Economic Evaluations in Public Health: What are the ethical implications?

Peel Public Health, Region of Peel, ON

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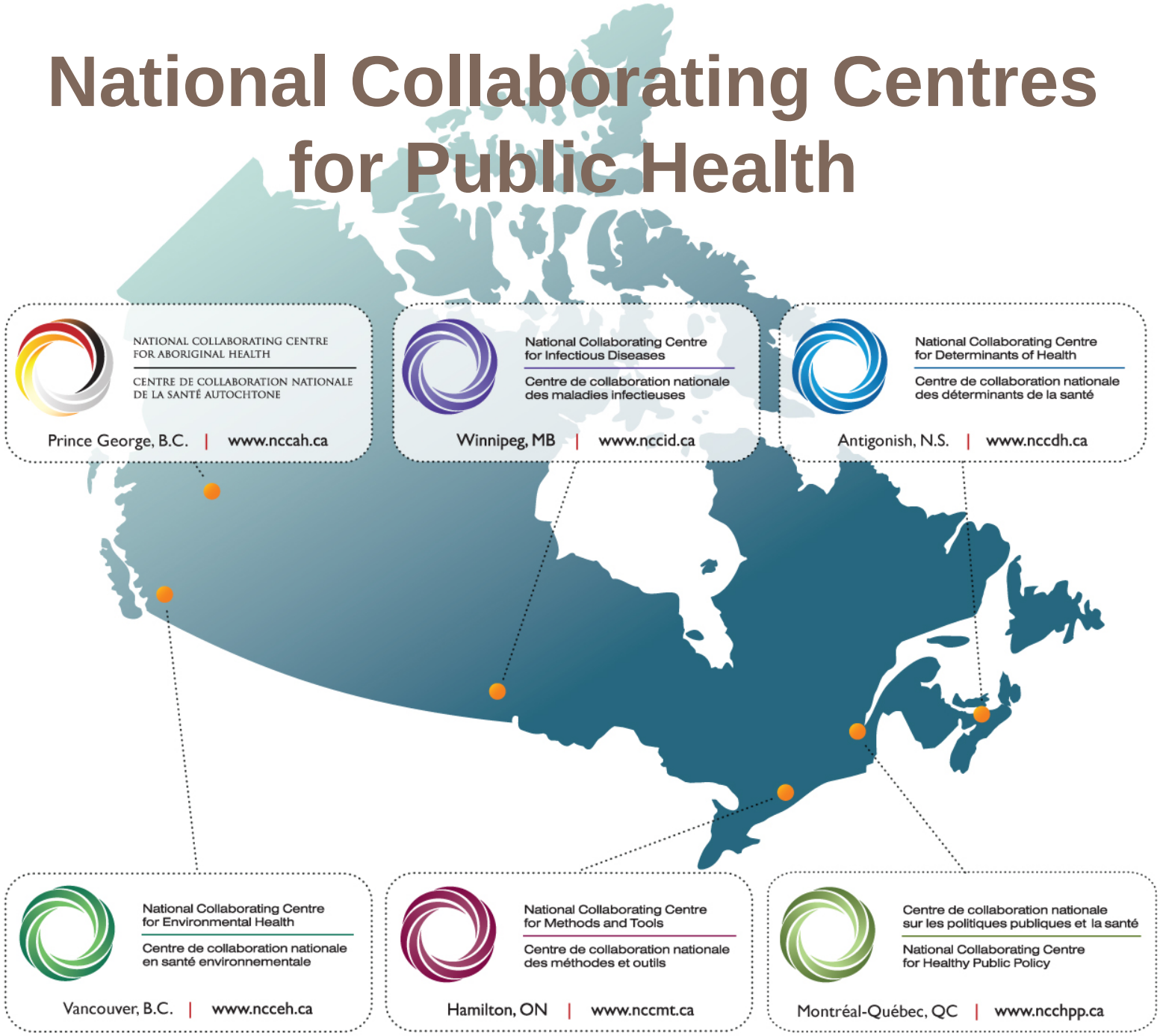
National Collaborating Centre for Healthy Public Policy (NCCHPP)

- Our mandate
  - Support public health actors in their efforts to promote healthy public policies

- Our areas of expertise
  - The effects of public policies on health
  - Generating and using knowledge about policies
  - Intersectoral actors and mechanisms
  - Strategies to influence policy making

National Collaborating Centres for Public Health



Economic evaluations and you?

You never encounter economic evaluations

You do economic evaluations

You react to others using economic evaluations

You use economic evaluations for advocacy/knowledge brokering

You use economic evaluations to decide which programs or interventions to fund

Workshop's objectives

- Raise awareness that economic evaluations are **not value neutral**
- Develop skills to critically analyze economic evaluations to identify the values they **implicitly** promote or downplay
- Start reflecting on ways to present the results of economic evaluations to decision makers that make these values **explicit** and relevant in a given context

Based on…

http://www.ncchpp.ca/144/Publications.ccnpps?id_article=962

Overview

1. What is an economic evaluation?
2. Cost-benefit and cost-utility analyses
3. Shared assumptions
4. Exercise
5. Conclusion and evaluation

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What is an economic evaluation? (1)

An **economic evaluation** looks at a single policy/intervention/program or a number of them with respect to economic efficiency

?

Effectiveness	Efficiency
Which intervention can achieve the most X?	…at the least possible cost?

Efficiency presupposes effectiveness

What is an economic evaluation? (1)

An **economic evaluation** looks at a single policy/intervention/program or a number of them with respect to economic efficiency

A ratio of costs to benefits, negative to positive effects

Effectiveness	Efficiency
Which intervention can best achieve X?	…at the least possible cost?

Efficiency presupposes effectiveness

Example: A social housing program

- **Results:** The average cost is $34,194 per household. The average change in health utility scores in the intervention group attributable to the intervention is +0.001 for all households. The estimate is statistically insignificant.

- **Conclusion:** At face value, the intervention is not value for money.

Adapted from: Lawson, K. D. et al. (2013). Investing in health: is social housing value for money? A cost-utility analysis. *Journal of Epidemiology and Community Health, 67*, 829-834.

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Not effective

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Not effective → Cannot be efficient

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What is an economic evaluation? (2)

To assess efficiency, we need to be able to directly compare costs and effects in the form of standardized units.

1. Identify

2. Value

Identify: Perspective matters

- Which costs and effects count?
  - Individual, administrative unit or social perspective
- Healthy public policy can be especially sensitive
- Example: bike lanes
  - Costs: Municipality
  - Benefits: Municipality, Health Ministry, Transportation Ministry, etc.

Source: wikimedia.commons.org
Photographer: Arne Hückelheim

Ethical implications:

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Cost-benefit analysis (CBA) 1

An example:

The addition of each supervised injection facility will prevent 11 cases of HIV and 65 cases of HCV each year. As a result, there is a net cost saving of CDN$0.686 million (HIV) and CDN$0.8 million (HCV) for each additional supervised injection site each year. This translates into a net benefit-cost ratio of 1.21: 1 for both HIV and HCV.

Everything is in $$$

- Market prices and *imputed* prices
- Are we measuring ability to pay?

Adapted from: Jozaghi, E. et al. (2013). A cost-benefit/cost-effectiveness analysis of proposed supervised injection facilities in Montreal, Canada. *Substance Abuse Treatment, Prevention, and Policy*, *8* (25), 1-8.

Cost-benefit analysis (CBA) 2

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1. Net present value (NPV)

   Benefits minus costs

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1. Net present value (NPV)

   Benefits minus costs

2. Ratio of benefit to cost

   More than 1 = value for money

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Cost-benefit analysis (CBA) 3

Strengths

- **Universal**: common language to compare very disparate things
- **Flexible**: can handle any kind of benefit

Limitations

- **Prices**: translating some benefits into dollars is difficult
- **Biases**: who and how do we ask about translating intangibles into dollars?

Ethical implications:

1. Is it the right perspective to capture relevant costs and benefits?
2. Are all relevant costs and benefits included?
3. Is the evaluation valuing things accurately or measuring ability-to-pay?

Cost-utility analysis (CUA) 1

An example:

Ontario's Universal Influenza Immunization Program costs approximately twice as much as a targeted program but reduces influenza cases by 61% and mortality by 28%, saving an estimated 1,134 QALYs per season overall. Reducing influenza cases decreases health care services cost by 52%. The incremental cost-effectiveness ratio is Can$10,797/QALY gained

Costs are in $$$

Benefits are in QALYs (Quality-Adjusted Life Years)

- 0 to 1 scale of general health
- Values come from questionnaires

Adapted from: Sander, B. et al. (2010). Economic Appraisal of Ontario's Universal Influenza Immunization Program: A Cost-Utility Analysis. *PLoS Medicine*, *7* (4), 1-11.

Ageism

QALY = number of years of life x quality of life

- As they age, people have:
  - Fewer years of life left
  - Years of decreasing quality

Age	QALY/year
Under 25 years	0.94
25-34	0.93
35-44	0.91
45-54	0.85
55-64	0.80
65-74	0.78
Over 74	0.73

- Saving a 20-year old (life exp. 82): 52.5 QALY
- Saving a 65-year old (life exp. 82): 12.9 QALY

$\Delta = 39.6$

Adapted from: *Peters, J. L. & Anderson, R.* (2013). The cost-effectiveness of mandatory 20 mph zones for the prevention of injuries. *Journal of Public Health*, *35* (1), 40-48.

Ethical implications:

1. Is it the right perspective to capture relevant costs and benefits?
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4. Is it fair that saving the life of an older person counts for less (ageism)?

Double Jeopardy

QALY = number of years of life x quality of life

- For an individual with a chronic condition or disability, each year of life is worth fewer QALYs

- Saving 20-year old w/o disability: 52.5 QALY
- Saving 20-year old w/ disability: 42 QALY

Δ = 10.5

Age	QALY/year	
	No disability	With disability (-20%)
Under 25 years	0.94	0.75
25-34	0.93	0.74
35-44	0.91	0.73
45-54	0.85	0.68
55-64	0.80	0.64
65-74	0.78	0.62
Over 74	0.73	0.58

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Cost-utility analysis (CUA) 2

Strengths

- **Comparability:** can compare health impact of interventions with differing aims
- **Focus** on broad measure of health: holistic but without $$$

Limitations

- **Bias: “**Ageism,” “Double Jeopardy”
- **Narrow:** do not capture benefits other than health-related

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6. Is it the right method to capture relevant costs and benefits (CUA & healthy public policies)?

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Methodological individualism

Methodological individualism assumes that all social phenomena can be explained with reference only to the actions and beliefs of individual human beings.

Do I prefer to pay taxes to fund a housing program or not?

Source: www.lumaxart.com

Do we prefer, as a society, to raise taxes to pay for a housing program or not?

Source: www.lumaxart.com

Methodological individualism

Methodological individualism assumes that all social phenomena can be explained with reference only to the actions and beliefs of individual human beings.

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- Harder to capture some social phenomena
- Tend to promote autonomy, individual liberty
- Can downplay solidarity, justice, equity

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7. Is the policy or program evaluated aiming at fostering or sustaining social phenomena?

Utilitarianism

The preference-satisfaction view:

The option that satisfies the most individual preferences is the better one, the right one.

- Maximizing the number of satisfied preferences
  - Not a specific distribution (inequity, inequality)
  - Not ranking preferences (wants/needs)
  - Not judging preferences (adaptation to a polluted area, acquired taste for fast food, etc.)

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10. Should some preferences be disregarded because they reproduce and reflect existing injustices (paternalism)?

Making values explicit

Individualism + Utilitarianism =

Ethical framework called Welfarism

- Value conflicts resolved within evaluations
  - Weights, etc.
  - Rarely done

- Also can be tackled during decision-making process
  - Making assumptions explicit
  - Cost-Consequence Analysis (CCA)
  - Multi-Criteria Decision Analysis (MCDA)

Questions?

Source: www.lumaxart.com

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Exercise

- Small group discussion to report back to larger group with 3 responses:
    1. How would you present the results of this economic evaluation **to a decision maker** in a way that takes into account the underlying ethical implications?
    2. Would your presentation change if the decision maker in question was working (A) in a **municipality**, (B) in a provincial **health authority** or (C) in a provincial **transportation authority**?
    3. Why?

The handout (1)

The problem: Casualties on local, residential streets

Two options:[1]

	Do nothing	Install 20-mph zones
Effects on casualties (effectiveness)	Fatal: -4.3%/year Serious: -7.9%/year Slight: -6.2%/year (Background trend)	Fatal: -57% for 10 years + -4.3%/year Serious: -26% for 10 years + -7.9%/year Slight: -22% for 10 years + -6.2%/year (Effects of the zones + background trend)

Source: www.flikr.com
Photographer: Pmcologic

Source: www.flickr.com
Photographer: Richard Drdul

The handout (2)

Two methods:

	Cost-utility analysis (CUA)	**Cost-benefit analysis (CBA)**
Recommended by	Health authority	Transportation authority
Perspective	Public service sector perspective	Societal perspective
Discount rate (costs and benefits)	3.5%	3.5%
Costs	**Cost of construction:** a little over $130,000/street km (total amount annuitized over 10 years at 1% interest rate) **Cost of maintenance:** $1,850/street km/year (arbitrary value)	**Cost of construction:** a little under $130,000/street km (total amount assumed to occur the first year) **Cost of maintenance:** $1,850/street km/year (arbitrary value)

(3)

	CUA	CBA
Benefits	**QALYs saved:** Fatal: 100% of the QALY (Quality-adjusted life year) value of each year of life saved Serious permanent[2]: 9.5% of the QALY value of each remaining year of life Serious short term[2]: 2.4% of the QALY value of the year following the injury avoided Slight: 1.5% of the QALY value of the year following the injury avoided (QALY value of one year of life by age: Under 25 yrs: 0.94; 25-34 yrs: 0.93; 35-44 yrs: 0.91; 45-54 yrs: 0.85; 55-64 yrs: 0.80; 65-74 yrs: 0.78; Over 74 yrs: 0.73 [i.e., one year of life is worth less QALY as you get older]) **Medical and police costs saved:** Fatal: $3,750 Serious permanent: $211,060 Serious short-term: $22,050 Slight: $2,450 (Beyond 18 months, medical cost saved is assumed to be $1850/year for serious permanent injuries.) QALYs implicitly account for benefits over time	**Societal costs saved:** Fatal: $3,163,930 Serious: $357,680 Slight: $27,580 (Includes: death, pain, suffering, medical costs and lost productivity due to casualties.) (Excludes: medical cost saved after 18 months in the case of permanent injuries avoided) Total benefits accounted for when casualty occurs
Cost-effectiveness measure	Incremental cost-effectiveness ratio (ICER): $/QALY (incremental cost / incr. QALY benefit)	Net present value (NPV): $ (incremental benefit - incr. Cost)
Efficiency threshold	$36,990 - $55,490 / QALY (U.-K.)	Over $0.

The handout (4)

Results:

	CUA	CBA
Low casualty area (mean: 0.6 cas. /km/ year)	$825,000 / QALY (Incremental cost: $123,750 Incremental benefit: 0.15 QALY)	NPV: -$46,990 (Incremental cost: $138,920 Incremental benefit: $91,930)
High casualty area (mean of 1.6 cas. /km/ year)	$163,350 / QALY (Incremental cost: $115,980 Incremental benefit: 0.71 QALY)	NPV: $167,590 (Incremental cost: $140,210 Incremental benefit: $307,800)

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Evaluation

- Please take 2 minutes to fill out the evaluation form.

THANKS!

Are you interested in this topic?

Visit us at **www.ncchpp.ca** for more resources

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