



Assessing the Challenges of Applying Standard Methods of Economic Evaluation to Public Health Interventions

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Components of the Project

- Review of the literature.
- Focus on four methodological challenges.
- Options for dealing with the challenges.
- Case studies.
- Recommendations and conclusions.

Analytical Challenges Posed by the Evaluation of Public Health Interventions

- Inter-sectoral effects.
- Estimates of relative treatment (programme) effects.
- Measurement and valuation of outcomes.
- Equity.

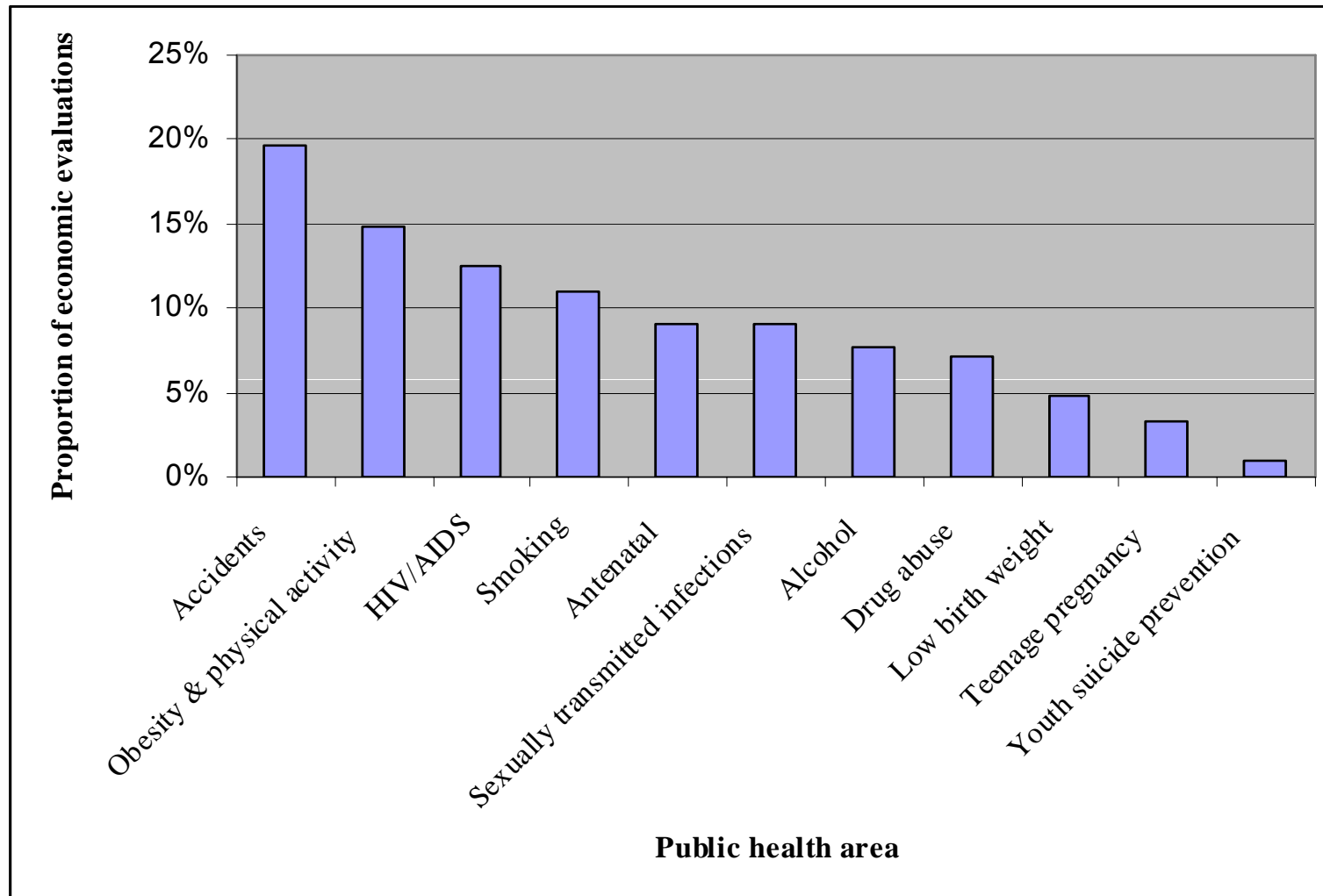
Literature Review Methods

- Searched NHS EED database
 - extensive coverage
 - easy access to abstracts
 - easy access to papers.
- Choosing Health, DH Public Health White Paper
 - Topics, n=11

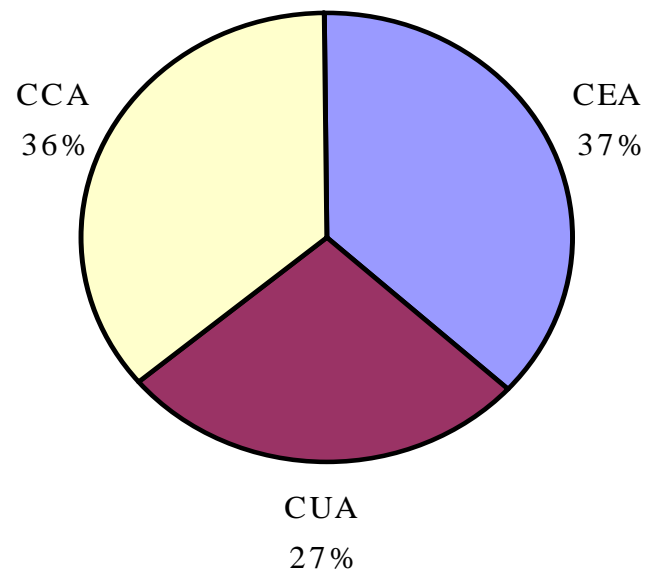
Records Retrieved

Public health area		Records retrieved	Records retained
1	Accidents	243	88
2	Obesity & Physical activity	121+217=338	27+26=53
3	Ante and post natal visiting	72	46
4	Sexually transmitted infections	56	46
5	Low birth weight	83	31
6	Smoking	90	29
7	HIV/Aids	225	27
8	Drug use	63	22
9	Alcohol	76	18
10	Teenage pregnancy	15	13
11	Youth suicide prevention	3	3
Total number of abstracts		1,264	376
Total number of unique abstracts			330
Total number of full economic evaluations			291
Total number of full economic evaluations of public health interventions			154

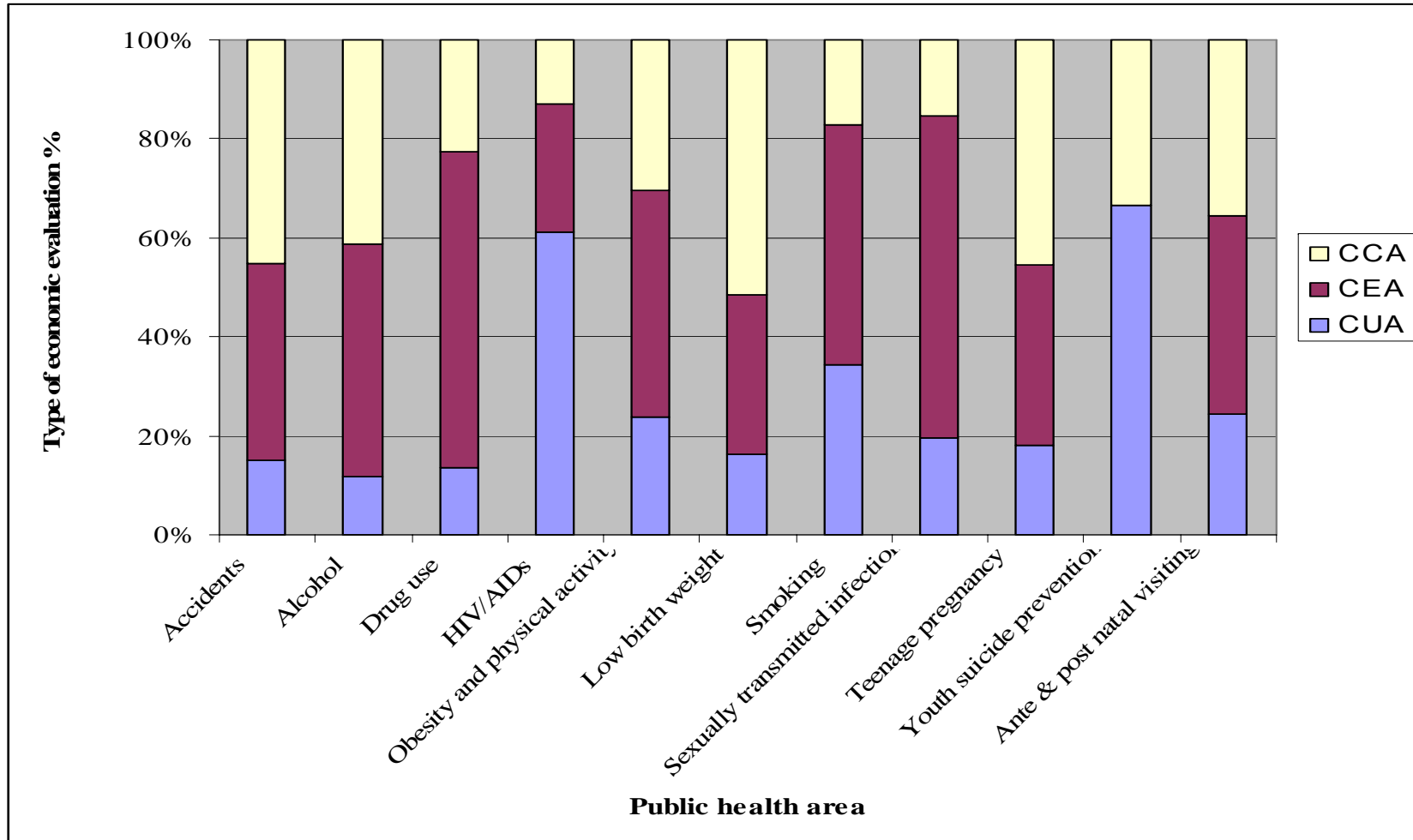
Public Health Areas



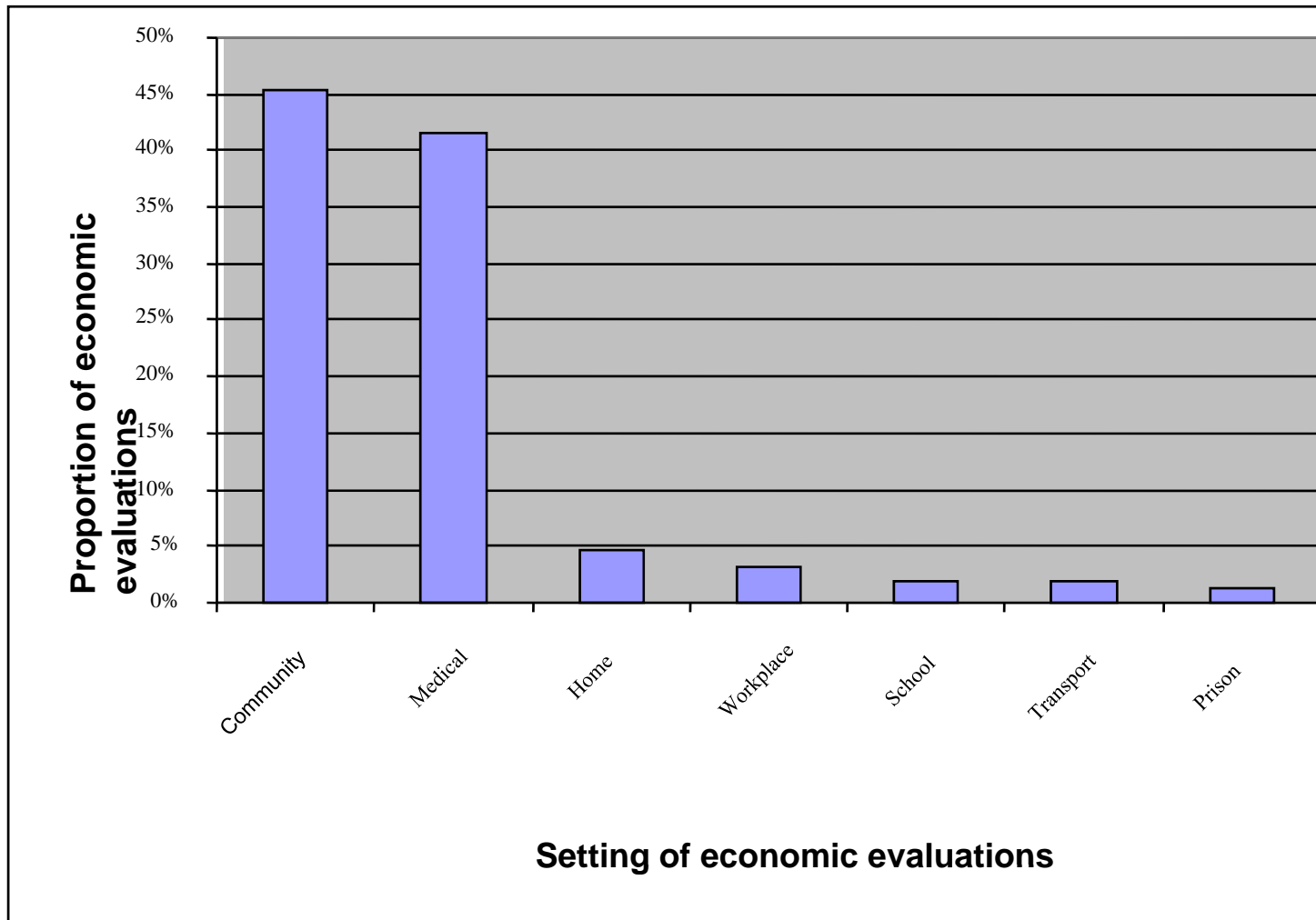
Types of Economic Evaluation



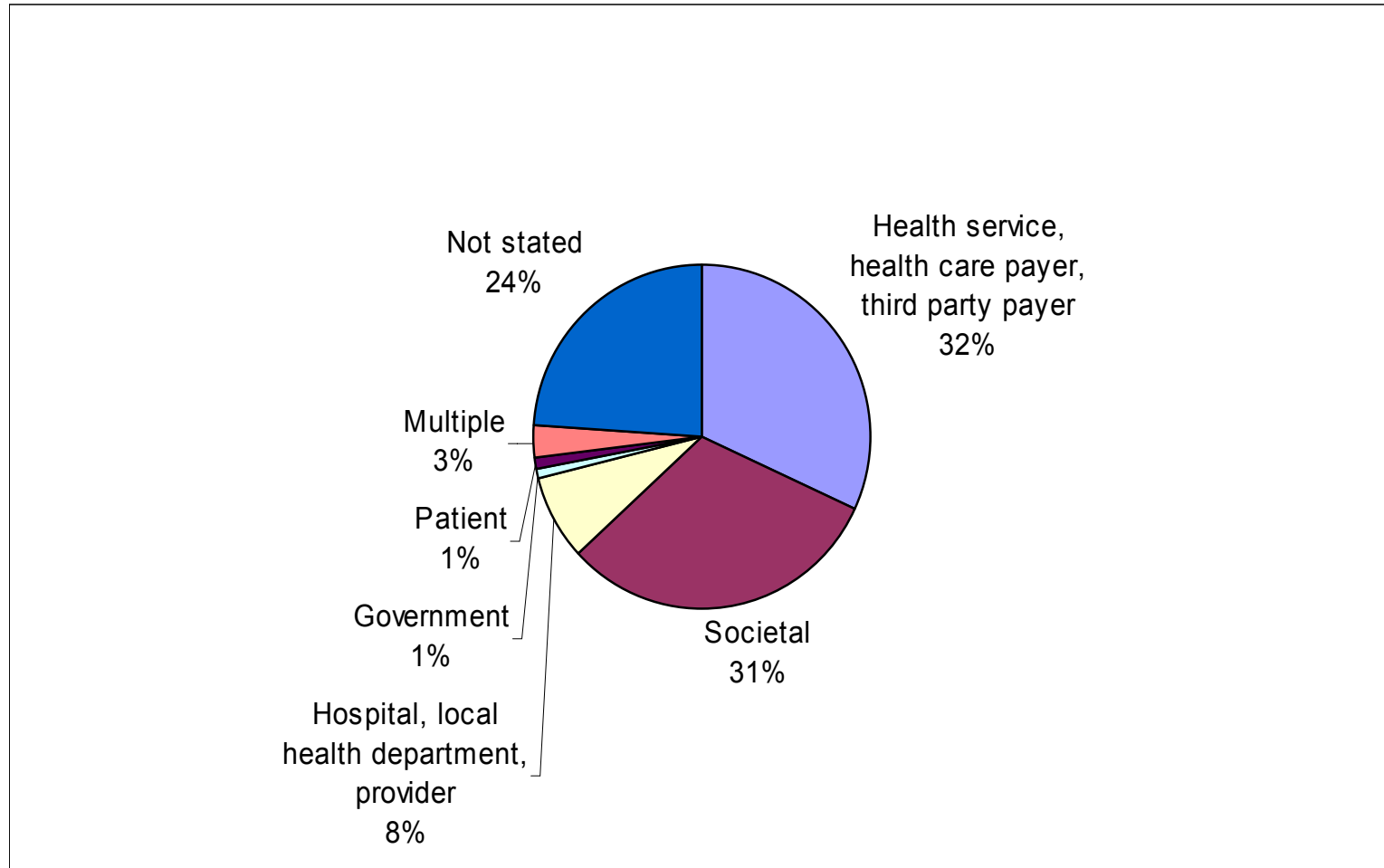
Economic Evaluation Type by Public Health Area



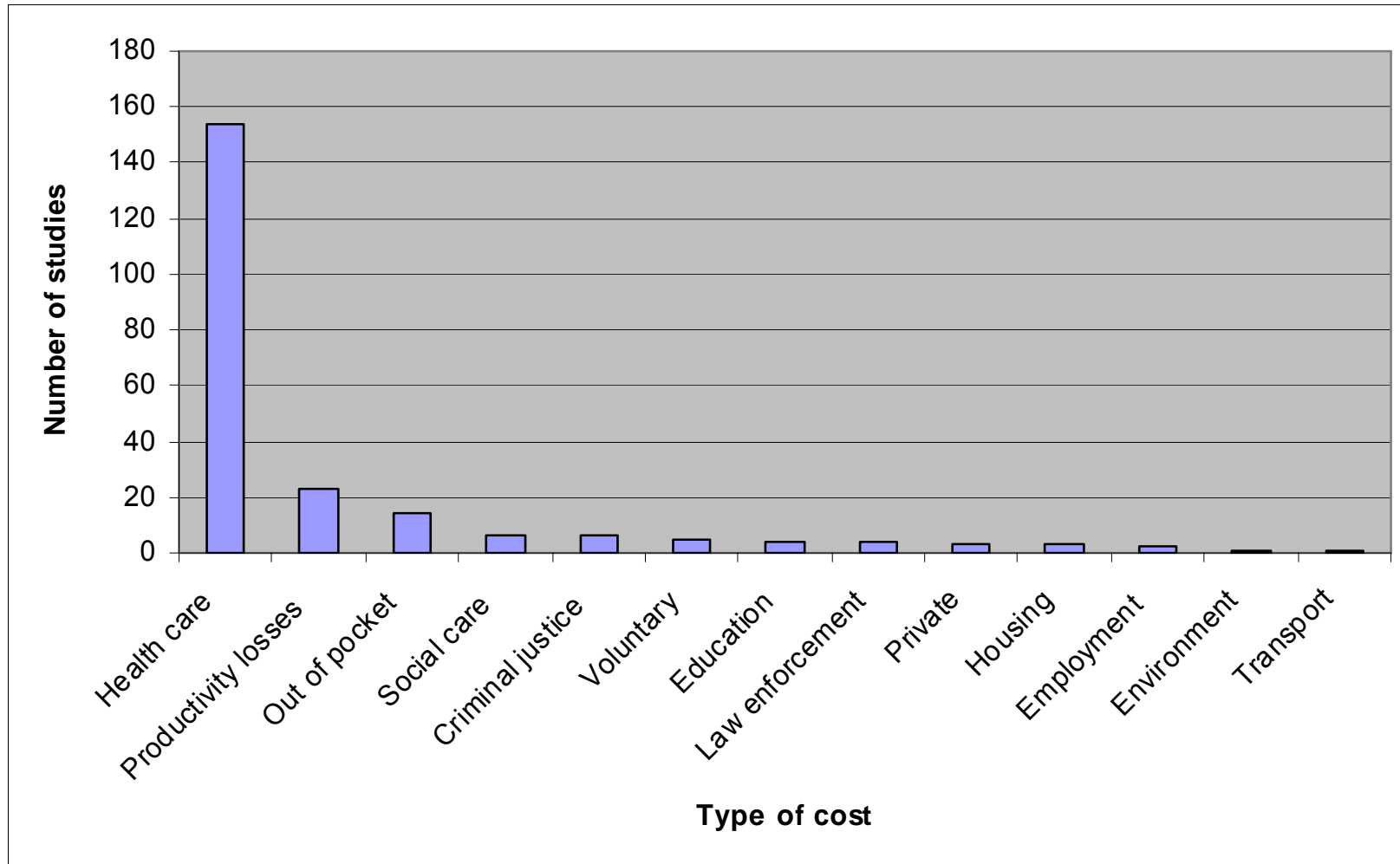
Economic Evaluation Setting



Study Perspective



Types of Costs



Estimate of Programme Effectiveness

SOURCES OF DATA

- Experimental studies, 27%
- Observational studies, 27%
- Reviews, 46%

INCORORATION OF MODEL

- Of the experimental studies above 13% included a model
- Observational studies, 22%
- Review, 89%

Inter-Sectoral Effects

- Current literature does not cast the net very broadly.
- Evaluations of PH interventions need to consider both public and private costs.
- Need to explore the 'ripple effects' (e.g. bicycle helmets).

Estimates of Relative Treatment (Programme) Effects

- Primary studies (e.g. potential for some RCTs).
- Data synthesis
 - modelling short to long-term
 - combination of effects from different designs
 - econometric modelling.

Measurement and Valuation of Outcomes

- Each method has its pros and cons.
- The options include:
 - money valuation
 - superQALY
 - cross-sectoral compensation test.

Equity Considerations

- Growing literature, although not generally applied in the context of economic evaluations.
- Methods for incorporating equity concerns:
 - discussion
 - distributional analysis (who gains/loses?)
 - opportunity cost analysis of equity
 - equity weighting analysis.

Case Studies

Case Study: WTP for use in a CBA

Shackley P, Dixon S. Using contingent valuation to elicit public preferences for water fluoridation. Applied Economics. 2000; 30,401-406

- **Overview:** Assessing dis/benefits to individuals of a water fluoridation programme. Community setting, UK
- **Attribution of effects:** Not applicable.
- **Measurement & valuation of outcomes:** Contingent valuation WTP survey to elicit public preferences for water fluoridation. Losers willingness to accept compensation for water fluoridation & losers willingness to pay to prevent their water being fluoridated. WTP for those favouring water fluoridation.

Case Study: WTP for use in a CBA

Shackley P, Dixon S. Using contingent valuation to elicit public preferences for water fluoridation. *Applied Economics*. 2000; 30,401-406

- **Equity considerations:** Not considered directly. Did undertake an income-stratified analysis. The respondents with higher incomes tended to have a higher WTP than respondents on low incomes.
- **Inter-sectoral costs and consequences:** Costs were not calculated. Perhaps there would be costs falling on the individual e.g. corrective dentistry, if adding fluoride to water causes discolouration of teeth.

Case Study: CEA

Kopjar B, Wickizer T. Age gradient in the cost-effectiveness of bicycle helmets. Preventive Medicine. 2000; 30,401-406

- **Overview:** Bicycle helmet vs. no use of bicycle helmet. Community setting, Norway
- **Attribution of effects:** Based on a review. Data from a national database & 4 case-control studies. Mathematical model.
- **Measurement & valuation of outcomes:** CEA undertaken. Measure of benefit used was head injury avoided in 3 to 70 year olds.

Case Study: CEA

Kopjar B, Wickizer T. (contd.)

- **Equity considerations:** Not considered directly. Did undertake an age-stratified analysis. The risk of head injury was highest among children aged 5 to 16. This translated into greater cost-effectiveness for the use of bicycle safety helmets in this age group, based on a greater risk reduction.
- **Inter-sectoral costs and consequences:** Health service perspective. Potential impacts omitted; disincentive to cycle and possible consequent reduction in health, costs to promote cycle helmet use & to advise people on correct fitting & use of them. Education costs.

Case Study: CCA

Brown. M. Costs & benefits of enforcing housing policies to prevent childhood lead poisoning. *Medical Decision Making*. 2002; 22: 482-492

- **Overview:** 2 housing policy strategies for the prevention of childhood lead contamination through the control & removal of lead paints.
Strict enforcement strategy vs. limited enforcement strategy. Community setting, U.S.
- **Attribution of effects:** Retrospective Cohort Study. Data from 2 adjacent areas in north-eastern U.S. Adjusted odds ratios calculated, controlling for potential individual & population based confounders e.g. number of preschool children, condition of exterior of the accommodation. Decision tree.

Case Study: CCA

Brown. M. Costs & benefits of enforcing housing policies to prevent childhood lead poisoning. *Medical Decision Making*. 2002; 22: 482-492

- **Measurement & valuation of outcomes:** CCA. Measure of benefit used was additional case/s of BPb of = or > 10 µgrams of at an address during 10 years following identification & referral for enforcement of housing code of a building where a child with BPb = or > 25 µgrams resided.
- **Equity considerations:** Not considered directly. Did mention time off school, education impacts & potential impact on long term occupational status.
- **Inter-sectoral costs and consequences:** Societal perspective. Considered health care costs (treatment & monitoring), special education costs due to BPb elevation & housing sector costs. Productivity losses based on human capital approach. Not all impacts considered e.g. possible impact on health care due to potential impact on birth outcomes & hypertension.

Recommendations

- Attribution of outcomes.
- Measuring and valuing outcomes.
- Equity considerations.
- Intersectoral costs and consequences.

Attribution of Outcomes

- Where possible, conduct RCTs.
- Try to match the outcomes in trials with those available in long-term observational studies.
- Where RCTs cannot be undertaken, fill gaps in the evidence base through natural experiments and non-experimental data.

Attribution of Outcomes (contd.)

- In economic evaluations synthesise all data, experimental and non-experimental. Conduct research into these methods (R).
- Make more use of techniques to analyse non-experimental data (e.g. propensity scores, time series analyses, more sophisticated econometric modelling).

Measuring and Valuing Outcomes

- Needs to be more debate about the theoretical and value propositions underlying the various forms of economic evaluation.
- Always perform a cost-consequences analysis, prior to proceeding to a valuation of outcomes.

Measuring and Valuing Outcomes (contd.)

- Explore the practicalities of applying the intersectoral compensation test approach (R).
- Continue research on developing a more general measure of well-being (R).

Equity Considerations

- Conduct pilot studies of health inequality impact assessment for selected public health interventions.
- Where the most cost-effective option is judged inequitable, calculate the opportunity cost of not selecting that option.
- Undertake primary research on the effectiveness of interventions designed to tackle health inequality (R).

Equity Considerations (contd.)

- Undertake further research on equity weighting, focussing on contexts relevant to public health (R).

Intersectoral Costs and Consequences

- Intersectoral impacts of interventions should be quantified (in a cost-consequences analysis). (Could assess the need for budgetary transfers.)
- Should be more consideration of the impacts of public health interventions on the voluntary sector and private individuals (re: impacts on the effectiveness of programmes, need for incentives).

Intersectoral Costs and Consequences (contd.)

- An analysis should be conducted of costs and consequences by beneficiary group (i.e. defined by health status, SES, etc).
- Should assess whether a general equilibrium approach would be more suitable for the evaluation of broad public health interventions (R).

Conclusions

- In principle the general methods of economic evaluation can be applied to public health interventions.
- The current literature is disappointing and represents many missed opportunities.
- Efforts need to be made in improving the effectiveness evidence base, through RCTs and observational studies.
- Economic evaluations in this area need to pay a lot more attention to intersectoral effects and equity considerations.