JOHNS HOPKINS
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Section C: Use of SMPH for Resource Allocation

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Use of SMPH for Resource Allocation

- Learning objectives
  - List criteria useful for deciding priorities in the health sector
  - Outline the technical criteria for deciding how to allocate resources in the health sector
  - List the main steps to obtain information to determine the healthy life lost in a population for purposes of resource allocation
  - List the main steps to decide the main health interventions to be implemented
  - Explain what would be needed to equilibrate health sector resource expenditures as compared to all other uses of resources

- References
  1. Newman, P., et al. *Measuring the value of public health systems.*
  2. Musgrove and Fox-Rushby. Cost-effectiveness analysis for priority setting. In *Disease control priorities in developing countries* (2nd ed.) *(DCPDC2).*

Use of SMPH for Decisions Concerning Resource Allocation

- Criteria for decisions about health priorities (after Musgrove, Fox-Rushby)
  - Cost-effectiveness
  - Cost matters by itself (affordability)
  - Capacity of beneficiaries to pay
  - Horizontal equity (equal Rx for equal disease state)
  - Vertical equity (priority for those worse off)
  - Adequacy of demand
  - Public attitudes and wants
  - A public good (two aspects: non-rival and non-excludable)
  - Yields substantial positive externalities

Use of SMPH for Decisions Concerning Resource Allocation

- Conflicts among these criteria priorities
  - Cost-effectiveness vs. horizontal equity
  - Cost-effectiveness vs. vertical equity

- Emphasis in *DCPDC2* is on value for money, not on who pays, and the following criteria may be less relevant for what to do:
  - Capacity of beneficiaries to pay
  - Adequacy of demand
  - Public attitudes and wants
  - A public good

- Yields substantial positive externalities (a very important issue in general but probably of limited direct relevance here)

Use of SMPH for Decisions Concerning Resource Allocation

- Decision making
  - Always a social-political process, not a mechanical undertaking
  - But can be aided by technical inputs

- Technical criteria for deciding resource allocation in the health sector
  - Maximize amount of healthy life per dollar (utilitarian), plus …
  - Ensure fair distribution of interventions (i.e., that no one is worse off—consistent with Rawls)

- Though decisions might be made using additional or other criteria such as those above, at least these consequences of decisions should be explicit

- Note: At this point would you be able to outline the data needed and the methods to be used to meet these technical criteria?

Efficiency: Measure Healthy Life Gained per Dollar

- A review

Lost due to disease/risk factors		Gained from interventions
⬇		⬇
Loss of healthy life		Reduce loss
⬇		⬇
Consequences of loss		Gain in healthy life
⬇		⬇
Costs of consequences	**vs.**	**Costs of interventions**
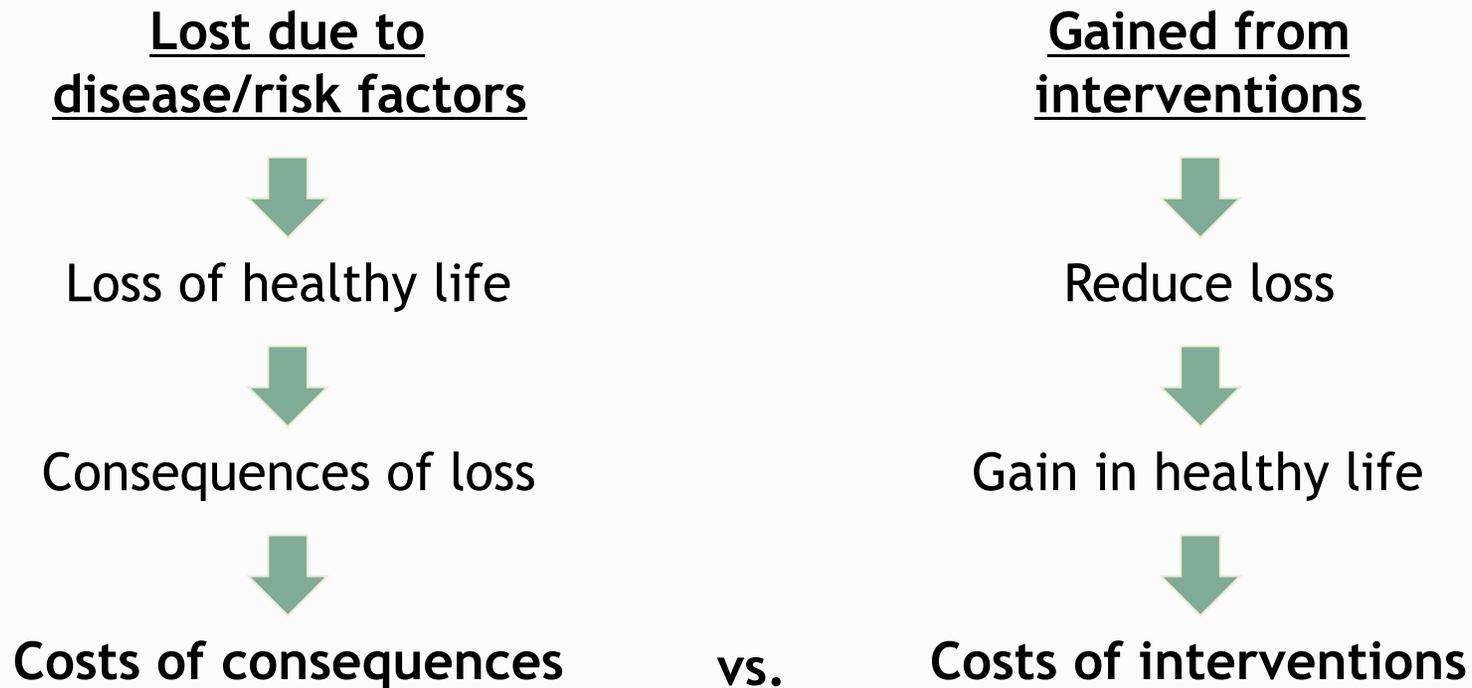
To Meet the Second Criterion: Ensure Fair Distribution

1. Assess and compare health status according to socio-economic and vulnerable (SE & V) groups

2. Assess and compare health interventions covered according to SE & V groups

3. With each planning cycle, plan such that no group will be no worse off—and/or, plan such that at least the worst off is somewhat improved

Measure Healthy Life-Lost

- SMPH
    1. Initiate a national burden of disease study and incorporate into the national, regional, and local health information systems
    2. Maintain continuity so that basic data is regularly updated
    3. Refine so that data is available according to SE & V group
    4. Monitor changes in the status of population health attributable to each intervention (and combinations) and according to SE & V groups

Measure Healthy Life Gained

- Interventions
  - Health programs and packages
    - ▶ Prevention of factors that initiate disease process
    - ▶ Reduction of risk factors
    - ▶ Treatment of ongoing processes
    - ▶ Rehabilitation and restoration
  - For these, usually gains and costs can be assigned to individuals and be subject to C-B/C-E analysis
  - Social programs and packages
    - ▶ Education and infrastructural development
    - ▶ Improved neighborhood conditions
    - ▶ Increased employment opportunities
    - ▶ Improved governance
  - Upstream factors that are determinants of health that cannot be assigned to individuals: these may not be subject to standard C-B/C-E analysis and would require multi-level analysis

Measure Healthy Life Gained from Interventions

- Factors of intervention to assess for health gains
  - Efficacy in an ideal setting (randomized trials plus …)
  - Coverage and factors that determine it—quality assurance/ improvement management
    - ▶ Provider factors
    - ▶ User factors
    - ▶ System factors
  - Effectiveness as used (community effectiveness)
    - ▶ Efficacy X coverage (planned)
    - ▶ Effectiveness X coverage (achieved)
  - Effects of interventions
    - ▶ Changes in health status attributable to each intervention and according to each SE & V group
  - Costs of interventions (note that this is a major undertaking with many controversial aspects, but not taken up in this course)
  - Cost-effectiveness ratios and the decisions to be made

Measure Costs of Interventions

- Factors of an intervention to assess for costs
    - Direct and indirect costs (for discussion)
    - ICER (incremental cost-effectiveness) vs. ACER (average C-E)
        - See Box 15.2 in the Musgrove Fox-Rushby chapter and Walker's lecture on advanced sensitivity analysis
    - Combinations of interventions and different methods of delivery
        - How to cost?
    - Quality improvement costs
    - Subsystem and infrastructural costs (training, supply systems, information systems, supervision, transport, communication, education …)
        - How to apportion these costs?
    - Meaningful cost units of an intervention (clinic visit, delivery, hospital day, operation, health education campaign, mosquito control …)
    - All cost factors must be put together to coincide with meaningful units of intervention using the same time and dimensional frames
    - Assessing comparability of costs may be a greater enigma than assessing comparability of healthy life gains

Costs of Intervention

- Issues in cost-effectiveness
  - Comparability of scope and time factors involved for both costs and interventions (almost always violated)
  - Same time and place frames for all alternative uses of resources in all sectors
  - To do this requires putting a dollar value on life—How to do that?
    1. Human capital approach
    2. The value of a statistical life (e.g., the VSL estimates ranged from $15,000 to $1,979,000 (1995 dollars), depending upon age (EPA, 1997)
    3. Willingness to pay (λ as WTP unit of effect = $450 as a ceiling mean GDP per capita for cost of a DALY from Walker)
    4. λ, as determined through the last choice to fund in a league table (cost-effectiveness acceptability curves—CEAC)

Costs of Disease: Three Views

1. Direct and indirect costs of disease (Dorothy Rice)
   - Direct cost = cost of treatment
   - Indirect cost = loss due to morbidity or mortality
   - So total cost of a disease = cost of treatment + cost of loss from illness and death from the disease

2. CEA (Gold at al.)
   - Cost of treatment/reduction of loss (effectiveness—also termed "time costs") from illness and death from the disease
   - Major issues of where to put time costs
     ▶ Monetary costs in numerator, *or*
     ▶ Decrements to utility in denominator

3. Burden of disease and its consequences—directly due to disability and death

   – Healthy lifetime lost per population per time period attributable to disease +/– what is done with that healthy life (social and economic productivity)

   <div align="center">vs.</div>

   – Cost of health interventions to reduce that loss

Issues and Critiques of Composite Measures of Healthy Life

- How much to put into health? How much is too much?
  - Willingness to pay? Alternatives?
  - As above, will need to attach a dollar value to human life—***but …***

- Comparative advantage is for use of HeaLYs/DALYs in developing countries rather than wealthy countries
  - Largely death
  - Small differences in disability not important

- Disability valuation

- Distortions resulting from cramming the many dimensions of health into a single number

- Misuse
  - Advocacy of particular problems
    - As with C-E analyses in general, it is inherently comparative and care must be taken of scope and time factors
  - Misunderstanding of the nature of SMPH (units of time)