Chronic diseases and risks: the long-term view

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World Health Organisation
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What we know about the global burden of chronic diseases

- Most mortality in the world is the result of chronic diseases
- Most deaths from chronic diseases are in developing countries
- Incidence and death rates from chronic diseases are rising in developing countries
- In developing countries, deaths are more likely to occur amongst younger people relative to developed economies
- Rates of chronic diseases can be explained by several key risk factors
What is implied by “long-term view”?

- Examining long-term trends
  - Disease incidence and mortality
  - Risk factors
  - Health and poverty
  - Demography
  - Economic impacts

- National long-term policy response
  - Understand national long-term implications
  - Work with WHO
  - Attract funding
  - Tackle upstream forces
Long-term trends

1 DISEASE
  ▶ Death rates and incidence of chronic diseases are rising globally

2 RISK FACTORS
  ▶ Prevalence of risk factors is rising
  ▶ Risk factors are accumulating throughout the life course

3 HEALTH AND POVERTY
  ▶ As risk factors accumulate over the life course, the disease burden is increasingly falling on poorer populations

4 DEMOGRAPHY
  ▶ Increasing share of elderly in global population

5 ECONOMIC IMPACTS
  ▶ Economics costs are high and rising
  ▶ Loss of productive years of the working age population

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Long-term trends - Disease

Global Chronic Disease Burden - 1990-2020
(by disease group in developing countries)

1990
- Communicable diseases, maternal and perinatal conditions and nutritional deficiencies: 49%
- Noncommunicable Conditions: 15%
- Neuropsychiatric Disorders: 9%
- Injuries: 27%

2020 (baseline scenario)
- Communicable diseases, maternal and perinatal conditions and nutritional deficiencies: 21%
- Noncommunicable Conditions: 43%
- Neuropsychiatric Disorders: 14%
- Injuries: 22%
### Table 1.5

**Estimated top 10: Number of people with impaired glucose tolerance (20-79 age group), 2003 and 2025**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 India</td>
<td>85.6</td>
<td>1 India</td>
<td>132.0</td>
</tr>
<tr>
<td>2 China, People’s Republic of</td>
<td>33.2</td>
<td>2 China, People’s Republic of</td>
<td>54.3</td>
</tr>
<tr>
<td>3 Russia</td>
<td>17.8</td>
<td>3 Indonesia</td>
<td>20.9</td>
</tr>
<tr>
<td>4 USA</td>
<td>13.9</td>
<td>4 USA</td>
<td>19.3</td>
</tr>
<tr>
<td>5 Indonesia</td>
<td>12.9</td>
<td>5 Russia</td>
<td>18.3</td>
</tr>
<tr>
<td>6 Japan</td>
<td>12.6</td>
<td>6 Japan</td>
<td>12.7</td>
</tr>
<tr>
<td>7 Brazil</td>
<td>7.5</td>
<td>7 Brazil</td>
<td>11.7</td>
</tr>
<tr>
<td>8 Ukraine</td>
<td>6.2</td>
<td>8 Pakistan</td>
<td>10.9</td>
</tr>
<tr>
<td>9 Pakistan</td>
<td>5.7</td>
<td>9 Bangladesh</td>
<td>10.1</td>
</tr>
<tr>
<td>10 Bangladesh</td>
<td>5.3</td>
<td>10 Nigeria</td>
<td>7.4</td>
</tr>
</tbody>
</table>

China

Postgraduate course
China

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Chart 3.1

Cancers, urban age-specific death rates 1986 & 1999

Chart 3.2

Cancers, rural age-specific death rates 1986 & 1999
Long-term trends - Risk Factors

- Prevalence of risk factors is rising

**Attributable Mortality (20 leading risk factors)**

- High blood pressure
- Tobacco
- High cholesterol
- Underweight
- Unsafe sex
- Low fruit and vegetable intake
- High BMI
- Physical inactivity
- Alcohol
- Unsafe water, sanitation, and hygiene
- Indoor smoke from solid fuels
- Iron deficiency
- Urban air pollution
- Zinc deficiency
- Vitamin A deficiency
- Unsafe health care injections
- Occupational risk factors for injury
- Occupational particulates
- Lead exposure
- Illicit drugs

- Attributable mortality in thousands (Total 55,861)

- High-mortality developing
- Lower-mortality developing
- Developed
Global cigarette consumption, 1880-2000

Source: Mackay and Eriksen, 2002
Percentage change in alcohol consumption, per person per year, by region, 1990-2000

Source: Millstone and Lang, 2003
Percent Change in total cholesterol in selected regions of China, 35-64 years, 1988-1993

Source: Zhao Dong
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Trends in Obesity (BMI $>$ 30), Brazil

Source: WHO Global NCD InfoBase
Long-term trends - Risk Factors

- Risk factors are accumulating throughout the life course

  Children and adolescents are increasingly exposed to inter-related risk factors that increase the probability of chronic disease in adulthood
A Life Course Approach

Fetal Life
- SES
- Maternal nutritional status & obesity, fetal growth

Infancy and Childhood
- SES
- Nutritional diseases
- Linear growth
- Obesity
- Lack of PA, diet, alcohol, smoking
- SE potential

Adolescence
- Obesity

Adult Life
- Established adult risk factors (behavioral/biological)

Accumulated Risk

Range of Individual Risk

Development of chronic disease

Age
Long-term trends - Health and Poverty

- As risk factors accumulate over the life course, the disease burden will fall increasingly on poorer populations
  - Currently often assumed that chronic diseases are “diseases of affluence”
  - But already high exposure to risk factors (especially tobacco and alcohol) amongst poorer populations in developing economies
Figure 3: Smoking is More Common Among the Less Educated

Smoking Prevalence Among Men in Chennai (India) by Education Levels

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Smoking Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>64</td>
</tr>
<tr>
<td>&lt; 6 Years</td>
<td>58</td>
</tr>
<tr>
<td>6-12 Years</td>
<td>42</td>
</tr>
<tr>
<td>&gt;12 Years</td>
<td>21</td>
</tr>
</tbody>
</table>
Long-term trends - Health and Poverty

… although at the moment the relationship between risk-factor exposure and chronic disease mortality and morbidity is mixed (due to the variability and long-time lag between exposure and outcomes), over the long-term, exposure to risk factors will lead to a higher disease burden amongst poor populations.
Long-term trends - Demography

- Increasing share of elderly in global population

Projected shares of elderly in total population by world region (in percent)

Economic impact is high and rising

Economic costs of diet-related chronic diseases in China and India, 1995

<table>
<thead>
<tr>
<th>Country</th>
<th>Cost in billion US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>11.74</td>
</tr>
<tr>
<td>India</td>
<td>2.25</td>
</tr>
</tbody>
</table>

- **Productivity losses from premature death**: 4.41 billion US$
- **Hospital costs**: 2.25 billion US$
- **Total cost**: 11.74 billion US$ (China) + 4.41 billion US$ (China) + 2.25 billion US$ (India) = 18.4 billion US$
Estimated total indirect and direct costs attributed to diabetes in Latin America and the Caribbean, 2000

Source: Barceló et al., 2003
Cost of diabetes care per year by region, 2002 and 2025

Estimated cost of diabetes care per year, 2002
Predicted cost of diabetes care per year, 2025
Tobacco...

**Health care costs**

<table>
<thead>
<tr>
<th>Country</th>
<th>Health care costs attributable to tobacco, latest available estimates, US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>$6 billion</td>
</tr>
<tr>
<td>Canada</td>
<td>$1.6 billion</td>
</tr>
<tr>
<td>China</td>
<td>$3.5 billion</td>
</tr>
<tr>
<td>Germany</td>
<td>$14.7 billion</td>
</tr>
<tr>
<td>New Zealand</td>
<td>$84 million</td>
</tr>
<tr>
<td>Philippines</td>
<td>$600 million</td>
</tr>
<tr>
<td>South Africa</td>
<td>$1 billion</td>
</tr>
<tr>
<td>UK</td>
<td>$2.25 billion</td>
</tr>
<tr>
<td>USA</td>
<td>$76 billion</td>
</tr>
</tbody>
</table>

**Fires:** Annual cost of fires caused by smoking is US$27 billion

**Absenteeism:** In the US, smokers take on average of 6.16 sick days per year compared with 3.86 of people who have never smoked; in 1994, it costs Telecom Australia $16.5 million in costs of loss of time off work.

**Cumulative costs on the workplace:** In the USA, workplace smoking costs $47 billion every year.

**Trash collection:** 20% of all trash collected in the USA is cigarette butts.
Obesity...

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Percent of national health care spending attributable to obesity (actual cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1989-90</td>
<td>2% (AUS$395)</td>
</tr>
<tr>
<td>Canada</td>
<td>1997</td>
<td>2.4% (CAN$1.8 billion)</td>
</tr>
<tr>
<td>France</td>
<td>1992</td>
<td>2% (FF11.9 billion)</td>
</tr>
<tr>
<td>Portugal</td>
<td>1996</td>
<td>3.5% (PTE 46.2 billion)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>1991</td>
<td>2.5% (NZ$135 million)</td>
</tr>
<tr>
<td>USA</td>
<td>2003</td>
<td>6% (US$75 billion) (excluding children)</td>
</tr>
</tbody>
</table>

Sources: Thompson and Wolf (2001); Finkelstein et al. (2003); Finkelstein et al. (2004); Kuchler and Ballenger (2002)
Loss of productive years of the working age population

Annual CVD disability payments: South Africa workforce, age 36-65

Source: Leeder et al., 2004
Why take a long-term view of chronic diseases? Long-Term Policy Response

➢ Over the long-term, the world will face an enormous health and economic burden from morbidity and mortality from chronic diseases.
Prevalence of unhealthy consumption

Socio-economic Development

High

Low

Economic/Fiscal
Legislate/Regulate
Global action
Pro-poor

Observed pattern

Desired path

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Chronic diseases: the long-term view
The long-term policy response has been weak.

National health ministries have:

- Few clear policies and strategies
- Limited resources
- Fragmented and uncoordinated care
- Low commitment to prevention
- Lack of surveillance systems
- Inadequate treatment guidelines
- Inadequate Primary Health Care capacity to deal with chronic diseases is poor
- Insufficient resources invested in research
Long-Term Policy Response

• What should health and medical communities be asking their national health ministry to do in response to the rising threat of chronic diseases?
  • Understand national long-term implications
  • Work with WHO
  • Attract funding
  • Tackle upstream forces
Long-Term Policy Response 1

- Understand national long-term implications
  - Better understand economic impacts (macroeconomics and health)
  - Build long-term scenarios to develop targets (e.g. Wanless scenarios in UK)
  - Lead to long-term targets with accompanying investments
  - Provide a clear vision of increased life expectancy and compression of morbidity
Extracts of scenarios (Wanless, 2003)

<table>
<thead>
<tr>
<th>Changes in demand for care:</th>
<th>Solid progress</th>
<th>Slow uptake</th>
<th>Fully engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UK Life expectancy at birth by 2022</strong></td>
<td>Men: 80.0 Women 83.8</td>
<td>Men: 78.7 Women: 83.0</td>
<td>Men: 81.6 Women: 85.5</td>
</tr>
<tr>
<td><strong>Long-term ill health among the elderly</strong></td>
<td>No Change in rates of ill health</td>
<td>Increase in long-term ill health</td>
<td>Healthy life expectancy increases broadly in line with life expectancy</td>
</tr>
<tr>
<td><strong>Acute ill health among the elderly</strong></td>
<td>5 per cent reduction by 2022</td>
<td>10 per cent increase by 2022</td>
<td>10 per cent reduction by 2022</td>
</tr>
<tr>
<td><strong>Health promotion (smoking, exercise, diet etc.)</strong></td>
<td>Meet current public health targets leading to reductions in hospital admissions and GP visits</td>
<td>No change</td>
<td>Go beyond current public health targets leading to greater reductions in hospital admissions and GP visits, combined with higher spending on health promotion</td>
</tr>
<tr>
<td><strong>Health Seeking behaviour among over 65s</strong></td>
<td>'Old old' match use of hospital and GP care per head of 'young old' by 2022</td>
<td>No</td>
<td>'Old old' match use of hospital and GP care per head of 'young old' by 2012</td>
</tr>
</tbody>
</table>
### Long-Term Policy Response 2

#### Work with WHO

- Many WHO Resolutions

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**Table 8: WHA Resolutions on chronic diseases and their risk factors, 1956-2004**

<table>
<thead>
<tr>
<th>WHA Resolutions</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHA9.41 Cardiovascular diseases and hypertension</td>
<td>WHA 9th, May 1956</td>
</tr>
<tr>
<td>WHA10.18 Epidemiology of Cancer</td>
<td>WHA 10th, May 1957</td>
</tr>
<tr>
<td>WHA15.3 United Nations Prize for the International Encouragement of Scientific Research into the Control of Cardiovascular Diseases</td>
<td>WHA 15th, May 1962</td>
</tr>
<tr>
<td>WHA17.49 Participation of WHO in a World Research Agency for Cancer</td>
<td>WHA 17th, May 1964</td>
</tr>
<tr>
<td>WHA23.32 Health consequences of smoking</td>
<td>WHA 23rd, May 1970</td>
</tr>
<tr>
<td>WHA24.48 Health consequences of smoking</td>
<td>WHA 24th, May 1971</td>
</tr>
<tr>
<td>WHA29.55 Smoking and health</td>
<td>WHA 29th, May 1976</td>
</tr>
<tr>
<td>WHA31.56 Health hazards of smoking</td>
<td>WHA 31st, May 1978</td>
</tr>
<tr>
<td>WHA33.35 WHO's program on smoking and health</td>
<td>WHA 33rd, May 1980</td>
</tr>
<tr>
<td>WHA39.14 Tobacco or health</td>
<td>WHA 39th, May 1986</td>
</tr>
<tr>
<td>WHA41.25 Tobacco or health</td>
<td>WHA 41st, May 1988</td>
</tr>
<tr>
<td>WHA42.19 Tobacco or health</td>
<td>WHA 42nd, May 1990</td>
</tr>
<tr>
<td>WHA44.26 Smoking and travel</td>
<td>WHA 44th, May 1991</td>
</tr>
<tr>
<td>WHA45.19 Multisectoral collaboration on WHO's program on tobacco or health</td>
<td>WHA 45th, May 1992</td>
</tr>
<tr>
<td>WHA46.8 Use of tobacco tins in United Nations system buildings</td>
<td>WHA 46th, May 1993</td>
</tr>
<tr>
<td>WHA46.11 An international strategy for tobacco control</td>
<td>WHA 46th, May 1993</td>
</tr>
<tr>
<td>WHA46.15 Tobacco-or-health programme</td>
<td>WHA 46th, May 1993</td>
</tr>
<tr>
<td>WHA47.17 International framework convention for tobacco control</td>
<td>WHA 47th, May 1994</td>
</tr>
<tr>
<td>WHA50.19 Framework convention on tobacco control</td>
<td>WHA 50th, May 1995</td>
</tr>
<tr>
<td>WHA51.1 WHO Framework convention on tobacco control</td>
<td>WHA 51st, May 1996</td>
</tr>
<tr>
<td>WHA52.80 Multisectoral collaboration on WHO's program on alcohol-related problems</td>
<td>WHA 52nd, May 1997</td>
</tr>
</tbody>
</table>
Long-Term Policy Response 3

Funding
- International donors
- World Bank
- Development aid
Long-Term Policy Response 4

Tackle upstream forces

- Given the rapidly rising rates of chronic diseases, focusing policies on providing treatment will not be able to deal with the problem over the long term.
- Dealing with the threat of chronic diseases will only be possible over the long term if we implement policies that are focused on prevention.
- This means analysing the upstream forces of the globally rising rates of chronic diseases.
- We know that chronic diseases are associated with economic development, which involves the flow of risk factors all over the world.
Upstream force: trade in risk factors
Trade of cigarettes out of and into the United States
**Upstream force: financial investment in risk factors**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Corporation</th>
<th>Home Economy</th>
<th>Foreign Assets (rank) (US$ billion)</th>
<th>Foreign Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food / Beverage</td>
<td>Hutchinson Whampoa Ltd</td>
<td>Hong Kong</td>
<td>40.9 (17)</td>
<td>53,478</td>
</tr>
<tr>
<td></td>
<td>Nestle SA</td>
<td>Switzerland</td>
<td>33.1 (21)</td>
<td>223,000</td>
</tr>
<tr>
<td></td>
<td>Unilever</td>
<td>UK/Netherlands</td>
<td>30.5 (25)</td>
<td>204,000</td>
</tr>
<tr>
<td></td>
<td>Diageo</td>
<td>UK</td>
<td>19.7 (47)</td>
<td>60,000</td>
</tr>
<tr>
<td></td>
<td>Proctor &amp; Gamble</td>
<td>USA</td>
<td>17.3 (58)</td>
<td>43,381</td>
</tr>
<tr>
<td></td>
<td>Coca-Cola Company</td>
<td>USA</td>
<td>17.1 (59)</td>
<td>26,000</td>
</tr>
<tr>
<td></td>
<td>McDonalds</td>
<td>USA</td>
<td>12.8 (79)</td>
<td>251,000</td>
</tr>
<tr>
<td></td>
<td>Danone Group SA</td>
<td>France</td>
<td>11.4 (86)</td>
<td>88,000</td>
</tr>
<tr>
<td>Retail (food &amp; drink)</td>
<td>Carrefour SA</td>
<td>France</td>
<td>29.3 (29)</td>
<td>235,894</td>
</tr>
<tr>
<td></td>
<td>Wal-Mart Stores</td>
<td>USA</td>
<td>26.3 (24)</td>
<td>303,000</td>
</tr>
<tr>
<td></td>
<td>Royal Ahold NV</td>
<td>Netherlands</td>
<td>19.9 (44)</td>
<td>183,851</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Diageo</td>
<td>UK</td>
<td>19.7 (47)</td>
<td>60,000</td>
</tr>
<tr>
<td>Tobacco</td>
<td>Philip Morris</td>
<td>USA</td>
<td>19.3 (49)</td>
<td>39,000</td>
</tr>
<tr>
<td></td>
<td>BAT</td>
<td>UK</td>
<td>10.4 (92)</td>
<td>59,000</td>
</tr>
</tbody>
</table>

11 automobile and 10 pharma companies are also amongst the top 100 TNCs.

*Source: UNCTAD, 2003*
Upstream forces: marketing of risk factors

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Chronic diseases: the long-term view
Upstream forces: urbanisation

Urbanisation: Estimated projected urban & rural populations in the world, 1950-2030

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Long-Term Policy Response

- Reorienting powerful upstream economic forces
Thank you