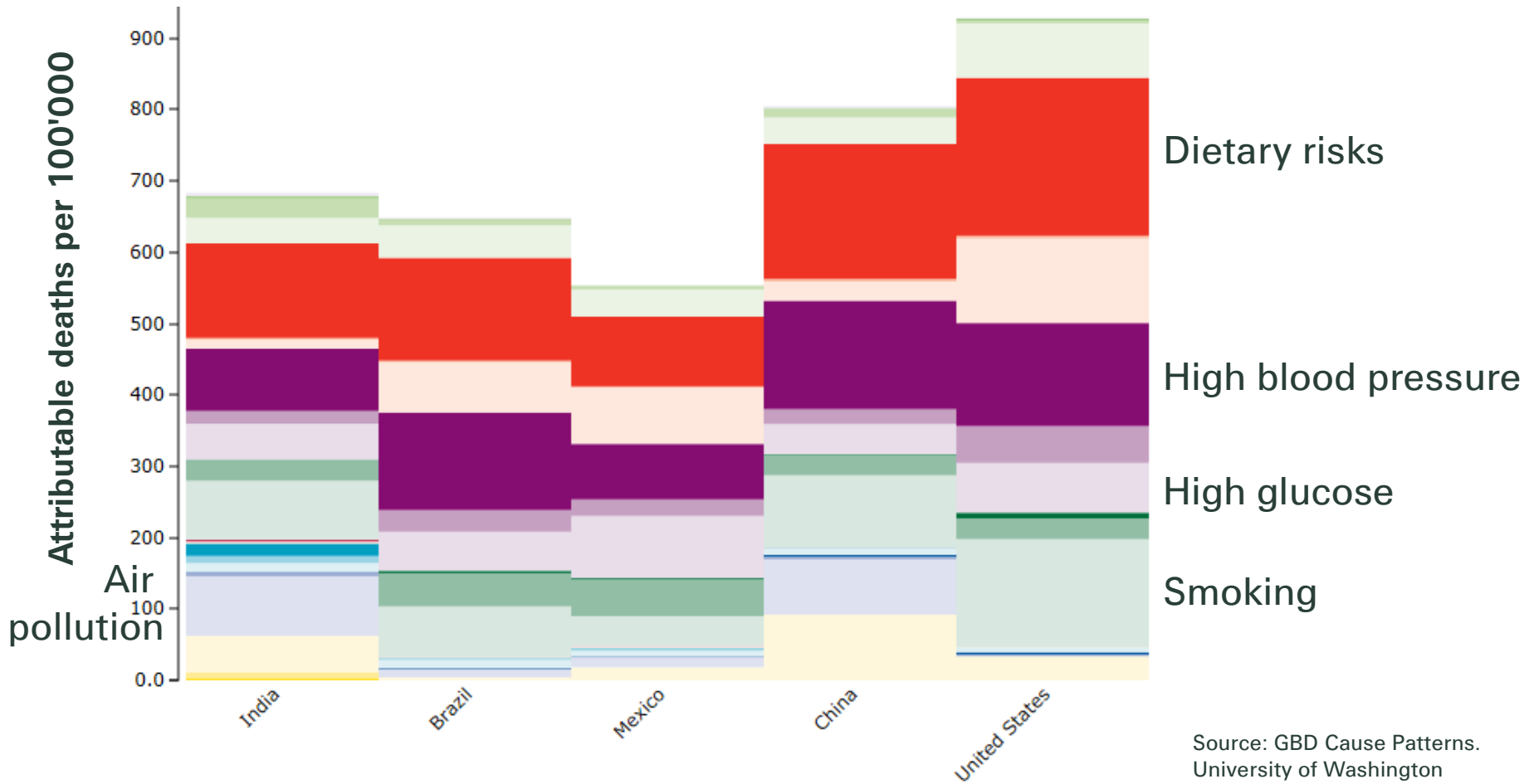
Source:  
 Institute for Health Metrics and  
 Evaluation (IHME). **GBD Cause  
 Patterns**. Seattle, WA: IHME, University  
 of Washington, 2013.  
[http://vizhub.healthdata.org/gbd-  
 cause-patterns/](http://vizhub.healthdata.org/gbd-cause-patterns/).  
 Accessed March 2015

# Contribution of death in India by cardiovascular disease has significantly increased



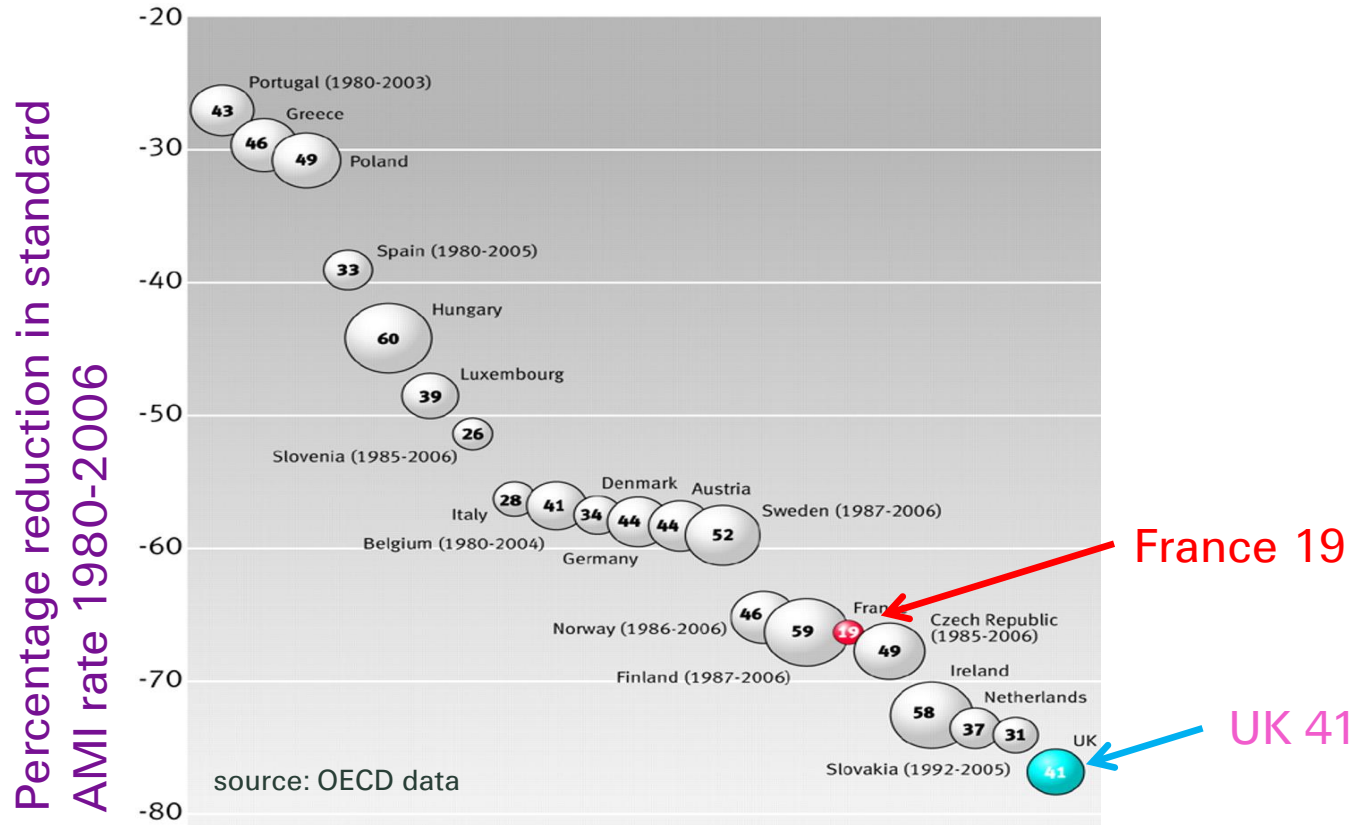
Source: GBD Cause Patterns. University of Washington

# Risk factor contribution to mortality varies by country



Source: GBD Cause Patterns.  
University of Washington

# Different standards of care lead to different mortality outcomes as shown in myocardial infarction death rates

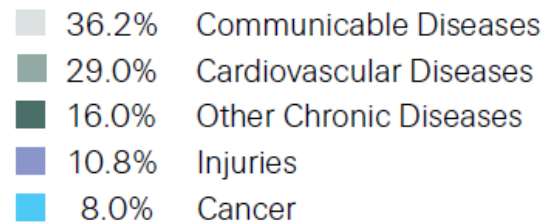


Standardized myocardial infarction death rate per 100 000 persons 1980-2006

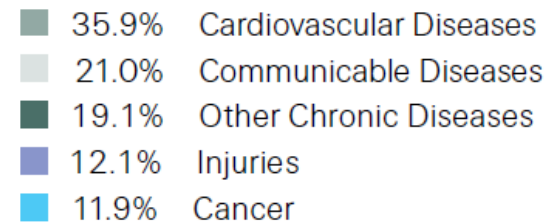


# Projected increase of death due to NCDs will raise from 54% today to 67% by 2030

Main Cause of Death in India, 2005



Main Cause of Death in India, Projected: 2030



Source: S. Reddy, S. Mohan; RDS Health Risk Factors India; Swiss Re

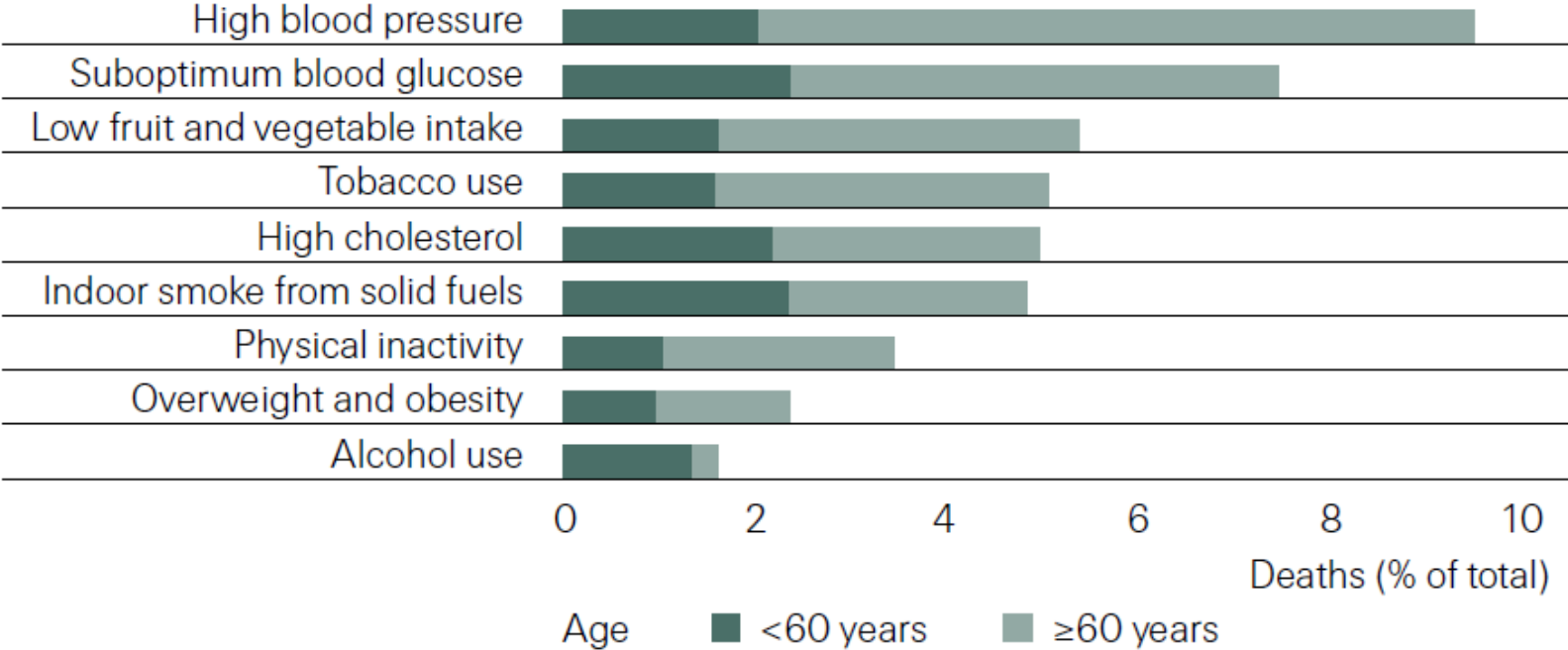
# With 65 million diabetics India is often referred to as the 'diabetes capital' of the world

## **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

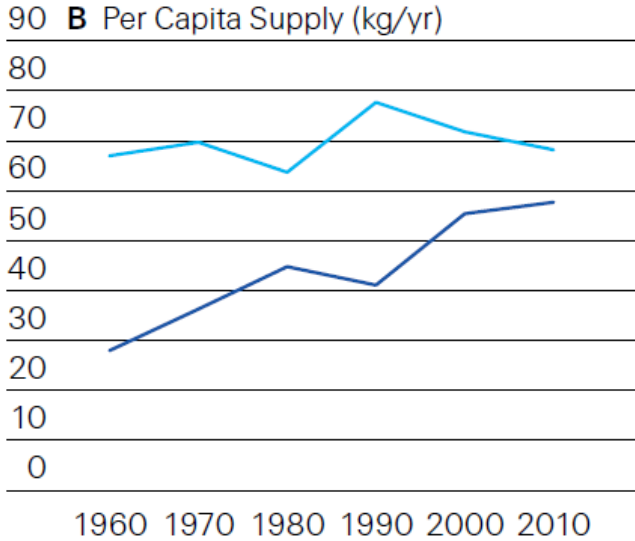
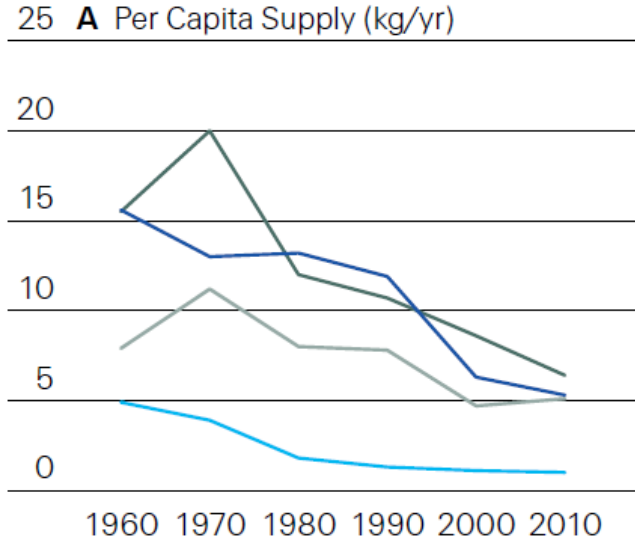
## **The nutrition transition in India: Trends in dietary intake and associations with cardiometabolic outcomes**

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

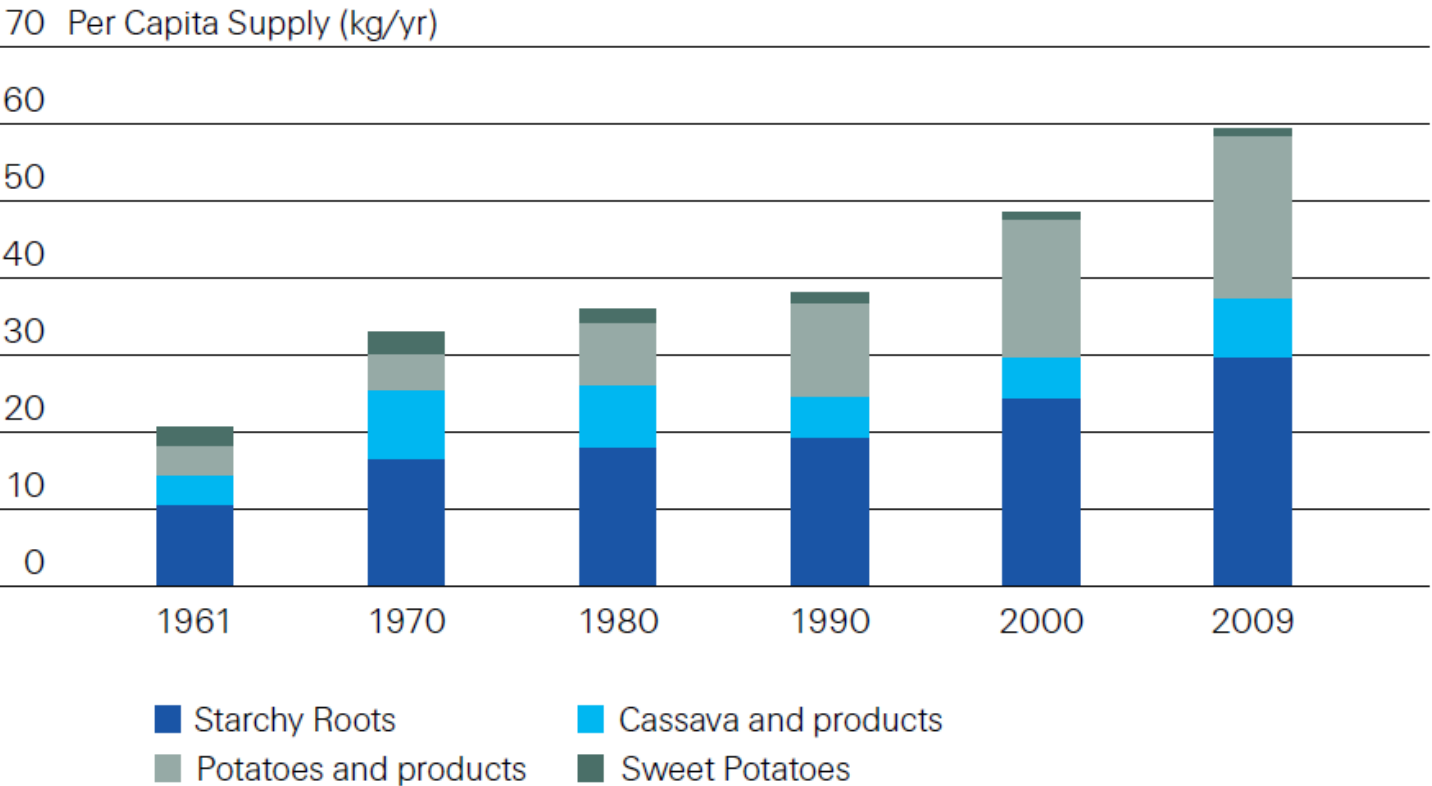


- Sorghum and products
- Barley and products
- Millet and products
- Maize and products

- Wheat and products
- Rice (Milled Equivalent)

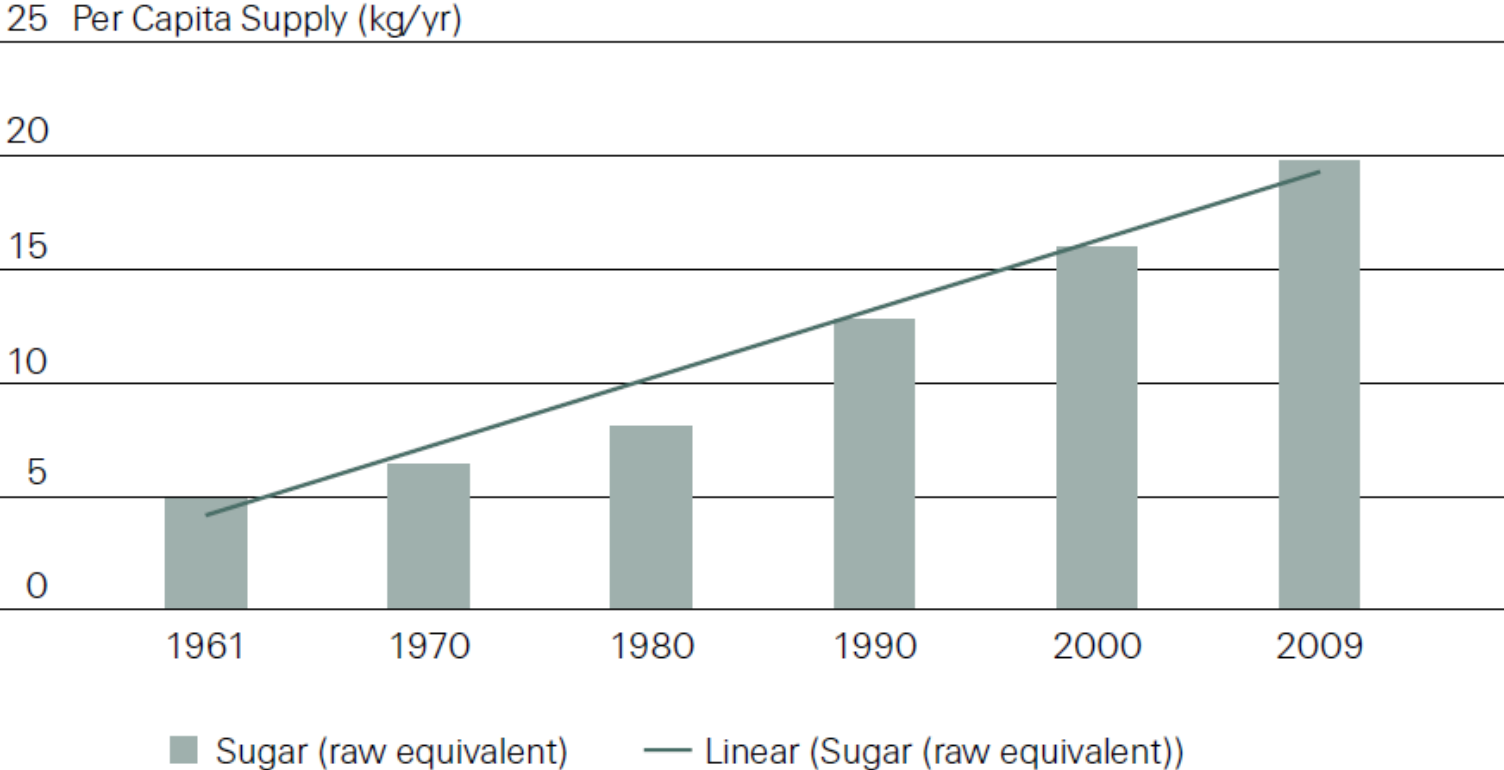
Source: Shilpa Bupathiraju; RDS Health Risk Factors India; Swiss Re

# Shift from the fresh market to processed potato products lead to high glycaemic index and glycaemic load exposure



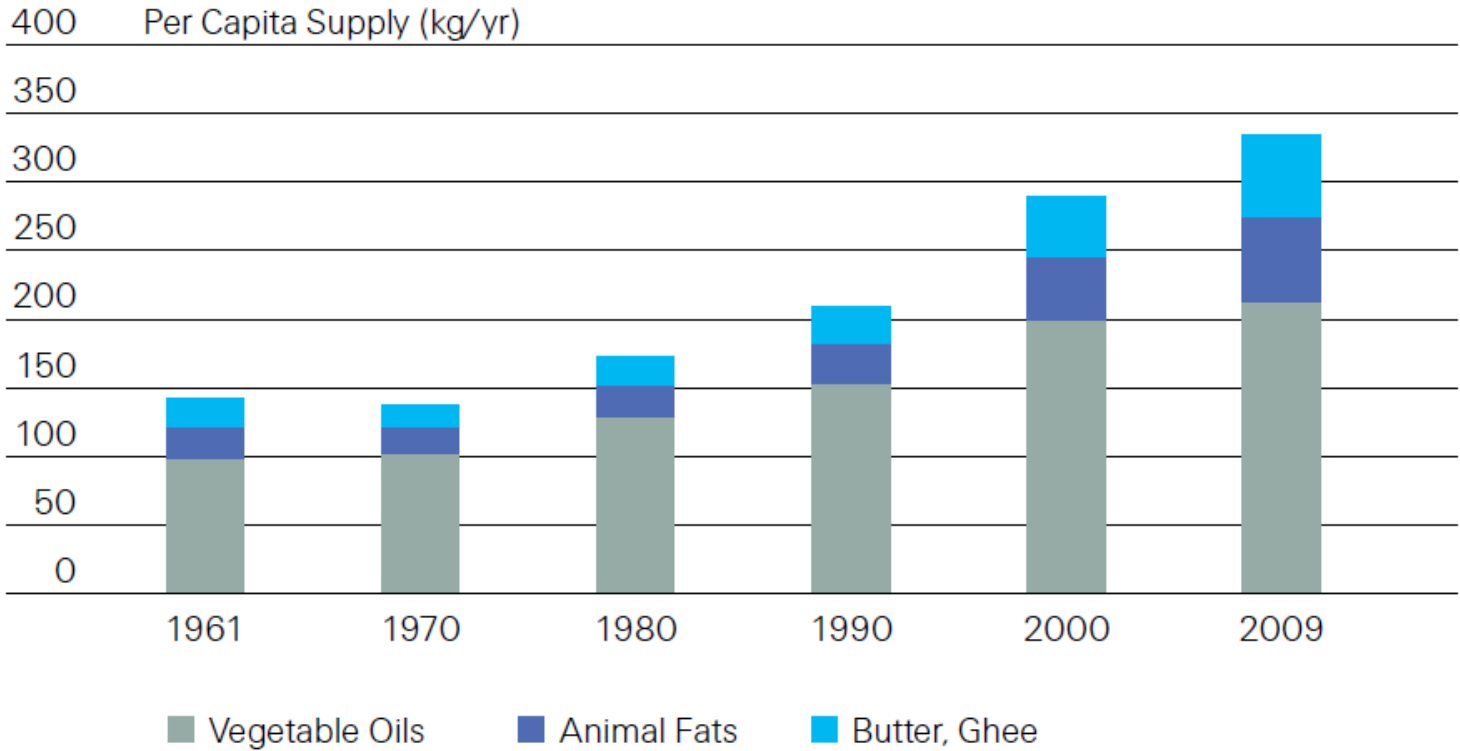
Source: Shilpa Bupathiraju; RDS Health Risk Factors India; Swiss Re

# 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)

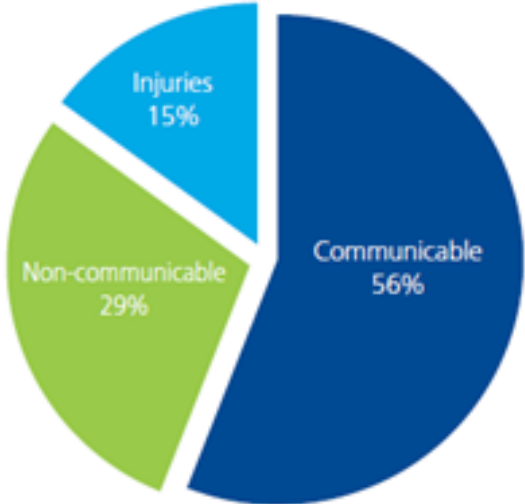
The lifestyle changes that occur as people become urbanised, including increasing consumption of **high calorie** processed foods, exposure to higher levels of ambient **air pollution**, and fewer opportunities for **physical activity**, can translate into a greater risk of obesity, diabetes, and cardiovascular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

- About 49'000 urban slums exist housing 65 million people
- Delhi has the world's highest air pollution level of PM<sub>2.5</sub> at 153 µg/m<sup>3</sup>
- Chain restaurants accounted for USD 2.5 billion in revenue in 2013, and are expected to earn USD 8 billion by 2020

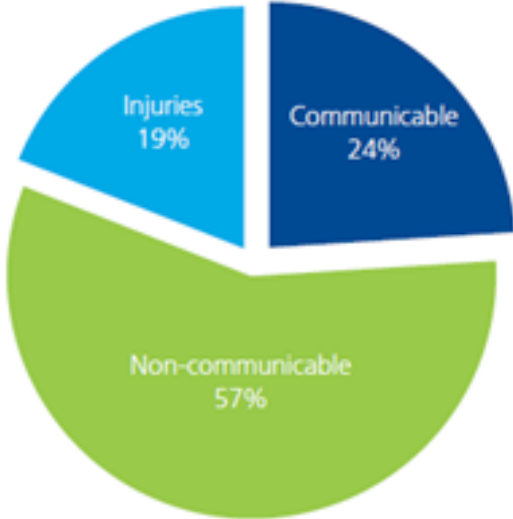
# General cost aspects of CVD

...just to remind us...the burden of non-communicable disease is on the rise

Disease Burden Estimates-1990



Disease Burden Estimates-2020



Source: Nutrition Transition in India, 1947-2007. Ministry of Women and Child Welfare.

## ...just to remind us...

- **'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 Safola 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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- Coronary heart disease is mainly responsible for heart disease deaths. By 2020, about one third of all deaths will be caused due to CHD.

...just for comparison:  
Cardiovascular disease in the US  
is a massive contributor to the  
overall health cost



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](http://www.cdc.gov/chronicdisease/resources/publications/AAG/dhdsp.htm)*

## For comparison: Cardiovascular disease in the US



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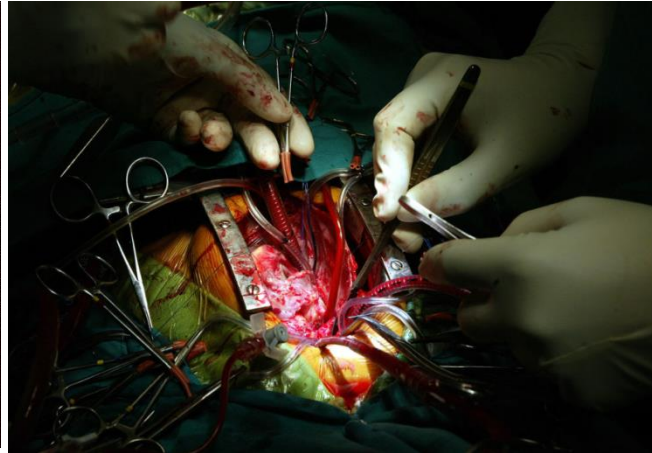
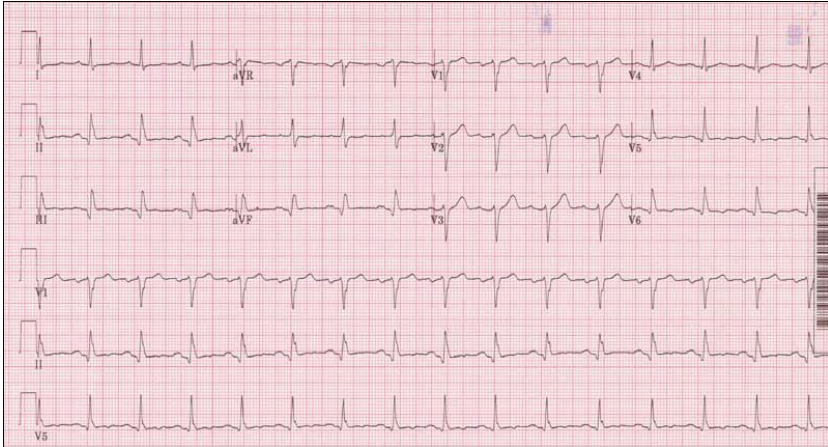
# It is essential to make the investment required to deliver better CVD primary prevention

## 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)

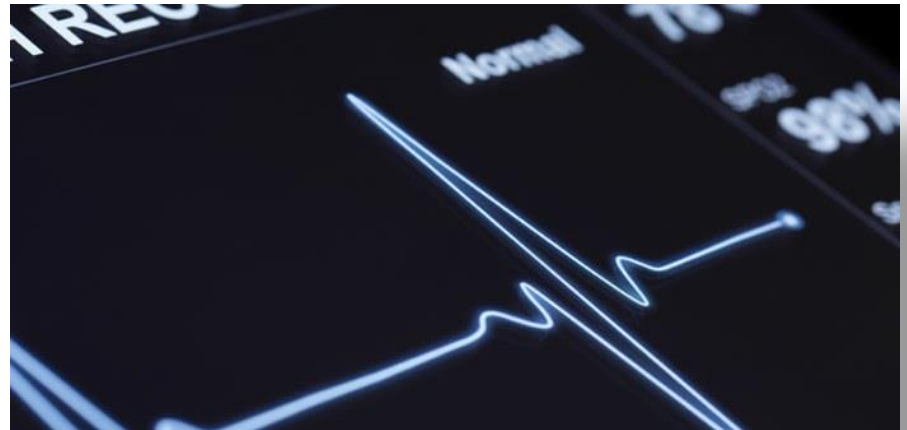
- CVD deaths in India are over 680 per 100'000 for men and 420 per 100 000 in women, which is twice those observed in the US
- As recently as 2010, the economic costs of CVD are estimated to be over USD 440 billion in the US
- CVD prevention include health care financing and insurance availability, tobacco 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

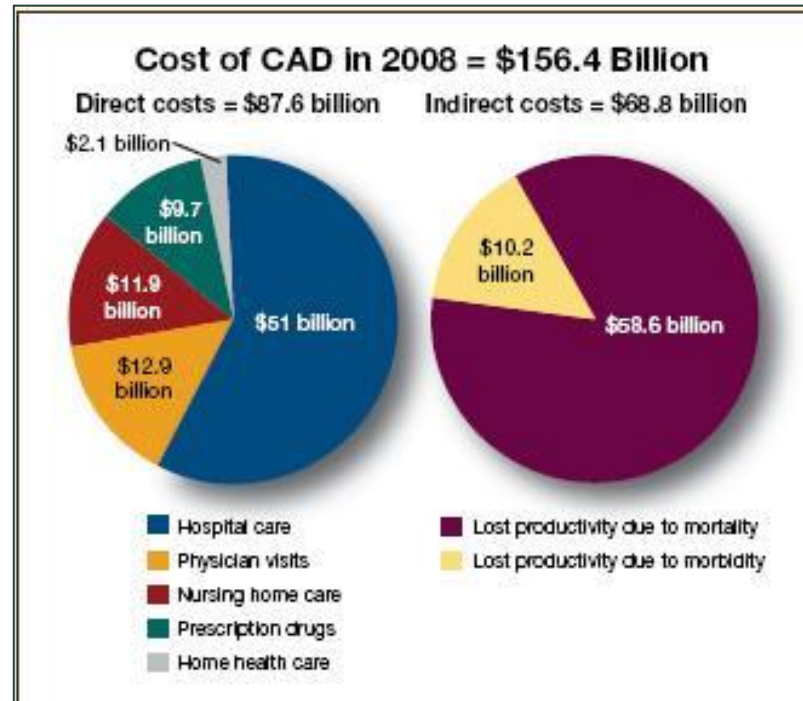
- ECG, Exercise ECG
- Angiography
- Echocardiography
- CardioCT (incl. Calcium Score)
- Perfusion scan
- MRI
- Blood test: troponins



# 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



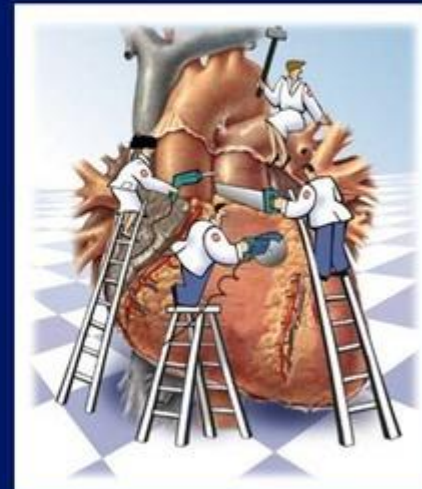
In 2008, total costs associated with coronary artery disease (CAD) were \$156.4 billion, up from \$129.9 billion in 2003.  
Source: American Heart Association. Heart Disease and Stroke Statistics—2008 Update.

# 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!



*Goetzel, Journal of Occupational and Environmental Medicine, 45(1), 5-14, 1999.*

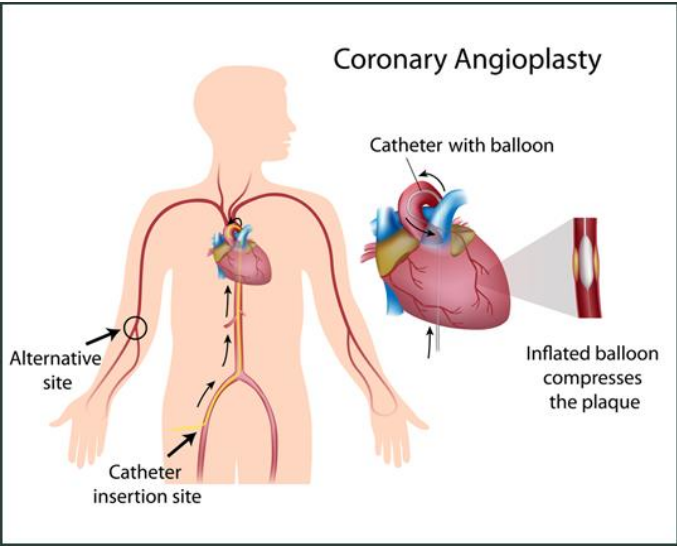
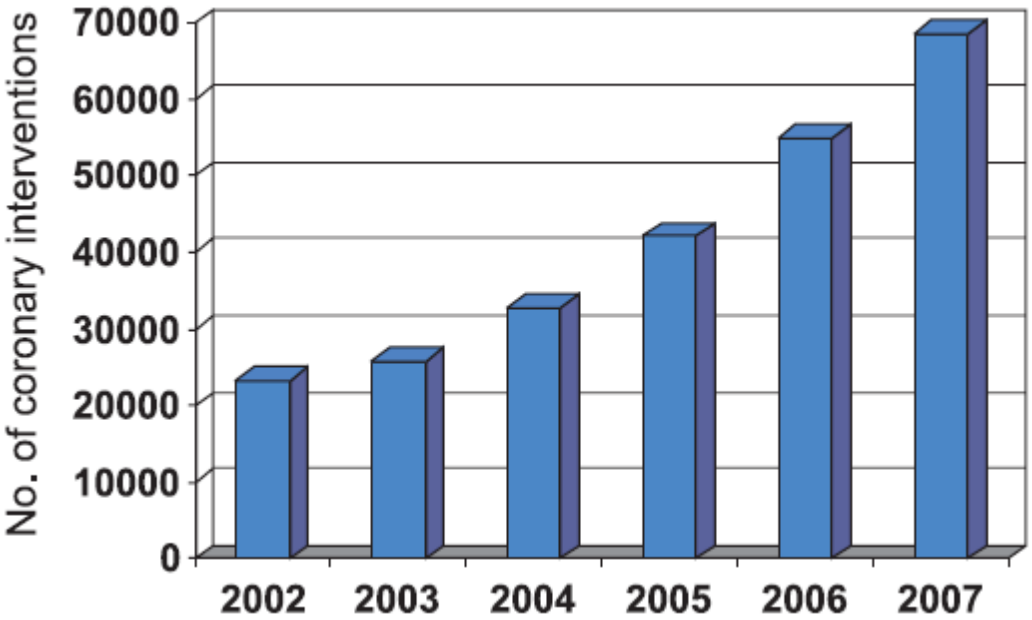
## In India we have a bit of a peculiar situation



- High class facilities (interventions)
- May distract from focus on lifestyle changes and medication to large parts of population



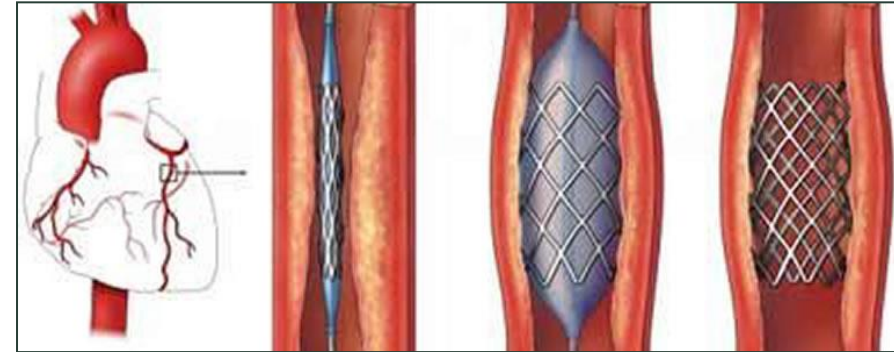
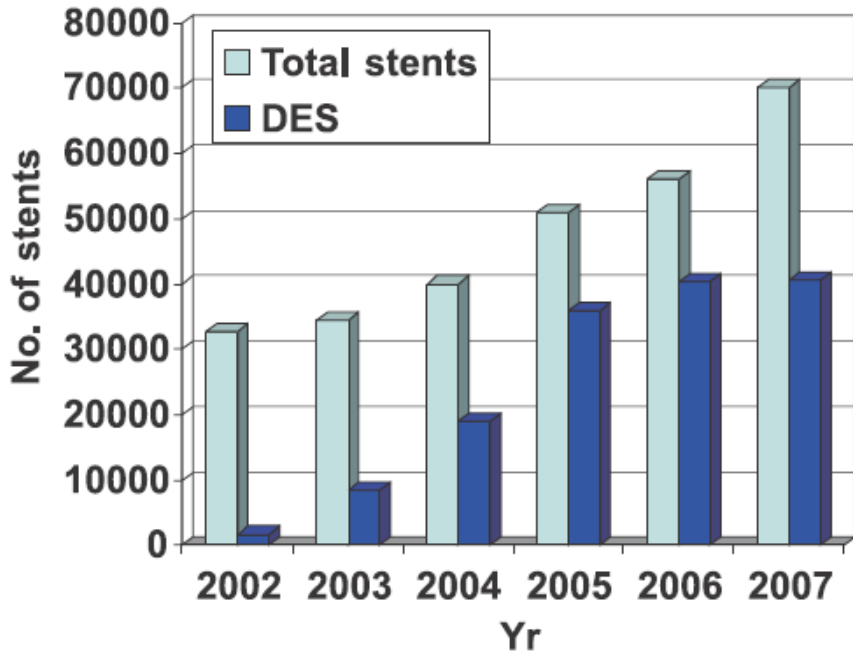
# Total coronary interventions in India



<http://www.neeman-medical.com>



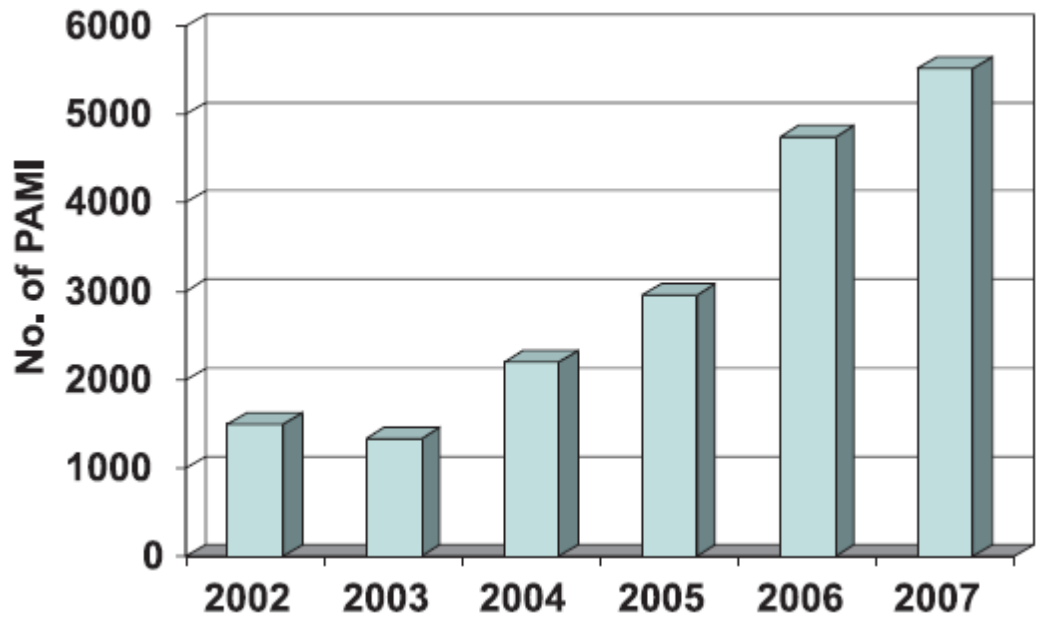
# Total number of stents and drug eluting stents (DES) usage patterns in India are increasing



	2002	2003	2004	2005	2006	2007
Total Stents	32686	34520	40,000	50980	56015	70114
DES	1715	8450	19000	28199	40397	40607

<http://www.neeman-medical.com>

# Interventions in acute MI are on the rise



<http://www.neeman-medical.com>

## ...so what is the consequence?

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

The Health Agenda, Volume 2. Issue 1. January, 2014

Kanchan Mukherjee and Vivek Koul

Economic burden of coronary heart disease on households in Jammu, India

## Various financial coping mechanisms adopted by the households [N=138]

<b>Coping Mechanism</b>	<b>Frequency</b>
Savings	89 (65%)
Insurance	47 (34%)
Loan	2 (1%)
Sale of assets	0 (0%)
<b>Total</b>	<b>138 (100%)</b>

The Health Agenda, Volume 2. Issue 1. January, 2014  
Economic burden of coronary heart disease on households in Jammu, India  
Authors: Kanchan Mukherjee and Vivek Koul

# Economic/societal burden of CVD in India

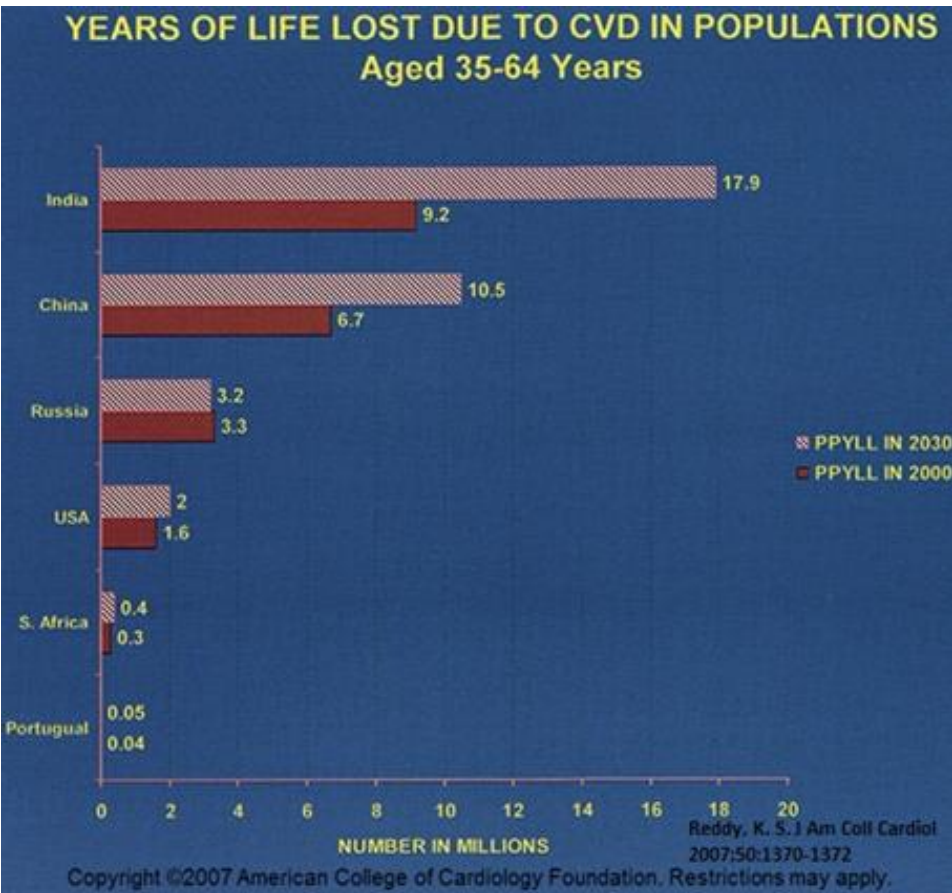
Updated: December 15, 2013 00:14 IST

## **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.

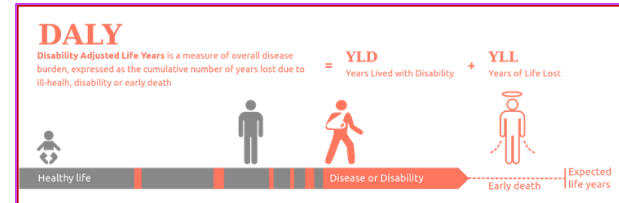
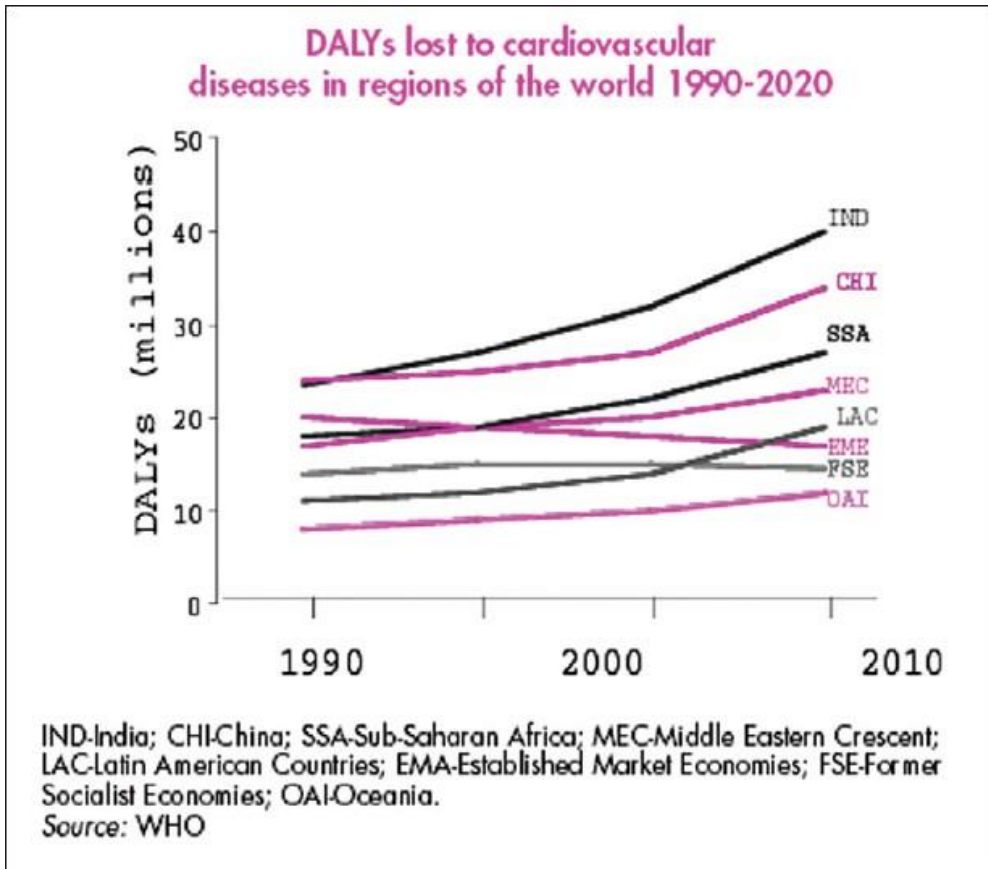


## Economic Burden of CHD in India

- 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!



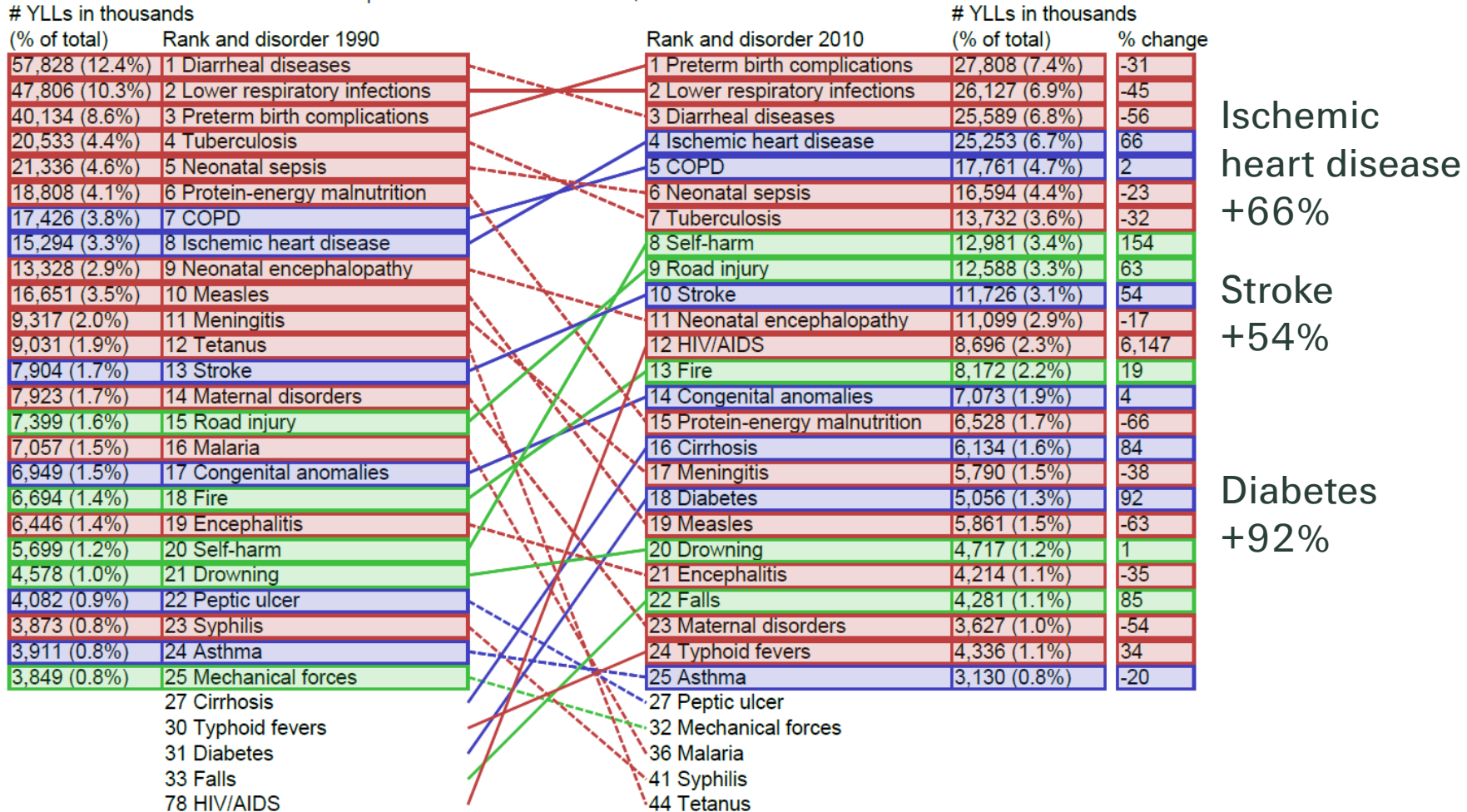
# Disability adjusted life years lost due to cardiovascular disease: By population in millions and year



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

Ranks for top 25 causes of YLLs 1990-2010, India



## 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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