Economic Evaluation Methods

D2P **Data to Policy**

Partial Economic Evaluation

Program-cost analysis

- This analysis assesses the resources required to implement an intervention and the costs associated with use of those resources.
- Estimating the total program cost is the first step in economic evaluation.
  - Resources = people, facilities, equipment, supplies, money, time, utilities, etc.
  - Costs = value of resources used to produce the goods or services.

Cost-of-illness analysis (COI)

- Cost-of-illness analysis estimates the economic burden of an illness, injury, or risk factor.
- This is measured as the total cost attributable to the outcome based on the perspective taken.
- Cost may include direct costs, productivity losses, and intangible costs of a disease or injury.
- For example, heart disease in the United States costs more than $321 billion each year—$193 billion in direct medical costs and $128 billion in lost productivity from premature death.[1]

Full Economic Evaluation

Cost-effectiveness analysis (CEA)

- CEA estimates the net costs and effects of an intervention, compared with an alternative (e.g., the baseline intervention or situation).
- Health outcomes are natural health units (e.g. life or death, breast cancer cases, asthma attacks, vaccinations received) and range from intermediate outcomes, such as measured reduction in blood pressure, to final outcomes, such as lives saved.
- The incremental cost-effectiveness ratio (ICER) is the difference in costs between two options (net costs) divided by the difference in health outcomes (net effectiveness); this analysis shows how much it costs to buy one additional unit of health.[2]
- For example, the ICER of a check-up program for adults with chronic substance abuse in Chicago is $23.38 per abstinent day (intermediate outcome) and $59.51 per reduced substance-related health problem (final outcome).[3]
- CEA is employed at the program level where a director may need to decide among a number of interventions with the same health outcome.

Cost-utility analysis (CUA)

- CUA is a specialized form of CEA that compares interventions with different health outcomes.
- CUA uses utility measures that combine length and quality of life. Measure examples include quality-adjusted life-years (QALY) and disability-adjusted life-years (DALY).
- DALY combines years of life lost and years lost due to disability. The CUA summary measure may be expressed in cost per QALY. [4,5]
- CUA is appropriate for use by ministries or agencies to allow decision-makers to decide among interventions with different health outcomes.

Cost-benefit analysis (CBA)

- Cost-benefit analysis (CBA) compares the costs and benefits of an intervention, where both are expressed in monetary units (e.g., U.S. dollars). CBA places a monetary value on health outcomes so that both costs and benefits are expressed in monetary units.
- Costs = money spent on implementing an intervention, decreased productivity, monetized value of health losses, etc.
- Benefits = saved medical expenses, productivity gains, monetized value of health improvements, etc.
- CBA provides the net benefits (benefits minus costs, discounted to present value) of an intervention.
- Positive net benefits mean benefits outweigh costs; negative net benefits mean costs exceed benefits.

Technical Notes

Cost-Effectiveness Thresholds: To assist in decision-making, ICERs should be compared to a cost-effectiveness threshold. However, due to an ongoing debate about thresholds and imposing limits on health care, we use CEA results to illustrate costs and health outcomes of selected interventions, and to inform our recommendations.

Discounting: Economic evaluation is concerned with costs and benefits that occur over time. But individuals and society prefer benefits received sooner rather than later, and likewise prefer to defer costs into the future. We must take this preference into account by discounting future costs and benefits. To discount future values, we use the Net Present Value (NPV) equation:

$$NPV = \sum_{t=0}^{n} \frac{(Benefits - Costs)_t}{(1+r)^t}$$

Where n=analytic horizon , t=year, Benefit$_t$=Benefits in year t, Cost$_t$=Cost in year t, and r = societal discount rate.

REFERENCES

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