

# **NONCOMMUNICABLE DISEASE IN THE DISEASE CONTROL PRIORITIES PROJECT**

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**Presented by**

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# TOPICS

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- The DCPP
- Health and Development
- Disease Burden
- Risk Factor Burden
- Cost Effectiveness of Intervention
- Copenhagen Consensus 2008



## DCPP (2002-2008)

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The Disease Control Priorities Project (DCPP) was an independent effort to assemble the *best available* information on interventions to prevent or manage diseases of major importance in developing countries. Its goal, only partially met, was to present this information in terms of comparable estimates of cost and of effectiveness for the World Bank's six regional groupings of low and middle-income countries. Closely related objectives were to assemble the best available evidence on what works in the design of health systems and on the global burden of disease and risk factors.



## Sponsors of the DCPD

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Fogarty International Center of the National  
Institutes of Health

The World Bank

The World Health Organization

The Bill & Melinda Gates Foundation



# DCP2 by the Numbers

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2 Books

14 Editors

73 (+6) Chapters

~300 Interventions

~400 Authors

1400 Pages

Six million dollars



## Major Publications of the DCP2

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*Disease Control Priorities in Developing Countries, (DCP2)*  
edited by D. Jamison, et. al.

*Global Burden of Disease and Risk Factors,*  
edited by A. Lopez, et. al.

Both published by Oxford University Press in 2006.

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The full content of both books can be downloaded as pdf files at no cost from  
the web site:

[dcp2.org](http://dcp2.org)



## NCDs and Injury in DCP2

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Topic	# of Chapters
• <b>DCP2</b>	73
• <b>Diseases</b>	25
(of which NCDs)	(10)
(of which injury)	(2)
• <b>Risk Factors</b>	8
(of which NCD)	(5)

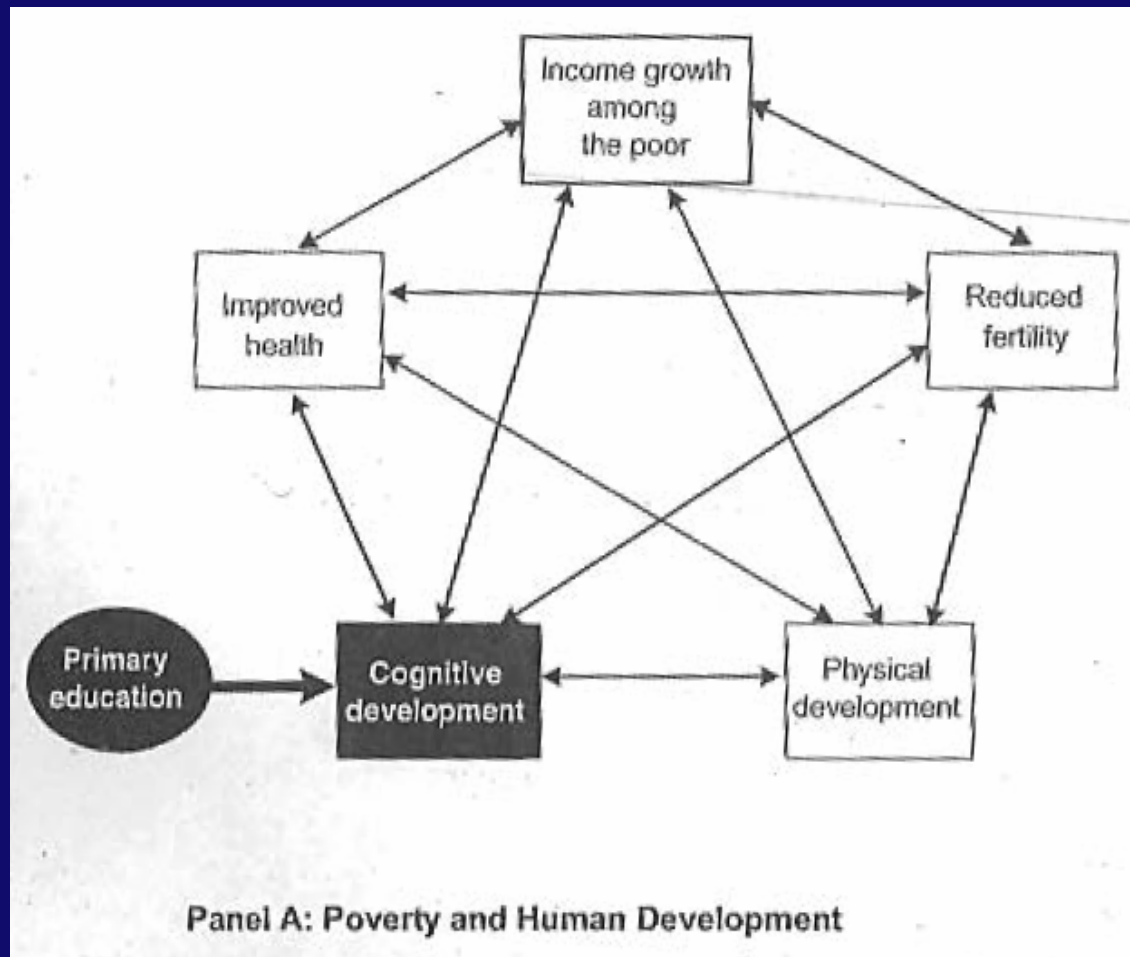


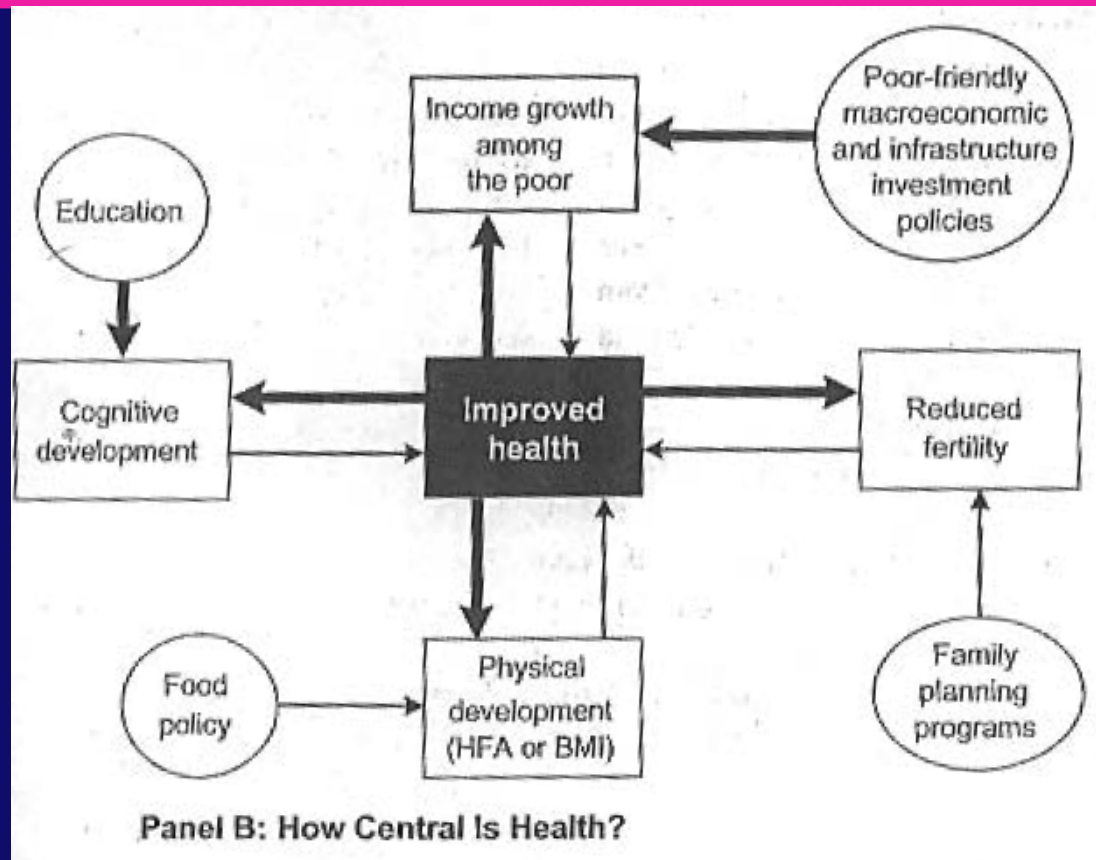
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# HEALTH AND DEVELOPMENT



Figure 12-9 Health and Development





Notes: HFA = height for age; BMI = body mass index

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# THE GLOBAL BURDEN OF DISEASE (GBD)



# GBD Goals

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- **Measure loss of health due to comprehensive set of disease injury and risk factor causes in a comparable way**
- **Decouple epidemiological assessment and advocacy**
- **Inject non-fatal health outcomes into health policy debate**
- **Use a common metric for burden of disease assessment using summary measure of population health and cost-effectiveness analysis**



# HISTORY

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- 1992-96**      **Global Burden of Disease 1990 Study**  
World Bank 1993; Murray, Lopez, and Jamison 1994;  
Murray & Lopez 1996
- 1998-2004** **WHO assessments of GBD for 1999-2002**  
World Health Reports 2000 – 2004
- 2004-06**      **Disease Control Priorities Project**  
**(GBD for 2001, World Bank regions)**  
GBD volume



## Disability Adjusted Life Years

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$$DALY = YLL + YLD$$

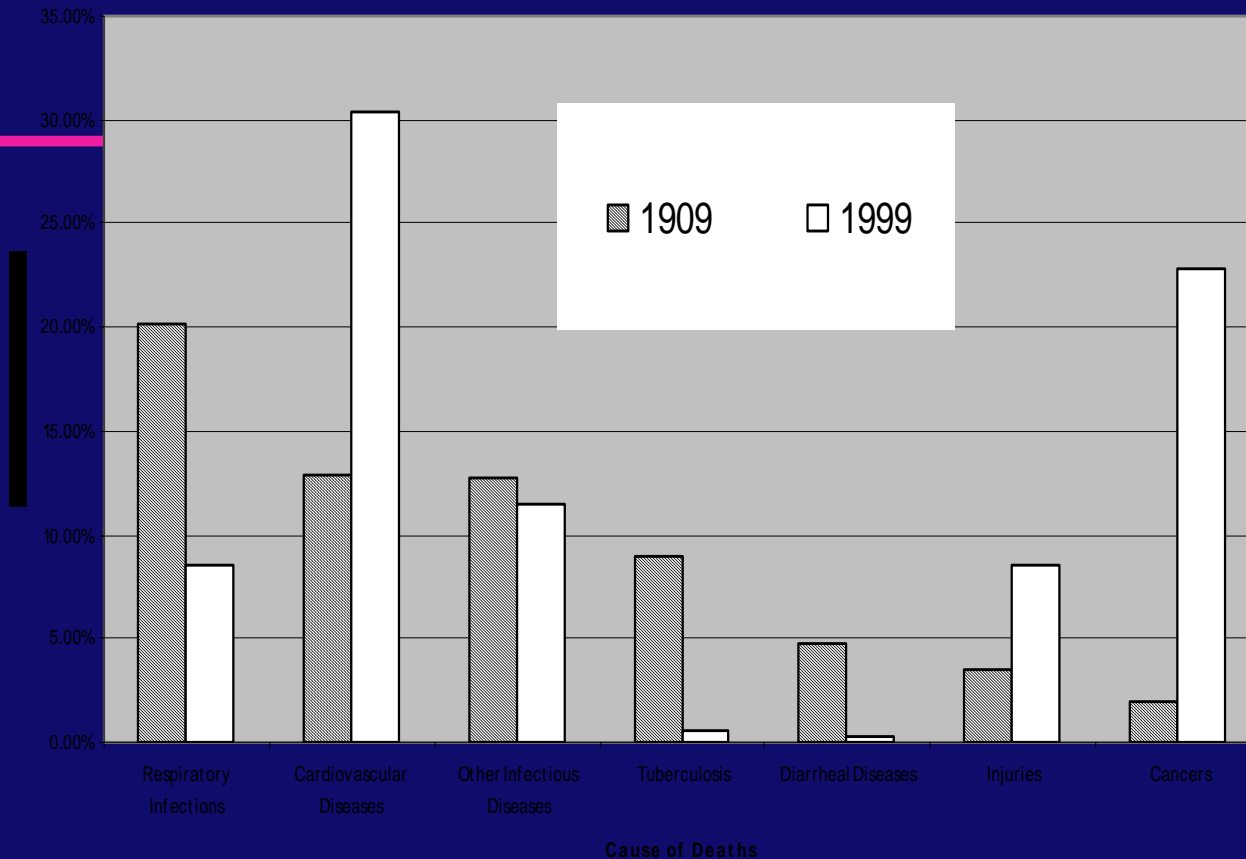
*Time is used as the common metric  
for mortality and health states*

**YLL** Years of life lost due to mortality

**YLD** Equivalent years of healthy life lost due to  
disability



# Figure 1.2: Distribution of Deaths by Cause in Chile, 1909 and 1999



*Source:* World Health Organization (1999, p.13).

*Note:* For 1909 35.1% of deaths were categorized as “other” and for 1999 the corresponding percentage was 17.5. The cause-specific percentages shown in the figure are the number from the indicated cause as a percent of the total number classified into a specific cause for that year.



## Adult mortality 15-59 years

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- Death rates have increased in sub-Saharan Africa mainly due to HIV/AIDS
- Death rates have increased in the low and middle income countries of Europe mainly due to cardiovascular diseases and injuries
- Death rates have decreased in all other regions
- Non-communicable diseases cause more than 50% of deaths in all regions except Africa and South Asia
- Non-communicable disease death rates 30% higher in low and middle income countries than high income countries
- Injuries cause one-quarter of deaths in this age group



## Causes of Death in Low- and Middle-Income Countries, Age 5 and Older (1)

	<u>Deaths</u> <u>(in millions)</u>	<u>% of total</u>
<i>Communicable, maternal, perinatal, and nutritional conditions:</i>		
TB	1.5 million	4.0%
AIDS	2.2	5.8
Respiratory infections	1.5	4.0
Maternal conditions	0.5	1.3
Other	<u>2.5</u>	<u>6.6</u>
Subtotal	8.2	21.7

Source: Aggregated from Mathers, Lopez and Murray (2006, pp. 126-131).



## Causes of Death in Low- and Middle-Income Countries, Age 5 and Older (2)

	<u>Deaths</u> <u>(in millions)</u>	<u>% of total</u>
<b><i>Noncommunicable disease:</i></b>		
Cancers	4.9 million	13.0%
Diabetes	0.7	1.9
Ischaemic and hypertensive heart disease	6.5	17.2
Stroke	4.6	12.2
Chronic obstructive pulmonary disease	2.4	6.3
Other	6.1	16.1
Subtotal	25.2	66.7

Source: Aggregated from Mathers, Lopez and Murray (2006, pp. 126-131).



## Causes of Death in Low- and Middle-Income Countries, Age 5 and Older (3)

	<u>Deaths</u> <u>(in millions)</u>	<u>% of total</u>
<b><i>Injuries:</i></b>		
Road traffic accidents	1.0 million	2.6%
Suicides	0.7	1.9
Other	2.7	7.1
Subtotal	4.4	11.6
<hr/>		
<b>TOTAL</b>	<b>37.8 million</b>	<b>100%</b>

Source: Aggregated from Mathers, Lopez and Murray (2006, pp. 126-131).



# Deaths and DALYs from SELECTED CAUSES, Over Age 5, Low- and Middle-Income Countries, 2001

Cause	% Over 5	
	Deaths	DALYs
1. TB	4 %	4 %
2. AIDS	5.8	6
3. Ischaemic Heart Disease and hypertensive heart disease	17.2	8
4. Major psychoses (unipolar and bipolar depression plus schizophrenia)	0	7

Note: Deaths in LMICs –

Between 0 and 5 – 10.6 million

Age 5 and over – 37.8 million



# Where to Find the Numbers

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**Chapter 3 of the *Global Burden of Disease and Risk Factors* reports methods, data and results on deaths and DALYs by cause.**

**Annex Table 3B reports deaths by cause (about 14), sex (exactly 2), age group (8) and World Bank region (7). Pages 126-179.**

**Annex Table 3C reports DALYs for the same groups. Pages 180-233.**

**Annex Table 2A reports death rates by country for males and females in 1990 and 2001 for under age 15 and for age 15-59, Pages 36-42.**



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# COMPARATIVE RISK ASSESSMENT (CRA)



# Attribution of disease burden and need for Comparative Risk Assessment (CRA)

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- Mortality and morbidity can be attributed to
  - disease or injury outcomes
  - risk factors
- Focussing on risk factors is key to prevention
- Comparative risk assessment should be a key input to prioritisation for:
  - health systems faced with many and varied health problems, “rule of rescue” & rare risk newsworthiness
  - research agenda



# Risks quantified in GBD 2001

## Child & maternal under-nutrition

Childhood and maternal underweight  
Iron deficiency  
Vitamin A deficiency  
Zinc deficiency

## Other nutrition-related risks & inactivity

High blood pressure  
High cholesterol  
Overweight and obesity  
Inadequate fruit and vegetable intake  
Physical inactivity

## Addictive substances

Smoking and oral tobacco  
Alcohol  
Illicit drugs

## Sexual and reproductive health risks

Unsafe sex  
Non-use and ineffective use of contraception

## Environmental risks

Unsafe water, sanitation, and hygiene  
Urban air pollution  
Indoor smoke from solid fuels  
Lead exposure  
Climate change

## Occupational risks

Risk factors for injury  
Carcinogens  
Airborne particulates  
Ergonomic stressors  
Noise

## Other selected risks to health

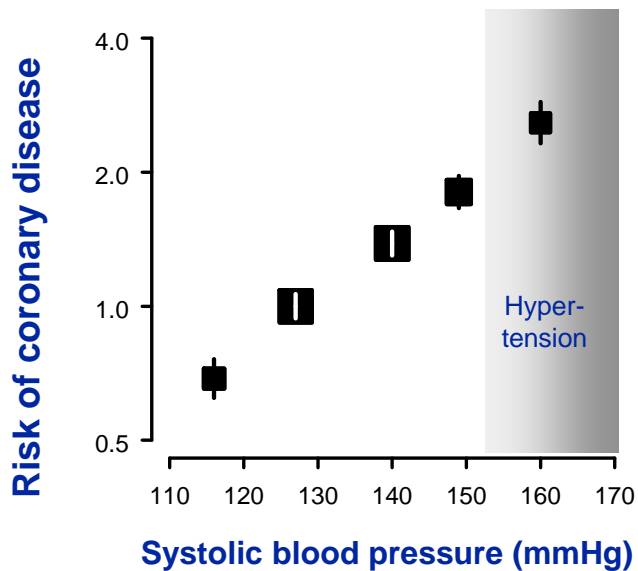
Contaminated health care injections  
Child sexual abuse

## Distributions of risks by poverty

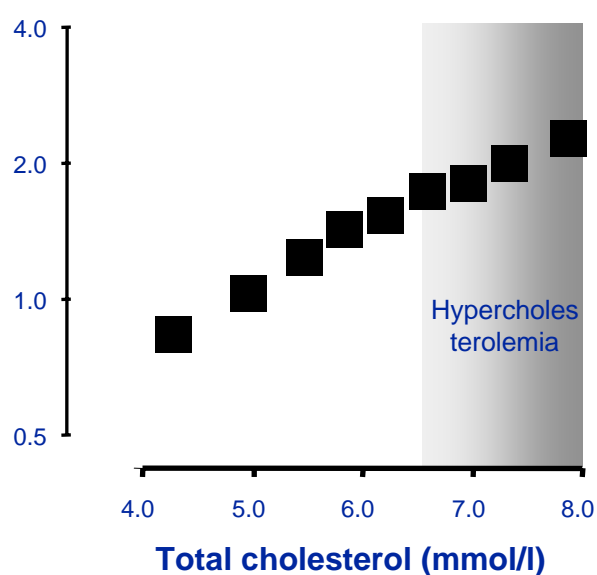


# Continuous exposure and disease associations

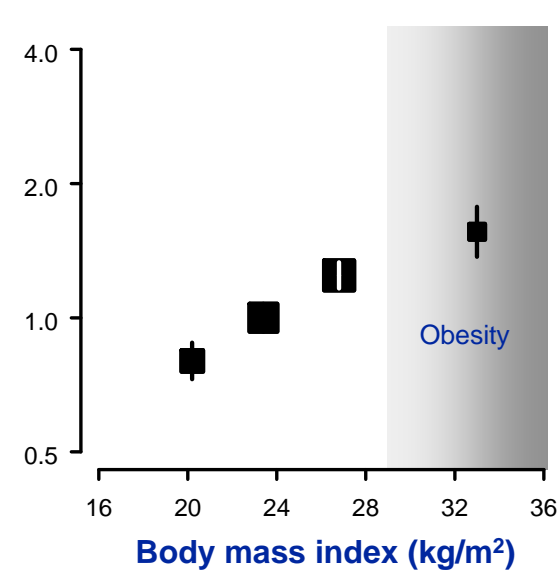
### Blood pressure



### Cholesterol

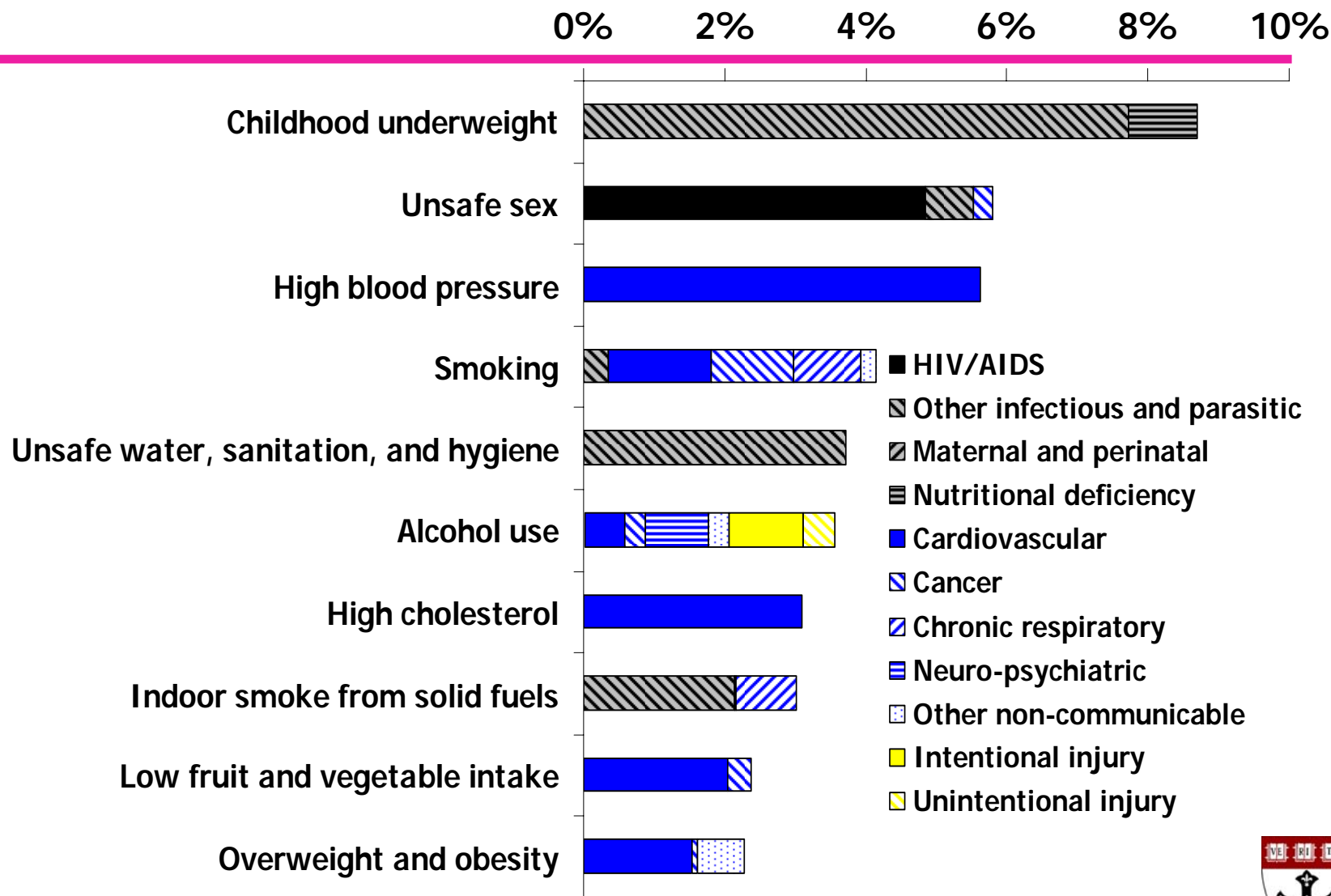


### Body mass index



## Low and Middle income: Attributable DALY'S

Attributable disease burden (% regional DALYs; total 1.39 billion)



## Contributions of Risk Factors to CVD Mortality, Low- and Middle-Income Countries, 2001

Risk factor	Ischaemic heart disease (PAF, %)	Stroke (PAF, %)
1. High blood pressure	47 %	54 %
2. High cholesterol	43	12
3. Smoking	11	8
4. Overweight and obesity	14	7
5. Alcohol use	4	5
6. Physical inactivity	20	6
7. Low fruit and vegetable intake	27	10
8. Urban air pollution	4	4
Joint PAF	79	61

Source: Ezzati, et. al., DCPP BOD volume, 2006.



## CRA - Conclusions

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- Role of established risk factors greater than commonly thought
- In many world regions, the leading 5 risk factors account for more than one-third of mortality and one-quarter of DALYs
- Risks are widespread – all risk factors have global impact, and the burden of many occurs almost exclusively in developing countries



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# THE COST-EFFECTIVENESS OF INTERVENTION



# CEA

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CEA is not the criterion to use for the appropriateness of public sector finance.

CEA is not to be used without a good deal of political sensitivity.

CEA does give the price of buying health in different ways.



# How Much Health Will a Million Dollars Buy?

## Service or Intervention

- **Preventing and Treating Non-Communicable Disease**
  - Taxation of tobacco products
  - Treatment of MI or heart attacks with an inexpensive set of drugs
  - Lifelong treatment of heart attack and stroke survivors with daily 'polypill'
  - Bypass surgery for less severe coronary artery disease

## DALYs Averted (\$ per DALY)

24,000-330,000 (\$3-50)

40,000-100,000 (\$10-25)

1,000-1,400 (\$700-1,000)

Very small (Very high)



## RESOURCES

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- [dcp2.org](http://dcp2.org): DCP2's NCD chapters are pretty good. They are taken seriously in ministries and in WHO, so use them.
- The best distillation of DCP2 and other work on NCD's is the World Bank's *Public Policy and the Challenge of Chronic Noncommunicable Diseases* (Adeyi, Smith and Robles, 2007).



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# COPENHAGEN CONSENSUS 2008

Sorry, we're out of time.

