HEALTH ECONOMICS OF TREATING MALNUTRITION: COST EFFECTIVE OR COSTLY?

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Economic considerations
(limited evidence base for nutrition)

• Cost of condition (malnutrition)

• Cost-benefit analysis
  
  All items are in monetary terms
  Inform resource allocation within and between different sectors of the economy

• Cost effectiveness analysis (CEA)
  
  Costs are expressed in relation to an effect e.g. number of infections, or hospital infections or cases of DVT
  Cost per QALY is a special form of CEA – cost-utility analysis
  Usually restricted within a sector e.g. health sector
Republic of Ireland
Expenditure on Health 2008-2013

Budget 2013: Department of Finance

\( e = \text{estimated} \)
Republic of Ireland
Expenditure on Health (% of gross total) 2008-2013

Budget 2013: Department of Finance

e = estimated
IRELAND 2007
Total public expenditure on health & social care
~ €13.7 billion
~ €3,142/capita

Disease related Malnutrition
> €1.4 billion
> 10% of health + social care exp.
> €321/capita

Rice & Normand 2012
Calculating cost of a procedure (nutritional screening)

Unit cost \times \text{No. units} = \text{Total cost}

Cost of screening e.g. 5min nurse time \sim £1.5

\text{No. screened e.g.} \times 10 = £15

Cost in a country for a year

Hospital inpatients = \text{unit cost} \times \text{No screened/year}
Hospital outpatients = \text{unit cost} \times \text{No screened/year}
Nursing homes = \text{unit cost} \times \text{No screened/year}
GP surgeries = \text{unit cost} \times \text{No screened/year}

GRAND TOTAL = \text{Sum of above}
Calculating other costs

- **Nutritional screening**
- **Nutritional assessments***
- **Nutritional interventions****
  (includes net ingredient costs of ONS, ETF, PN)
- **Resource use***
  (includes GP visits, hospital admissions and LOS)

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* Requires information about proportion screened who are malnourished and referred for assessment by a dietitian and its cost

** Requires information about use of ONS, ETF and PN and its cost

*** Requires information about resource use and its cost
Calculating resource impact of intervention

1. Cost of current pathway (as described)

2. Cost of proposed pathway (same methodology) (increased screening, assessment, and intervention and change in resource use* e.g. effect of intervention on hospital LOS)

3. Impact of intervention
   \[ \text{= Costs of proposed pathway - current pathway} \]
## Resource impact per 100,000 people

<table>
<thead>
<tr>
<th>Areas of resource impact</th>
<th>Cost of impact (£1000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in screening – direct costs (5 min nurse)</td>
<td>38.9</td>
</tr>
<tr>
<td>Increase in nutritional assessments (45 min dietitian)</td>
<td>10.8</td>
</tr>
<tr>
<td>Increase in nutritional intervention (ingredient costs etc)</td>
<td>22.0</td>
</tr>
<tr>
<td>Decrease in secondary care activity (mainly hospital stay)</td>
<td>-143.6</td>
</tr>
<tr>
<td>NET cost</td>
<td>-71.8</td>
</tr>
</tbody>
</table>

NICE 2012
## Time taken to screen using ‘MUST’

<table>
<thead>
<tr>
<th></th>
<th>Healthcare worker</th>
<th>Self-screening (OPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some screening tools</td>
<td>10-15</td>
<td>?</td>
</tr>
<tr>
<td>‘MUST’ paper version</td>
<td>≤ 5</td>
<td>5*</td>
</tr>
<tr>
<td>‘MUST’ electronic version</td>
<td>≤ 3</td>
<td>3**</td>
</tr>
<tr>
<td>‘MUST’ wifi electronic system</td>
<td>≤1</td>
<td>1.29***</td>
</tr>
<tr>
<td>‘MUST’ modified wifi electronic system</td>
<td>?≤ 0.5</td>
<td>?0.5</td>
</tr>
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</table>

*Am J Clin Nutr 2012  
** Clin Nutr abstr 2011  
***Nutrition 2013 (in press)
Cost impact per 100,000 population

-150
-100
-50
0
50
100
150
(Costs and cost savings)

Feed cost
Assessment
Screening
Healthcare use
Net effect
Cost saving
NET COST SAVING

NICE 2012
Cost effectiveness plane

New treatment more costly

New treatment less costly

Old treatment dominates

New treatment more costly but more effective

New treatment less costly but less effective

New treatment dominates

New treatment less effective

New treatment more effective

New treatment less costly
Extra cost per QALY gained ('cost per QALY')

- **Unlikely to be approved**
  - £60,000
  - £50,000
  - £40,000
  - £30,000
  - £20,000
  - £10,000

- **Likely to be approved**
  - £45,000

Small N (less confident)

Large N (more confident)
Supplement (milk powder) v dietary advice
malnourished COPD patients in the community

Based on Weekes et al 2009
ONS v simple dietary advice
Randomised trial of malnourished elderly care home residents

ONS
more costly
more effective

QALY gained
Extra cost (£)

£195.82
0.0183 QALY

‘cost/QALY
£10,700

Based on Parsons et al 2009
Cost-effectiveness acceptability curve

- £17,889 (money saved) per QALY gained

Central limit theorem
Bootstrap
Probability of cost-effectiveness
Willingness to pay (x £1000)
Cost-effectiveness acceptability curve

£10,700 per QALY gained

Parsons et al 2012
Cost-effectiveness (‘cost per QALY’) gained by a screening programme (with supplements), by malnutrition risk and baseline mortality (>65y)

<table>
<thead>
<tr>
<th>Mortality (60d)</th>
<th>3%</th>
<th>5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malnutrition</td>
<td>£9,000</td>
<td>£6,000</td>
</tr>
<tr>
<td>(Medium + High risk)</td>
<td>£8,000</td>
<td>£5,700</td>
</tr>
<tr>
<td>4%</td>
<td>£7,200</td>
<td>£5,200</td>
</tr>
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(NICE 2006 report; part of 2-way sensitivity analysis)
Conclusions

• The budget for healthcare has decreased in the Republic of Ireland in recent years. The effect of this on nutritional care is uncertain.

• Economic models of nutritional interventions, by NICE, suggest that improvement in nutritional care results in a cost saving and is cost-effective.

• Economic models of specific conditions also indicate cost-effectiveness of oral nutritional support.

• There is a need for critical systematic reviews on the economics of nutrition interventions and of existing templates for economic modelling.
Who said cost-effectiveness analysis is useful (email circular)?

• There is more money being spent on breast implants and Viagra today than on Alzheimer's research.

• This means that by 2040, there should be a large elderly population with perky boobs and huge erections and absolutely no recollection of what to do with them.