Economic Impact of Non-communicable Disease in the Caribbean

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The World Bank

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Outline of Presentation

1. Why focus on Non-communicable Diseases (NCDs)

2. Economic Implications of NCDs

3. Financing Strategies to address NCDs
• Why NCDs Matter

• NCDs are becoming chronic emergency in middle-income and low-income countries
• NCDs present a particularly daunting challenge for middle- and low-income countries because of the scale of the burden relative to their level of economic development.
Increase Burden of Diseases due to NCDs in Disability-adjusted life years (DALYs)

- Low-income countries: Projected NCD-related DALYs¹ (millions)
  - 2008: 288
  - 2030: 394
  - Change: +37%

- Middle-income countries: Projected NCD-related DALYs¹ (millions)
  - 2008: 358
  - 2030: 398
  - Change: +11%

- High-income countries: Projected NCD-related DALYs¹ (millions)
  - 2008: 104
  - 2030: 107
  - Change: +3%

¹ DALYs: Disability-adjusted life years.
Burden of NCDs in the Caribbean

- NCD deaths are 5 times of deaths from other diseases
- NCD deaths are 10 times of deaths from HIV/AIDS
- NCDs account for 65% burden of diseases
NCDs #1 KILLER IN AMERICAS REGION

- **Chronic respiratory disease**: 10%
- **Other NCDs**: 7%
- **Diabetes**: 8%
- **Cancer**: 30%
- **TOTAL NCD DEATHS 2009**: 4.5Millions

- **Cardiovascular diseases**: 45%

- 37% deaths are below age 70 years

- Approx 250,000,000 people live with an NCD in the Americas region

149 million smokers
30-40% of 25-64 hypertensive
25% persons >15 years old obese
Figure 2: Disability-adjusted life year ranks, top 25 causes, and percentage change in Latin America and Caribbean, 1990-2010

<table>
<thead>
<tr>
<th>Mean rank (95% UI)</th>
<th>Disorder</th>
<th>1990</th>
<th>2010</th>
<th>Disorder</th>
<th>Mean rank (95% UI)</th>
<th>% change (95% UI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 (1 to 2)</td>
<td>Diarrheal diseases</td>
<td>1.7 (1 to 3)</td>
<td>36 (32 to 41)</td>
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<tr>
<td>1.9 (1 to 2)</td>
<td>Lower respiratory infections</td>
<td>2.0 (1 to 7)</td>
<td>16 (13 to 21)</td>
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<tr>
<td>2.8 (3 to 3)</td>
<td>Preterm birth complications</td>
<td>2.8 (1 to 4)</td>
<td>35 (22 to 48)</td>
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<td>4.1 (4 to 5)</td>
<td>Ischemic heart disease</td>
<td>5.5 (3 to 8)</td>
<td>27 (11 to 36)</td>
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<tr>
<td>5.2 (4 to 8)</td>
<td>Interpersonal violence</td>
<td>5.7 (3 to 9)</td>
<td>40 (21 to 63)</td>
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<tr>
<td>6.5 (5 to 9)</td>
<td>Stroke</td>
<td>5.8 (3 to 10)</td>
<td>57 (40 to 75)</td>
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<td>7.5 (5 to 10)</td>
<td>Road injury</td>
<td>6.5 (4 to 8)</td>
<td>8 (4 to 25)</td>
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<tr>
<td>8.5 (5 to 7)</td>
<td>Lower respiratory infections</td>
<td>6.8 (5 to 9)</td>
<td>18 (5 to 46)</td>
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<tr>
<td>9.3 (6 to 12)</td>
<td>Major depressive disorder</td>
<td>8.5 (8 to 10)</td>
<td>50 (57 to 64)</td>
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<tr>
<td>9.9 (7 to 12)</td>
<td>Neonatal encephalopathy</td>
<td>10.0 (9 to 11)</td>
<td>82 (72 to 97)</td>
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<td>10.6 (6 to 13)</td>
<td>Iron-deficiency anemia</td>
<td>12.6 (10 to 22)</td>
<td>49 (57 to 64)</td>
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<tr>
<td>10.7 (6 to 13)</td>
<td>Low back pain</td>
<td>13.1 (11 to 17)</td>
<td>54 (38 to 59)</td>
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<td>13.5 (12 to 15)</td>
<td>Diabetes</td>
<td>15.2 (11 to 23)</td>
<td>94 (57 to 149)</td>
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<td>14.3 (13 to 16)</td>
<td>COPD</td>
<td>15.3 (10 to 22)</td>
<td>-21 (-29 to -15)</td>
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<tr>
<td>15.8 (12 to 20)</td>
<td>Cirrhosis</td>
<td>15.8 (12 to 20)</td>
<td>51 (38 to 59)</td>
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<td>16.5 (12 to 27)</td>
<td>Chronic kidney disease</td>
<td>16.2 (13 to 21)</td>
<td>140 (84 to 156)</td>
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<td>17.1 (14 to 20)</td>
<td>Other musculoskeletal</td>
<td>16.5 (13 to 20)</td>
<td>71 (60 to 85)</td>
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<td>18.7 (14 to 27)</td>
<td>Asthma</td>
<td>17.3 (11 to 24)</td>
<td>52 (35 to 71)</td>
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<td>18.8 (14 to 27)</td>
<td>Anxiety disorders</td>
<td>17.7 (11 to 24)</td>
<td>38 (15 to 65)</td>
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<tr>
<td>19.1 (14 to 27)</td>
<td>Alcohol use disorders</td>
<td>19.3 (16 to 23)</td>
<td>-78 (-81 to -75)</td>
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<td>20.8 (15 to 29)</td>
<td>Drug use disorders</td>
<td>20.7 (15 to 25)</td>
<td>-41 (-50 to -29)</td>
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<tr>
<td>21.7 (18 to 26)</td>
<td>Meningitis</td>
<td>22.5 (15 to 28)</td>
<td>50 (21 to 85)</td>
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<td>22.5 (19 to 27)</td>
<td>HIV/AIDS</td>
<td>23.0 (15 to 30)</td>
<td>10 (1 to 21)</td>
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<tr>
<td>23.2 (19 to 27)</td>
<td>Migraine</td>
<td>24.3 (18 to 30)</td>
<td>54 (29 to 84)</td>
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<td></td>
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<tr>
<td>24.8 (15 to 35)</td>
<td>Neonatal encephalopathy</td>
<td>25.0 (18 to 33)</td>
<td>45 (33 to 57)</td>
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</tbody>
</table>

- Communicable, newborn, nutritional, and maternal
- Non-communicable
- Injuries

--- Ascending order in rank
--- Descending order in rank

1. In 1990 Diarrheal Diseases ranked No. 1 and in 2010, it ranks No. 20.
2. In 1990 Forces of nature ranked No. 174 and in 2010, it ranks No. 2

Top 5 burden of diseases in 2010

1. Heat diseases
2. Forces of Nature
3. Violence
4. Road injury
5. Major depressive disorder
Jamaica: Trend of NCDs

Estimates 2008

Source: JSLC author calculation

Predicted prevalence controlled for key individual socioeconomic and demographic characteristics

%chronic illness

Year


female

male
<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nauru</td>
<td>82</td>
</tr>
<tr>
<td>2</td>
<td>Tonga</td>
<td>81</td>
</tr>
<tr>
<td>3</td>
<td>Micronesia</td>
<td>79</td>
</tr>
<tr>
<td>4</td>
<td>Cook Is.</td>
<td>73</td>
</tr>
<tr>
<td>5</td>
<td>Samoa</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>Niue</td>
<td>70</td>
</tr>
<tr>
<td>7</td>
<td>Kuwait</td>
<td>67</td>
</tr>
<tr>
<td>8</td>
<td>Barbados</td>
<td>63</td>
</tr>
<tr>
<td>9</td>
<td>Palau</td>
<td>62</td>
</tr>
<tr>
<td>10</td>
<td>Trinidad</td>
<td>61</td>
</tr>
<tr>
<td>11</td>
<td>Dominica</td>
<td>60</td>
</tr>
<tr>
<td>12</td>
<td>Egypt</td>
<td>59</td>
</tr>
<tr>
<td>13</td>
<td>USA</td>
<td>55</td>
</tr>
<tr>
<td>14</td>
<td>Jamaica</td>
<td>53</td>
</tr>
</tbody>
</table>
ADULT OVERWEIGHT/OBESITY TRENDS IN THE CARIBBEAN

The chart illustrates the trends in adult overweight/obesity across different decades (1970s, 1980s, 1990s, 2000s) for both males and females. The y-axis represents the percentage (%) of adults who are overweight or obese, while the x-axis shows the decades. The data shows a significant increase in obesity rates over the decades, particularly for females. Male obesity rates also show an upward trend but are generally lower than those of females.
Economic Implications of NCDs
Socioeconomic Impact of NCDs

Exhibit 4. NCDs have a significant impact on economies, health systems and households

**Key drivers**

**Economies**
- Reduced labor supply
- Reduced labor outputs (e.g., cost of absenteeism)
- Lower tax revenues
- Lower returns on human capital investments
- Increased public health and social welfare expenditures
- Cost to employers (e.g., productivity, health)

**Health systems**
- Increased consumption of NCD-related healthcare
- High medical treatment costs (per episode)
- Demand for more effective treatments (e.g., cost of technology and innovation)
- Health system adaptation needs and costs (e.g., organization, service delivery, financing)

**Households and individuals**
- Reduced well-being
- Increased disabilities and premature deaths
- Household income decrease, loss, or impoverishment
- Higher health expenditures, including catastrophic spending
- Savings and assets loss
- Reduced opportunities

**Key impact areas**

- Country productivity and competitiveness
- Fiscal pressures
- Health outcomes
- Poverty, inequity, and opportunity loss

Source: World Bank analysis by the authors
Fiscal Pressure of NCDs

- Lose tax revenue;
- Increase health and social protection expenditures;
- Reduce fiscal space;
- Limit governments’ ability to invest in economic development and general social welfare.
NCD Situation not Sustainable

- $47 trillion output lost globally in 20 years (75% of global GDP in 2010)
- $500 billion annually in LMICs = 4% GDP

World Economic Forum and the Harvard School of Public Health, 2011
Methodology to estimate NCD cost

Three distinct approaches are used to compute the economic burden:

(1) the standard cost of illness method;
(2) macroeconomic simulation and
(3) the value of a statistical life.

World Economic Forum and the Harvard School of Public Health, 2011
Examples of economic impact

• China: reducing cardiovascular mortality by 1% per year between 2010 and 2040 could generate an economic value equivalent to 68% of China’s real GDP in 2010 or over PPP US$10.7 trillion

• Egypt: NCDs could be leading to an overall production loss of 12% of Egypt’s GDP

• Brazil: costs of NCDs between 2005 and 2009 could equal 10% of Brazil’s 2003 GDP

• India: eliminating NCDs could have, in theory, increased India’s 2004 GDP by 4%-10%
Economic Burden to individuals have two components:

- **Direct** economic burden: at individual level is the sum of
  
  - (a) out-patients visits; (b) hospital stays, and (c) medication.

- **Indirect** economic burden of NCDs is from reduction of productivity due to illness.
Estimated Average Economic Burden Per Person with NCD in Jamaica 2008 is about J$70,000

- Indirect work loss: $15,912 (23%)
- Health practitioner visits: $15,236 (22%)
- Hospital stay: $13,581 (19%)
- Medicine/prescription purchase: $25,267 (36%)

Jamaica dollar
National Aggregate Economic Burden

National aggregate economic burdens by conditions, in J$M

Source: JSLC author calculation.
2008 Jamaica million Dollar
Economic Implication of NCDs

• Based on household survey data, NCDs economic burden accounted for **3% of Jamaica GDP** in 2008. This does not include government expenditure or insurance expenditure.

• Health expenditure on a diabetic patient ranges from **US$322 to US$769 per year** which is more than annual per capita spending for health in the six OECS countries.

• Data for Saint Lucia show that NCD patients **spend 36 percent of their annual household expenditures** on out-of-pocket healthcare costs for NCD care.
## Direct Cost of Diabetes & Hypertension

<table>
<thead>
<tr>
<th>Caribbean Countries</th>
<th>Total Cost (US$ M)</th>
<th>As % of Public Health Exp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guyana</td>
<td>74.5</td>
<td>211.3</td>
</tr>
<tr>
<td>Jamaica</td>
<td>289.0</td>
<td>175.3</td>
</tr>
<tr>
<td>Suriname</td>
<td>42.3</td>
<td>122.2</td>
</tr>
<tr>
<td>St Vincent &amp; Grenadines</td>
<td>12.2</td>
<td>83.0</td>
</tr>
<tr>
<td>Dominica</td>
<td>8.0</td>
<td>69.3</td>
</tr>
<tr>
<td>St Lucia</td>
<td>17.0</td>
<td>66.1</td>
</tr>
<tr>
<td>St Kitts &amp; Nevis</td>
<td>4.9</td>
<td>47.9</td>
</tr>
<tr>
<td>Belize</td>
<td>19.6</td>
<td>47.8</td>
</tr>
<tr>
<td>Trinidad &amp; Tobago</td>
<td>131.6</td>
<td>41.0</td>
</tr>
<tr>
<td>Barbados</td>
<td>38.1</td>
<td>31.6</td>
</tr>
<tr>
<td>Anguilla</td>
<td>1.6</td>
<td>30.5</td>
</tr>
<tr>
<td>Montserrat</td>
<td>1.1</td>
<td>27.2</td>
</tr>
<tr>
<td>Antigua/Barbuda</td>
<td>7.7</td>
<td>25.7</td>
</tr>
<tr>
<td>Grenada</td>
<td>6.0</td>
<td>25.5</td>
</tr>
<tr>
<td>BVI</td>
<td>2.6</td>
<td>18.4</td>
</tr>
<tr>
<td>Bahamas</td>
<td>34.8</td>
<td>17.6</td>
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Strategies to address NCDs
Challenges for Low and Middle Income countries

- Most countries lack the means to “treat their way out” of the NCD challenge.
- Rising trends in NCD prevalence and treatment costs will force countries to make deliberate, and often very difficult choices in creating strategies to address NCDs in a sustainable way.
- The strategy should strongly emphasize prevention, alongside efforts to provide effective treatment.
We can avoid 3 million deaths in 10 years in LAC

NCDs ARE HIGHLY PREVENTABLE

Reducing tobacco use by 20% + Lowering salt intake by 15% + Increase coverage of patients at high risk of Cardiovascular Diseases with simple drug regimen to 60% = 3.4 M deaths prevented in LAC in the next 10 years


The tobacco and salt intake interventions would be cost than US $ 0.40 per person/year in low and middle income countries, and US$ 0.50-1.00 in upper middle-income countries

Plus Education & Communication
<table>
<thead>
<tr>
<th>Condition</th>
<th>Interventions</th>
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<tbody>
<tr>
<td>Tobacco use</td>
<td>Tax increases; smoke-free indoor workplaces &amp; public places; health information / warnings; advertising/promotion bans</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>Tax increases; restrict retail access; advertising bans</td>
</tr>
<tr>
<td>Unhealthy diet &amp; physical inactivity</td>
<td>Reduced salt intake; replacement of trans fat; public awareness about diet &amp; physical activity</td>
</tr>
<tr>
<td>CVD &amp; diabetes</td>
<td>Counseling &amp; multi-drug therapy (including glycaemic control for diabetes) for people with &gt;30% CVD risk (including those with CVD); treatment of heart attacks with aspirin</td>
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<tr>
<td>Cancer</td>
<td>Hepatitis B immunization to prevent liver cancer; screening &amp; treatment of pre-cancerous lesions to prevent cervical cancer</td>
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Jamaica’s Response to NCDs

• **National Health Fund (NHF) created in 2003 using Taxation from tobacco.**
  - Individual Benefits:
    • **NHF Card**: Subsidizes drugs for all Jamaican residents with eligible NCDs
    • **JADEP Card**: The Jamaica Drug for the Elderly Program (JADEP) that provides drugs free of charge to residents age 60 and over who suffer from eligible diseases
  - Institutional Benefits:
    • **Health Promotion Fund**: finances public and private sector health promotion and disease prevention programs and spends at least 10 percent of the NHF revenues
    • **Health Support Fund**: assists the public agencies by financing the infrastructure development activities such as purchasing equipment and renovating, refurbishing and constructing health
Direct Healthcare Cost By Insurance

Source: JSLC author calculation. 2008
Jamaica dollar
Impact of NHF

Figure 1. Individual annual medical expenditures before and after NHF Program among NCD population (in 1000 2008 constant JMD)

- Richest 20%
- Poorest 20%
- 100% of Population

Medical service expenditure

Medicine and prescription drug expenditure

Comparison: 2006 and 2007 vs. 2000 and 2001
The Way Forward
Mitigate the impact of NCDs

• **On productivity and labor supply**
  – Targeted educational and worker training programs
  – Access to cost-effective NCD treatments
  – Develop employer-led disease management programs that help those with NCDs to continue working.

• **On competitiveness:**
  – High-level fiscal planning to avoid undue debt burdens, tax increases, and reductions to productive public investments.

• **On cost control:**
  – Improving prevention efforts
  – Leveraging existing communicable diseases management channels and community health worker schemes
  – Strengthening primary health care
  – Sharing resources – e-medicine
How to make UHC a Reality

• **Universal Health Coverage**
  – What services to be covered
  – How to finance them

• **Financing Strategy**
  – Caribbean Regional financing strategy?
  – Regional health fund or Regional health insurance?
  – Where are the funds from at the country level
    • Financing through sin taxation
    • Pay-roll taxation
    • General taxation
  – Private Sector (insurance vs. fee for serves)