Invaluable or Unaffordable? The Economics of Cardiovascular Prevention in Vulnerable Populations

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Source: Institute for Health Metrics and Evaluation
CV disease is a shared human experience—so why is it so hard to invest in prevention?
Myth #1

CV disease is a disease of the wealthy, affecting rich countries or rich people in LMICs.
Is CV disease a disease of rich countries?

Age-Standardized Death Rate from CV disease

Age Standardized Death Rate from CVD in 2015

Rich Countries

Poor Countries

Is CV disease a disease of rich people?

Estimated Age-Standardized Event Rate in the US (per 100,000)

<table>
<thead>
<tr>
<th></th>
<th>Low SES</th>
<th>High SES</th>
<th><strong>Excess Risk in Low SES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Myocardial Infarction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>361</td>
<td>191</td>
<td>170</td>
</tr>
<tr>
<td>Women</td>
<td>169</td>
<td>74</td>
<td>95</td>
</tr>
<tr>
<td><strong>Death from coronary heart disease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>142</td>
<td>83</td>
<td>58</td>
</tr>
<tr>
<td>Women</td>
<td>60</td>
<td>29</td>
<td>31</td>
</tr>
</tbody>
</table>

Source: Penko JP, Bibbins-Domingo K, et al. (unpublished), 2018
Is CV disease a disease of rich people in poor countries?

<table>
<thead>
<tr>
<th>Household Wealth</th>
<th>18-25</th>
<th>26-35</th>
<th>36-45</th>
<th>46-55</th>
<th>56-65</th>
<th>&gt;65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorer</td>
<td>9.3</td>
<td>14.4</td>
<td>23.7</td>
<td>33.7</td>
<td>45.0</td>
<td>51.8</td>
</tr>
<tr>
<td>Richer</td>
<td>9.4</td>
<td>16.0</td>
<td>25.5</td>
<td>38.0</td>
<td>47.2</td>
<td>54.8</td>
</tr>
</tbody>
</table>

Source: Gedsetzer P, et al. JAMA Intern Med, 2018
Fact #1

CV disease disproportionately affects LMICs, and within countries, often disproportionately affects low SES individuals.
Myth #2

By the time a country develops a substantial burden of CV disease, it should be able to invest its own money in prevention and treatment.

– Legacy of the theory of epidemiologic transitions
‘Misfinancing’ Global Health

Disability-adjusted life years (DALYs, millions) vs. Total disbursements ($, millions)

- HIV/AIDS
- Malaria
- Water and sanitation
- Maternal health
- Injury
- Child health (including vaccines)
- Tuberculosis
- Nutrition
- Polio
- Non-communicable diseases

Fact #2

LMICs already face a disproportionate burden of CV disease and are underfunded to combat them. Donor apathy costs lives.
Myth #3

Prevention makes economic sense only if it is “cost-saving.”
Health Care Costs – Popular Narrative

Cardiovascular Care Costs

- Heart attack
- Second heart attack
Health Care Costs – Popular Narrative

Cardiovascular Care Costs

- Investment in Prevention
- Savings

Year: 2018 to 2030
Health Care Costs – Reality
Health Care Costs – Reality

Investment in Prevention

Cardiovascular Care Costs

2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
Societal Costs

Total Costs

Productivity Losses
Societal Costs

Total Costs

Investment in Prevention

Productivity Losses

2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
Fact #3

- Commonly used strategies for CV prevention are cost-effective, and may be cost-saving if we consider productivity losses.

- But cost-saving is a very high bar that we do not apply to treatment options.
Myth #4

Investing in CV prevention is economically unattractive because returns on investment are delayed many decades.

- “Discounting” of future costs and savings is standard in cost-effectiveness analyses
- Tyranny of the political cycle
Effect of Smoke-free Policies on Community Risk of Acute MI at 12 months

<table>
<thead>
<tr>
<th>Study Name</th>
<th>ES (95% CI)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy (4 regions)</td>
<td>0.77 (0.74, 0.82)</td>
<td>10.77</td>
</tr>
<tr>
<td>Helena, MT</td>
<td>0.56 (0.20, 0.93)</td>
<td>0.25</td>
</tr>
<tr>
<td>Piedmont, Italy</td>
<td>0.83 (0.76, 0.92)</td>
<td>7.37</td>
</tr>
<tr>
<td>Scotland</td>
<td>0.81 (0.80, 0.84)</td>
<td>12.66</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>0.82 (0.76, 0.89)</td>
<td>8.57</td>
</tr>
<tr>
<td>Saskatoon, Canada</td>
<td>0.87 (0.84, 0.90)</td>
<td>12.02</td>
</tr>
<tr>
<td>Rome, Italy</td>
<td>0.89 (0.85, 0.93)</td>
<td>11.10</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.89 (0.81, 0.97)</td>
<td>7.73</td>
</tr>
<tr>
<td>Pueblo, CO (18 mos)</td>
<td>0.78 (0.68, 0.88)</td>
<td>5.64</td>
</tr>
<tr>
<td>New York State</td>
<td>0.89 (0.88, 0.89)</td>
<td>13.28</td>
</tr>
<tr>
<td>Bowling Green, OH</td>
<td>0.78 (0.71, 0.86)</td>
<td>7.14</td>
</tr>
<tr>
<td>Pueblo, CO (36 mos)</td>
<td>0.77 (0.64, 0.92)</td>
<td>3.48</td>
</tr>
<tr>
<td>Overall (I-squared = 89.1%, p = 0.000)</td>
<td>0.83 (0.80, 0.87)</td>
<td>100.00</td>
</tr>
</tbody>
</table>

NOTE: Weights are from random effects analysis

Source: Lightwood J, Glantz S. Circulation, 2009
Fact #4

Community-level returns on CV prevention often show up early (particularly in high-risk populations) and continue to accrue over time.
Myth #5

Because CV risk reflects personal choices, we need to change those behaviors one person at a time.
Behavioral Econ 101

- Price signals:
  - Soda Tax
  - Tobacco taxes

- Non-price signals:
  - Regulation
  - Collaboration

_Menos Sal, Mas Vida_
Fact #5

Although CV risk factors have a “behavioral” component, the choice architecture matters, and this is often easier to manipulate at scale than individual behavior.
**Bonus Myth**

CV prevention is most cost-effective when tailored to individual risk.

- Lipid and BP guidelines in the US
- Secondary prevention of coronary disease in Sub-Saharan Africa
Bonus Fact

Individual risk matters, but in settings with limited health infrastructure, policy interventions based on population risk will save lives in the intermediate term.

“Precision population health”
The Economic Case for Investing in CV prevention:

- CV disease affects rich & poor countries, and rich & poor individuals
- LMICs lack the resources to deal with the CV disease epidemic, and donor indifference is costing lives
- CV prevention is cost-effective, and cost-saving if we consider productivity losses in LMICs
- Returns on CV prevention may show up early in high-risk populations
- Policy nudges help alter population-level behavior
- Population-level strategies for CV prevention saves lives.
Gracias!

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