Developing a Price Tag for NCD Prevention:
Example Country Case Studies from NHLBI Centers of Excellence

July 20, 2011

Andrew Mirelman, MPH
Doctoral Candidate in International Health, Johns Hopkins
Bloomberg School of Public Health
“Each of the 11 Centers of Excellence collaborates with research institutions in developed countries to build research and training infrastructures and to conduct research to improve the prevention and management of chronic cardiovascular and lung diseases in their country.”

-http://www.nhlbi.nih.gov/about/globalhealth/
# United Health and NHLBI Collaborating Centers of Excellence

<table>
<thead>
<tr>
<th>Developing Country Partner</th>
<th>Developed Country Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina (IECS)</td>
<td>Tulane University</td>
</tr>
<tr>
<td>Bangladesh (ICDDR,B)</td>
<td>Johns Hopkins University</td>
</tr>
<tr>
<td>China (George Institute)</td>
<td>Duke University</td>
</tr>
<tr>
<td>Guatemala (INCAP)</td>
<td>Johns Hopkins University</td>
</tr>
<tr>
<td>India (Bangalore) (PHRI)</td>
<td>McMaster University</td>
</tr>
<tr>
<td>India (New Delhi) (PHFI)</td>
<td>Emory University</td>
</tr>
<tr>
<td>Kenya (Moi University)</td>
<td>Duke University</td>
</tr>
<tr>
<td>Peru (UPCH)</td>
<td>Johns Hopkins University</td>
</tr>
<tr>
<td>South Africa (Univ. Cape Town)</td>
<td>Harvard University</td>
</tr>
<tr>
<td>Tunisia (UHFH)</td>
<td>NHPI Helsinki, KTL, Finland</td>
</tr>
<tr>
<td>U.S.-Mexico Border (PAHO)</td>
<td>UTEP; Univ. of Arizona; WTD San Diego, CA</td>
</tr>
</tbody>
</table>
Primary Objective


   Capitalize on the resources available from the UH NHLBI Collaborating Centers of Excellence to develop a price tag for NCD prevention.

Secondary Objectives

2. Incorporate costing with Burden of Disease estimates to develop decision tools such as cost-effectiveness analysis and MCDA.
Why a Global NCD Price tag?

• Developing countries comprise 80% of total global NCD mortality burden.

• Previous global price tags: Child survival (UNICEF/WHO), vaccines (Gates), AIDS treatment (WHO), etc.

• Needed for global advocacy and agenda setting for UN meetings, International Donors, (Sub)National Governments for committing resources and assigning priorities.
Global NCD prevention price tag

What is it?
A cross-validation study of international cost and epidemiologic estimates for prevention of specific NCD diseases and risk factors against country-level data with interventions apportioned into population-based and individual-based prevention categories.

How do you do it?
• Costing: individual costs, program costs (population-based).
• Incremental approach: adding NCD programs to existing infrastructures.
• Ingredients approach: Similar to WHO CHOICE distinguishing resource use and unit prices.
• Country level validation of inputs.
Data

• **Default** values from international databases i.e. CRA / BOD program, WHO-CHOICE reference pricing, and MSH essential drug listings. WHO Global InfoBase.

• **Validation** Questionnaire developed and two-way conversation with country technical personnel.

• **Key Variables**
  – NCD risk factor prevalence,
  – Intervention coverage, and
  – Unit prices (drugs, health staff)

• **Demographic** projection estimates (focusing on the growth of the adult and elderly population).
Methods

• Health care cost of implementing public health programs.
• At risk population numbers calculated from prevalence estimates and multiplied by annual treatment costs.
• All cost estimates are presented in 2010 US$ using inflation adjustment.
• A yearly cost estimated is the final output.
Strengths

• Country-tailored inclusion of risk reduction approaches
• Continued validation based on country information
• Include measurement and empirical uncertainties (drug prices, epi info, compliance) included in a multivariate sensitivity analysis
• Demographic projections to demonstrate the effect of ageing populations
• Integration with burden of disease estimates.
• Integration with cost-effectiveness analysis estimates.
Limitations

• Ideal approach / professional standards based on existing public health programs and guidelines and (inter) national professional guidelines.

• Limited by lack of knowledge on certain issues: up-scaling economies, human resources availability, societal & health system barriers.

• Never enough data at country level.

• Ignores returns in terms of health and societal benefits of health expenditures.
Future Directions

• Case Study for Bangladesh.
• More comprehensive data for costing and burden of disease leading to cost-effectiveness estimates.
• Develop League table with preference (e.g. equity) weighting based on Multiple Criteria Decision Analysis (MCDA).
• Expand to more countries.
**Selected Risk Factors and Diseases**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>IHD</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>Stroke</td>
</tr>
<tr>
<td>Smoking</td>
<td>COPD</td>
</tr>
<tr>
<td>Pre-Diabetes</td>
<td>Diabetes Mellitus</td>
</tr>
</tbody>
</table>

*Risk Factors and Diseases selected based on data availability and relevance to total NCD burden.*
China Model Strengths

• Integration with the Chinese CDC, MoH, and others
• Multiple diseases and multiple risk factors analyzed.

China Model Outcomes

• Costs and effects (DALYs).
• Population and disease burden projections using demographic modeling.
• Price tag for prevention, ICERs, and uncertainty analysis.
Conclusions

• Provides advocacy for new collective bargaining & tendering mechanisms aimed at NCD’s.
• Utilize the institutions and resources from the NHLBI collaborating centers of excellence.
• Integrated modelling approach for costing, burden, and demographics.
• Work closely with country partners, providing evidence for policy and capacity building.
• Build in other priority setting techniques such as CEA and preference weighting.
Acknowledgments

Principal Investigator

• Louis Niessen MD, Reg PH, PhD (JHSPH ICDDR,B)

Collaborators

• Shiyong Wang, MD (World Bank)
• Tracey Perez Koehlmoos, PHD (ICDDR,B)