Economics in social care
NCCSCC interactive training
13th January 2014
Agenda

10.15-11.45am **Economic evaluation**
- Introduction to economic evaluation *Annette Bauer (PSSRU), Jen Francis (SCIE)*
- Decision modelling *Annette Bauer*

11.45-13.15pm **Outcomes in social care (for economic evaluation)**
- General part *Annette Bauer & Juliette Malley (PSSRU)*
- ASCOT *Juliette Malley*
- Questions & answers

**LUNCH** 13.15-2.00pm

2.00-2.30pm **Examples of economic evaluations**
- *Martin Knapp (PSSRU)*

2.30-4pm **Reviewing the literature – The NCCSC process**
- Introduction *Annette Bauer and Jen Francis*
- Working in groups
- Discussion
Introduction to economic evaluation
Why is economics relevant?

Relevance?

➔ Resources are **scarce** – so we have to think carefully about how we use them

➔ Outcomes are fundamentally important but also often rather elusive – so **what outcomes** are we trying to achieve?

➔ ... And **how best** can we achieve them?

And this scarcity and these issues are relevant across **all** social care (and wider) fields
When decision makers make choices

... they need to know ...

- what people need and what they want
- what services can meet those needs
- what staff and other inputs are employed to deliver those services
- what are the costs of employing them
- how to raise the funds to meet those costs

... and – importantly – also:

- what outcomes are achieved
- and whether those outcomes are worth the costs that is spent to produce them
Example: Treatment for depression

Interventions
- Antidepressant medication
- CBT
- Primary care counselling
- Interpersonal psychotherapy
- Couple therapy

Outcomes
- Symptom alleviation
- Interpersonal functioning
- Social functioning
- Employment
- Quality of life

Cost savings
- Lower use of health and social care services
- Fewer out-of-pocket expenses
- Greater economic productivity
- Higher income
1. Efficacy vs effectiveness vs efficiency.
2. Intermediate versus final outcome.
3. Sources of data for economic evaluation (-> modelling).
Efficacy = measure of effect under ideal conditions.

Effectiveness = effect under real life conditions.

**Efficacy does not imply** effectiveness.

Efficiency = relationship between costs & benefits.

**Effectiveness does not imply** efficiency.
Interventions for most social care and health needs are labour-intensive, and so _____

Interventions are complicated by multiple needs (co-morbidities): costs hard to ___

Costs can also fall to other services or service sectors

Users themselves may bear some of the costs ...

... and so do families (particularly the opportunity costs of ) and communities

Costs can persist for long periods

And many costs are from view
Rapidly growing numbers of older people with long-term needs ... whose care could be seen as ‘unaffordable’
Affordable solutions are needed for the future!

ECFIN report, Brussels 2009
<table>
<thead>
<tr>
<th>Quality of:</th>
<th>Respectful of / responsive to:</th>
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</thead>
<tbody>
<tr>
<td>o service / provision</td>
<td>o rights</td>
</tr>
<tr>
<td>o care and support</td>
<td>o dignity</td>
</tr>
<tr>
<td><strong>Effectiveness</strong> in:</td>
<td>o culture</td>
</tr>
<tr>
<td>o preventing needs or problems</td>
<td>o individuality</td>
</tr>
<tr>
<td>o meeting needs</td>
<td>o vulnerability</td>
</tr>
<tr>
<td>o meeting preferences</td>
<td><strong>Economically:</strong></td>
</tr>
<tr>
<td><strong>Equity / fairness</strong> in:</td>
<td>o Affordability</td>
</tr>
<tr>
<td>o access</td>
<td>o Sustainability</td>
</tr>
<tr>
<td>o payment</td>
<td>o Cost-effectiveness</td>
</tr>
<tr>
<td>o outcomes</td>
<td></td>
</tr>
</tbody>
</table>
Many causes; widespread impacts

Long-term needs

- Health care
- Social care
- Housing
- Education
- Crim justice
- Benefits
- Employment
- Vol sector
- Income
- Mortality

Genes
Family
Income
Empty’t
Resilience
Trauma
Phys env
Events
Chance
...on many different budgets (England)

Genes
Family
Income
Empty’t
Resilience
Trauma
Phys env
Events
Chance

Long-term needs

Health care
Social care
Housing
Education
Crim justice
Benefits
Employment
Vol sector
Income
Mortality

NHS
LAs CLG
DfE
MoJ
DWP
Firms
CVOs
Indiv
All
Cost-effectiveness: what does it mean?

If the policy/practice question is:

‘Does this intervention work?’

Then the economic question is:

Which then usually requires difficult and maybe controversial trade-offs.
Imagine that you have an idea for a new service (call it ‘Service 2’)

You want to sell/recommend it so that it replaces today’s usual service (call it ‘Service 1’)

The decision-maker has a limited budget. What will s/he want to know before deciding whether to purchase the new service?
Is it more cost-effective?

Service 2

**Effects** - on a user’s needs, social functioning, quality of life

Service 1

**Effects** - on a user’s needs, social functioning, quality of life

Service 2

**Costs** - cost of the service, costs of other services used, effect on employment

Service 1

**Costs** - cost of the service, costs of other services used, effect on employment

An economic evaluation needs all 4 elements
Possible CEA results

\[ C_2 > C_1 \]

New service less effective and more costly

\[ E_2 < E_1 \]

New service less effective but less costly

\[ C_2 < C_1 \]

New service more effective and also less costly

\[ E_2 > E_1 \]

New service more effective but also more costly

\[ C = \text{costs} \]
\[ E = \text{effects} \]
\[ 1 = \text{old service} \]
\[ 2 = \text{new service} \]
Possible CEA results

C = costs
E = effects
1 = old service
2 = new service

C_2 > C_1
E_2 < E_1
E_2 > E_1
C_2 < C_1
If you are trying to sell Service 2 ...

How are the outcomes traded-off against the costs?

How are the costs traded-off against the outcomes?
Trade-offs ... is it worth it?

If an intervention is more effective and also more costly, then calculate the cost per unit gain in effectiveness.

So we first need to calculate the cost-effectiveness ratio, which is ...

\[
\text{ICER} = \frac{(C_2 - C_1)}{(E_2 - E_1)}
\]

= the cost of achieving an incremental improvement in an outcome measure
Trade-offs ... is it worth it?

With the ICER we then have the following options:

- Show the decision-maker the cost-effectiveness of different ways to spend their money and get them to choose
- Or ask them how much they are willing to pay
- Or set a threshold, rigidly or as a guide (cf. NICE)

But then we need some way to compare across different ‘areas’ (e.g. across different need groups)

- Hence QALYs in health; and ASCOT in social care.
Types of economic evaluations

**Cost-effectiveness**: consequences measured using a single outcome in natural units e.g. life years gained

**Cost-utility**: consequences measured using a single outcome in terms of utility e.g. QALY (in health care) and social care QALY

**Cost-consequences**: consequences measured using multiple outcomes, one by one

**Cost-benefit**: consequences measured in £ i.e. assigning £ values to outcomes
Evaluations – differences in scope

- **CEA**
  - Compare treatment models for one ‘need group’ only → so ... fine for clinicians and others making *case-level* decisions

- **CUA**
  - Compare treatment models across the whole system → so ... needed by *strategic health* bodies, ministries of Health

- **CBA**
  - Compare resource use across the whole economy → so needed by governments for *macro/national* decisions
To choose: The perspective of the economic evaluation

‘Individual’: often includes not only service user but other people who are affected such as carers or parents

Public sector – Social care (adult, children), NHS, possibly other services and sectors affected such criminal justice, education and housing

Societal – Aggregation of the above perspectives
## Impact of choosing a perspective on costs

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Social services, NHS</th>
<th>Transfer payment</th>
<th>Morbidity</th>
<th>Mortality</th>
<th>Informal care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector</td>
<td>Covered costs</td>
<td>Yes, attributabl e to social condition</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>‘Individual’ (family, cares)</td>
<td>Out-of-pocket costs</td>
<td>Yes, amount received</td>
<td>Yes, Lost wages or household production (and opportunity costs of formal care)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Societal</td>
<td>All</td>
<td>No, only shift in resources</td>
<td>All</td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>
Limitations of EE in social care

• A wide range of perspectives
• Multiple outcomes, some long-term ones and those difficult to quantify or express in monetary form
• Difficulty to define routine care
• Difficult to establish causalities
• Resource implications for other parts in the system, often savings for other public services such as health, education or criminal justice
• Knock-on effects are typical for social care interventions but difficult to capture
• Methods still underdeveloped
• Information from a diverse range of studies need to be utilised to populate the model
Decision modelling
Advantages of this method are that it allows

- To use synthesised data,
- To combine different sets of evidence,
- To link intermediate to final outcomes and
- To extrapolate beyond the observed time period.

A method that can combat some of the challenges of trial-based economic evaluations

Instead of collecting new data over time ...

1. Use previous studies and routine data collections to simulate the impacts of an intervention.
2. Trace ‘pathways’ through a care system or a life-course
3. Estimate the associated outcomes and costs

3 Steps
**Simple decision tree**: suitable to model a limited number of events which happen in a short time period with no continuous risk (= follow-on events)

**Parameters:**
- Probability of fall for an ‘average’ person who received/did not receive falls prevention
- Cost of the falls prevention intervention
- Consequences: Quality-of-life, resource implications of a fall (e.g. average cost of treating a fall)
Decision tree

State transition model (>Markov):

- Represent continuous risk in the form of repeating events over a long time horizon
- Events are modelled as transitions from one state to another

Parameters:

- Transition probabilities
- Cost of the intervention
- Consequences: e.g. quality-of-life associated with death, hospitalisation, care home admission; resource implications linked to these events
Model parameters

Effects of intervention and routine care
- From studies with comparison group or - if not available - from information about likely effect in routine care

Willingness-to-pay

Resource use

Unit costs

Cost of interventions (or - if not available - descriptions of interventions)

Sociological data
Outcomes in social care
Social care is ‘different’

- Personal services for often very vulnerable people
- ... many with multiple needs
- ... and so they have above-average use of: health care, housing support, welfare benefits, etc
- Strong association between need and low socioeconomic position
- Stigma
- Some care is compulsory
- Some users have difficulty or reluctance expressing their preferences, so ‘consumer power’ has been weak

- Interventions mainly address the consequences and not the causes of need
- Interventions are quite simple technologically
- BUT most social care is relational – the quality of the link between carer and user is crucially important.
- Many social care jobs are low-skill, low-status, low-paid
- Historically important roles for non-state sectors ...
- ... and for private finance, whether out-of-pocket or through some other route.
Intermediate vs. final outcome measures

In Health

=? \text{ = change in health (status) resulting from the intervention.}

=? \text{ = change in clinical indicator resulting from the intervention.}

Aim is to establish = between intermediate and final outcome measure.
Examples of Intermediate vs. final outcome measures

In *Health*

- Quality adjusted life years gained
- Number surviving

Number who
- Walk a specified distance,
- Have specified grip strength,
- Achieve target blood pressure,
- Etc.
Additional challenges in social care

- Multiple outcomes (e.g. dignity, safety, mental wellbeing, physical health, choice and control);
- Not always set out at beginning of an intervention what the outcome should be (personalised, process oriented);
- Multiple needs & different groups of individuals who may benefit (e.g. service user, carer, family, wider community);
- Long-term outcomes and knock-on effects which will not be observed in the study period.
Which of the following are outcomes?

- Time spent by nurse to provide care
- Staff qualifications
- Cleanliness of the service
- Equity
- Improved confidence
- Control over daily living
- Quality of care
- Quality of life
Choosing outcomes for model-based economic evaluation

Outcomes analysed as part of economic work

For economic analysis outcomes **must be:**
- Individual-level
- Quantified/quantifiable

In addition, they **may need to be:**
- Standardised
- Final
- Linked to willingness-to-pay threshold
- ‘Monetisable’
Some examples

1. Adult Social Care Outcomes Tool (ASCOT): Measures social care related quality-of-life; comprehensive but not always available from study data;
2. Quality-adjusted life years (QALY): Measures quality and quantity of life; has advantage that NICE threshold exists to make decision about cost-effectiveness; limited usefulness in social care;
3. Mortality; often not observed in study period; but extrapolation possible with decision modelling;
4. Independent living at home; measured through period of additional time lived at home and delay into residential care;
5. Reduction in hospital (re-)admission; more a ‘cost’ than an outcome but in some areas studies use it as primary outcomes;
6. Intermediate outcomes that can be linked to final outcomes (e.g. social isolation, satisfaction, breakdown in carer’s relationship, educational achievement).
What kind of outcome/measure-s?

Consider if study measures/uses:
• Outcomes (rather than outputs)?
• Quantified or quantifiable (versus qualitative) outcomes?
• Standardised outcome measures?
• Outcomes at baseline?
• Adverse outcomes?

To address the issue of multiple outcomes in evidence synthesis:
• Consider summarizing single outcome measures to areas of outcomes
• Selecting outcomes (possibly only one) for use in the economic analysis
Problems using outcomes measures

ATTRIBUTION

(or demonstrating that the outcome measure reflects the impact of services rather than anything else)
A range of factors influencing the outcome

Characteristics of the person

Environment

Formal care and support services

(Informal) care and support network
Dealing with the attribution problem

**Measure**
- Difficult to identify
- Problem not resolved or quantified

**Method**
- Randomised control trial
- Not always appropriate
- Ethical, practical and financial challenges

**Analysis**
- Complex and relies on good data
- Quantifies problem, but some uncertainty remains
Reviewing the literature – The NCCSC process
Three key study types...

1. Full economic evaluations i.e. comparison between cost and outcomes for an interventions vs. control (usually trial based)

2. Partial economic evaluations e.g. cost analysis, cost-outcome descriptions;

3. Systematic reviews of the effects of ‘interventions’ and (if this is not available) studies.
... of which often there will not be many in social care, and WHAT to do THEN?
<table>
<thead>
<tr>
<th>Name</th>
<th>Details</th>
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<tbody>
<tr>
<td>Cost effectiveness</td>
<td>Trial based i.e. cost information are collected alongside trial; resource information collected via service use questionnaire (e.g. the CSRI) and intervention cost via diaries; results for example in costs per life year gained</td>
</tr>
<tr>
<td>Cost utility</td>
<td>As above but outcome measure will be a quality of life measure such as EQ-5D, SF-36, WHO –QoL, (~ASCOT)</td>
</tr>
<tr>
<td>Cost benefit</td>
<td>Often used for service evaluations, might use information from case management system, local NHS or Council (budget) data, national/regional survey data</td>
</tr>
<tr>
<td>Social Return on Investment</td>
<td>As above; typically uses a wide range of sources including information about happiness, sustainability, wellbeing, community</td>
</tr>
<tr>
<td>Cost consequences</td>
<td>Often trial based, see Cost effectiveness</td>
</tr>
<tr>
<td>Decision modelling</td>
<td>Any of the above use, uses longitudinal data, may be called: decision modelling, model-based, Markov Model, modelling pathways</td>
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# Economic evaluation studies - Partial

<table>
<thead>
<tr>
<th>Name</th>
<th>Details</th>
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<tbody>
<tr>
<td>Cost savings</td>
<td>Similar to cost benefit but outcomes are not captured</td>
</tr>
<tr>
<td>Cost analysis</td>
<td>Cost of a condition over a year or life-time are calculated; information may be taken from routine data, case studies or (published) trials; service use data, labour, quality of life</td>
</tr>
<tr>
<td>Single effectiveness studies</td>
<td>Intervention studies with quantitative outcomes, including follow-up studies of those</td>
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</table>
## Studies relevant for decision modelling

<table>
<thead>
<tr>
<th>Topic</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Cost relevant</td>
<td></td>
</tr>
<tr>
<td>Funding, paying for care</td>
<td>Includes information about publicly and privately funded services, out-of-pocket payments, fees, willingness or ability to pay</td>
</tr>
<tr>
<td>Caregiver burden</td>
<td>Statistics from national or local survey data e.g. average number of hours by certain groups</td>
</tr>
<tr>
<td>Volunteering</td>
<td>As above</td>
</tr>
<tr>
<td>Service utilisation, use of resources</td>
<td>Questionnaire has been filled out or data are from NHS or Council performance and monitoring systems</td>
</tr>
<tr>
<td>Unit costs</td>
<td></td>
</tr>
<tr>
<td>Cost of intervention</td>
<td></td>
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</tbody>
</table>
## Studies relevant for decision modelling

<table>
<thead>
<tr>
<th>Topic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probabilities of outcomes</td>
<td></td>
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<tr>
<td>Prevalence of a condition</td>
<td>Survey, cross sectional</td>
</tr>
<tr>
<td>Development of condition over time</td>
<td>Usually longitudinal study design,</td>
</tr>
<tr>
<td>Prognostic or risk factors of condition</td>
<td>Statistical analysis in particular regression to analyse primary or secondary data sets (not always longitudinal)</td>
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