Cost Assessment

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Outline

- Fundamental Concept of Economics
- Cost Assessment
- Time & Discounting
- Cost of Illness
- Example
What counts as an economic evaluation?

<table>
<thead>
<tr>
<th>COSTS (INPUTS) AND CONSEQUENCES (OUTPUTS) EXAMINED?</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPARISON</td>
<td>No</td>
<td>Outcome description</td>
</tr>
<tr>
<td>OF TWO OR MORE ALTERNATIVES?</td>
<td>Yes</td>
<td>Outcome analysis</td>
</tr>
</tbody>
</table>

Source: Drummond et al, 2005
What is health economic evaluation?

Refers to a study that considers both the comparative costs associated with two or more health care interventions, and the comparative clinical effects, measured either in clinical units, health preferences, or monetary benefit.

Source: Drummond et al, 2005
Fundamental Concepts of Economics

- **Scarcity**
  - Resources are insufficient to support all demands

- **Choices**
  - Because of resources scarcity, we need to choose between alternative ways of using them

- **Opportunity cost**
  - By choosing to use available resources in one way, we forgo other opportunities to use these same resources.
Costs

- Input resources utilized by the therapeutic strategy and/or intervention study
  - Accounting cost
  - Economic cost
Accounting cost

- The historical money spends for resources required to produce the intervention.
  - salaries of personnel, rent, office supplies (everything you pay for)
- Acquisition price of product
Economic cost

- **Opportunity cost** of resources used for the intervention
  - Value of the resources if they were used for another productive purpose
  - Includes accounting and “non-accounting” costs
    - volunteer time, donated materials, donated space, etc.
- Economic evaluation studies should use economic costs.
Rules of thumb

- Prices (Charges) > Reimbursements that gov give > Costs
- Reimbursements from large insurers in some countries (e.g., Medicare) may be a reasonable approximation of costs if we don’t have real cost but use the reimbursement list of the health care cost
  - “Monopsony” power allows negotiation of price paid closer to true production cost (i.e., minimum “profit”) only one buyer so more power to negotiate for price
Step To Do Cost Analysis

- Identification (cost of what type??)
- Measurement
- Valuation
Cost Identification
Cost Identification

- Which costs should be considered?
  - What are the type of costs?
  - What is the viewpoint for the analysis? (perspective?)
  - Is the comparison restricted to the two or more programs/interventions immediately under study?
  - Are some costs merely likely to confirm a result that would be obtained by consideration of a narrower range of costs?
  - What is the relative order of magnitude of costs?
What are the type of costs?

- Direct Costs
  - Value of all the goods, services, and other resources that are consumed in the provision of an intervention, side effects, other current and future consequences linked to it.

- Indirect Costs
  - Productivity gains or losses related to illness or death (accounts for Opp cost)

- Intangible costs
  - Monetary value of pain, suffering, distress etc. associated with treatment (measured thru WTP)
Types of direct costs

- **Direct health care costs**
  - Costs of goods and services that are directly provided by the health care system
    - Hospital days, drugs, home nursing

- **Direct non-health care costs**
  - Costs of goods and services used for health care that are not directly provided by the health care system
    - Caregiver time, transportation
Types of indirect costs

- **Indirect health care costs**
  - Costs of health care consumption during year of life gained as a result of a health care intervention
    - Treatment saves a patient from dying from cancer, survivor medical care costs would be the costs of treating the coronary heart disease

- **Indirect non-health care costs/Productivity costs**
  - The value of production loss due to illness or treatment
    - Income lost from sick-leaved
Productivity Costs

- Morbidity costs
  - Costs associated with lost or impaired ability to work or leisure activities due to morbidity

- Mortality costs

- Friction costs
  - Costs associated with the replacement of a worker
Types of cost

- Direct Costs
  - Direct non-health care costs
    - Patient and family out-of-pocket expenses (e.g., transportation, caring)
  - Direct health care costs
    - Fixed Costs
    - Semi-fixed Costs
      - Staff
    - Variable/Material Costs
      - Drugs, blood products, disposable equipment

- Indirect Costs
  - Productivity loss (# days x income/day)

- Intangible Costs
  - Anxiety, pain or suffering

**COST**

**Incurred from:** whether patients are treated or not

**Incurred from:** a patient’s treatment

**For setting up the service**
- e.g. counselling rooms equipment

**For running the services**
- e.g. salary of pharmacists, etc.

**For running the services**
- e.g. lighting, heating, cleaning
<table>
<thead>
<tr>
<th>Type</th>
<th>Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct health care costs</td>
<td>✓</td>
</tr>
<tr>
<td>Direct non-health care costs (transport, caregiver time)</td>
<td>✓</td>
</tr>
<tr>
<td>Indirect health care costs</td>
<td>+/-</td>
</tr>
<tr>
<td>Indirect non-health care costs (productivity etc)</td>
<td>✓</td>
</tr>
<tr>
<td>Intangible costs (cannot monetize suffering)</td>
<td>✗</td>
</tr>
</tbody>
</table>

What is the viewpoint for the analysis?

“How much it cost depends on for whom cost is accounting”

- An item that may be a cost from one point of view may not be in another e.g. patient traveling cost, self-prescription cost

- The perspective must be specified since it determines which costs to consider and whose values to use.
Perspectives can be classified

- Patient
- Provider
- Purchaser or payer
- Employer or other sponsor
- Government
- Societal, more imp for HTA (includes everyone in society)
Societal perspective

• All medical and non-medical costs are relevant - even though the analyst may not be able to measure and value some of them.

• The societal perspective requires valuation of resources using the economic (opportunity) cost approach.
Health insurance (government) perspective

- Certain categories of costs may not be relevant such as patient and care-giver time and travel costs, indirect costs, etc.
  - The health insurance perspective may require valuation of resources using the transaction price (accounting) approach.
<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Patient</th>
<th>Provider</th>
<th>3rd-party payer</th>
<th>Health system</th>
<th>Public/government</th>
<th>Societal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct medical</td>
<td>Treatment/health care: Study setting</td>
<td>charge</td>
<td>cost</td>
<td>Reimburse</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Other health facilities</td>
<td>charge</td>
<td>-</td>
<td>-</td>
<td>charge</td>
<td>charge</td>
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<td>charge</td>
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<td></td>
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<td>-</td>
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<td>-</td>
<td>charge</td>
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<td></td>
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<td>-</td>
<td>-</td>
<td>charge</td>
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<td></td>
<td>House</td>
<td>charge</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>charge</td>
</tr>
<tr>
<td></td>
<td>Time loss</td>
<td>income loss</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Productivity cost</td>
</tr>
<tr>
<td></td>
<td>Informal care</td>
<td>income loss</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Productivity cost</td>
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<tr>
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<td>Personal care</td>
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<td>-</td>
<td>-</td>
<td>charge</td>
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<tr>
<td>Indirect</td>
<td>Morbidity cost</td>
<td>income loss</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>Productivity cost</td>
</tr>
<tr>
<td></td>
<td>Mortality cost</td>
<td>income loss</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Productivity cost</td>
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<td>-</td>
<td>cost</td>
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<td>Education</td>
<td>travel/food/fee/material</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>cost</td>
</tr>
</tbody>
</table>
Cost Identification

- To identify **all** relevant resource items
- Requires knowledge about the resource needed to perform the program

* Tip: expert panel review may be useful for this step

- May reasonable to leave out some resource items from further analysis

“ease of measurement should not be the initial criterion for identification” Gold et al 1996
Cost Measurement
Cost Measurement

- How are values imputed for non-market items? (Eg volunteered time)
- How long should costs be tracked
- When should existing market prices be adjusted?
- How long should costs be tracked?
- Should healthcare costs unrelated to the program or intervention under study be included?
- How should capital outlays (building, land) be handled?
- What is the significance of the average cost-marginal cost distinction?
- How should shared costs be handled?
Costing has two elements

- Measurement of the quantities of resource use \((q)\) eg how many tablets did pt eat

- Assignment of unit costs or prices \((p)\) (of tablet)
How are values imputed for non-market items?

- Non-market items
  - Volunteer time and patient/family leisure time

- Use market wage rates
  - Zero, average earnings, average overtime earnings

- At least be pointed out to decision makers, even if they are not included.
How long should costs be tracked?

- Avoid misleading decision-makers
- Include all related healthcare costs

**Figure 4.1 Choices of the consideration of costs**

Source: Drummond et al 2005
Cost Valuation
Cost valuation

- Gross or top down costing
  - estimate cost for a given volume of patients by dividing the total cost by the volume of service use

E.g. Diagnostic Related Group, daily cost (disease specific per diem) pt with Hypertension
Cost valuation

- Micro or bottom up costing
  - to measure all the resource used by individual patient, then assign the unit cost for each type of resource consumed, and end up with the total summed
  - A lot harder.
Box 4.6: Levels of precision in hospital costing

**Micro-costing**
Each component of resource use (e.g., laboratory tests, days of stay by ward, drugs) is estimated and a unit cost derived for each.

**Case-mix group**
Gives the cost for each category of case or hospital patient. Takes account of length of stay. Precision depends on the level of detail in specifying the types of cases.

**Disease-specific per diem (or daily cost)**
Gives the average daily cost for treatments in each disease category. These may still be quite broad (e.g., orthopaedic surgery).

**Average cost per diem (or daily cost)**
Averages the per diem overall categories of patient. Available in most health care systems.

Source: O’Brien 2004
Cost valuation

- Methods used to approximate costs did not affect the main results of the economic comparisons for any of the trials.

- Conversion of charges to costs by cost-to-charge ratios appears to represent a reasonable compromise between accuracy and ease of implementation. Charge/cost = price to charge ratio

- Human capital approach is most frequently applied to estimate lost earnings or output due to morbidity or premature mortality.
Valuing Non-market Labor: Two Methods

1 Human Capital Approach
   • Wages of persons who would replace the worker (upper bound)
     ▪ Example: value of time of an individual caring for a sick relative would be based on the wages of a care assistant
   • Market wage rate (per hour) for the volunteering individual
     ▪ the labor opportunity cost for the individual
     ▪ or from those with similar characteristics
Valuing Non-market Labor: Two Methods

2 Friction cost method

- Unemployment rate
- Mortality case
  - productivity loss only during that ‘Friction period’ (recruiting and training of replaced worker)
- Morbidity case
  - compensatory mechanisms
  - Short term vs. long term

Further reading: Koopmanschap 1992; 1993; 1995 etc.
Valuing Non-market Labor: Tips

- Be aware of double counting in cost-utility analysis (mortality and morbidity has been already been taken to account when we measure the quality of life score)

- Since productivity lost and QALY are valuing the same effect—the loss in healthy time

- Also, the value attached to leisure time can reasonably be expected to be included within the QALY
Time & Discounting
Differential Timing in Health Care

- Costs and consequences for health care interventions often occur at different times
  - Ex: smoking cessation, chemotherapy

- Individuals prefer money today to money in the future OR would prefer to postpone costs into the future

- The risk-free “interest” rate associated with this notion is called the time preference rate
  - separate from inflation rate and risk rate
Allowance for Differential Timing

- Time Preference:
  - If competing programs have different cost streams into the future, a method must be used to adjust these cost data to allow for comparison

- To account for time preference, one must discount future costs and benefits to a present value
Discounting (Future to Present)

Present Value = \( \Sigma \frac{\text{Cost}_n}{(1+r)^n} \)

- \( \Sigma \): sum across all \( n \) relevant years
- \( r \): time preference rate (discount rate)
- \( n \): year from start of program
## Discount rate example

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost Program A</th>
<th>Cost Program B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>SUM</td>
<td>30</td>
<td>29</td>
</tr>
</tbody>
</table>
Discount Rate Example

- If the discount rate is 5%
- If all costs accrue at the start of each year
- How to calculate the net present value of each program?
- What is the discounted cost?

• A = 28.13
• B = 28.15
Discounting Costs and Benefits

- What happens if we discount costs but do not discount benefits?
  - We get odd conclusions!
  - It is always better (more cost effective) to delay the start of a program
The Keeler-Cretin Paradox

Discounting costs but not benefits can lead to some very odd results.

Consider a treatment programme, relative to some alternative which generates life-years and costs at some point in the future. Suppose we discount costs at 5% but do not discount benefits. What happens to the ratio of costs to effects?

<table>
<thead>
<tr>
<th></th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs ($)</td>
<td>100</td>
<td>100/1.05=95.2</td>
<td>100/1.1-90.7</td>
</tr>
<tr>
<td>Effects (LYs)</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>C/E</td>
<td>10</td>
<td>9.52</td>
<td>9.07</td>
</tr>
</tbody>
</table>

Due to discounting of costs only it appears more attractive to delay the programme indefinitely (C/E is decreasing over time)

Source: O’Brien 2004
What are accepted discount rates for cost effectiveness analysis?

- **US Panel on Cost Effectiveness in Medicine**
  - 3% base costs and benefits
  - 5% and 0% in sensitivity analyses

- **United Kingdom**
  - NICE guidance (2004) -- 3.5% for costs, 3.5% for benefits
Discounting (Past to Present)
<table>
<thead>
<tr>
<th>Year</th>
<th>ปี</th>
<th>CPI (Consumer price index of Thailand, all items)</th>
<th>Medical and personal care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>2535</td>
<td>72.1</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>2536</td>
<td>74.5</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>2537</td>
<td>78.2</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>2538</td>
<td>82.8</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>2539</td>
<td>87.6</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>2540</td>
<td>92.5</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>2541</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>2542</td>
<td>100.3</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>2543</td>
<td>101.9</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>2544</td>
<td>103.5</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>2545</td>
<td>104.2</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>2546</td>
<td>105.2</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>2547</td>
<td>106.1</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>2548</td>
<td>116.1</td>
<td></td>
</tr>
<tr>
<td>2006*</td>
<td>2549</td>
<td>120.4</td>
<td></td>
</tr>
</tbody>
</table>

2001 CPI = 107.9
2001 Cost/ person-year = 6,331 baht

2004 CPI = 111.7
2004 Cost/ person-year = \((111.7/107.9) \times 6,331\) = 6,554 baht
Practical tips for costing

1. Decide on the **perspective** as it determines the components of the numerator

2. Costing is time consuming, thus carefully consider those costs that may be **important** to the study and spend the time collecting these data accurately

3. Be aware of **double counting**, especially in cost-utility analysis

4. Be adjusted for differential timing (**discounting**)
Types of Cost Studies

- **Retrospective** - to predict the cost impact of interventions after implementation

- **Models** - are designed to predict the cost impact of interventions before (or after) implementation

- **Prospective study** - Consistent and reliable cost estimates may be obtained since actual cost data can be collected during the intervention
Cost of Illness (COI)
Why Cost of Illness?

- The rapid growth of healthcare expenditures
- Limited resource
- This forces society to decide which services and products is the most suitable for patient care
What is Cost of Illness?

- The total costs incurred by a society due to a specific disease.
Measurement of Direct Costs

• Direct health care costs
  ▪ Expenditures for medical care and the treatment of the illness
    • hospital care
    • physician services
    • nursing home care
    • drugs
    • other medical needs

• Direct non-health care costs
  ▪ Transportation costs of patients
  ▪ Costs of care-giving by family members
Measurement of Indirect Costs

- Productivity losses caused by the problem or disease, borne by the individual, family, society, or by the employer
- Loss in earning
Health Care Costs of Various Disorders

The chart shows the health care costs of various disorders in billions of dollars, distinguishing between direct and indirect costs.

- Diabetes
- Cerebrovascular Disease
- Mental Disease
- Digestive Disease
- Heart Disease
- Kidney/Urologic Disease
- Alcoholism
- Arthritis
- Alzheimer's/Dementia
- Drug Abuse
- Cancer
- Multiple Sclerosis
- HIV/AIDS

The costs range from a few billions up to 160 billions of dollars.
<table>
<thead>
<tr>
<th>Uncured Disease</th>
<th>Approximate Annual Prevalence</th>
<th>Approximate Economic Cost ($billions)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Diseases</td>
<td>56,000,000</td>
<td>$128</td>
<td>American Heart Association</td>
</tr>
<tr>
<td>Cancer</td>
<td>10,000,000</td>
<td>$104</td>
<td>American Cancer Society</td>
</tr>
<tr>
<td>Alzheimer’s Disease</td>
<td>4,000,000</td>
<td>$100</td>
<td>Alzheimer’s Association</td>
</tr>
<tr>
<td>Diabetes</td>
<td>16,000,000</td>
<td>$ 92</td>
<td>American Diabetes Association</td>
</tr>
<tr>
<td>Arthritis</td>
<td>40,000,000</td>
<td>$ 65</td>
<td>Arthritis Foundation; Alliance for Aging Research</td>
</tr>
<tr>
<td>Depression</td>
<td>17,400,000</td>
<td>$ 44</td>
<td>National Depressive and Manic Depressive Association</td>
</tr>
<tr>
<td>Stroke</td>
<td>3,000,000</td>
<td>$ 30</td>
<td>National Stroke Association</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>28,000,000</td>
<td>$ 10</td>
<td>Alliance for Aging Research</td>
</tr>
</tbody>
</table>
Advantages of Cost of Illness

- Portray the impact that society faces from a disease

- For the government
  - budgetary allocations
  - prioritizes research funding
  - justifies funding for existing and new disease programs

- Focus society’s attention on health and assist the decision making process
Example of the social cost of substance abuse in Switzerland

• Vitale et al. (1998) The social cost of tobacco consumption in Switzerland, University of Neuchâtel.

• Jeanrenaud et al. (2003) The social cost of alcohol abuse in Switzerland, University of Neuchâtel.

• Jeanrenaud et al. (2005) The social cost of illicit drug use in Switzerland, University of Neuchâtel.
Cost assessment method

- Two broad categories of method: preference-based (or willingness-to-pay) vs. non preference-based (or production based-method).

- **Direct cost**: treatment cost method, replacement cost method.

- **Indirect cost**: human capital (discounted value of actual and future forgone production).

- **Intangible cost**: willingness-to-pay method based on a hypothetical market.
## Epidemiological data

<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence*</td>
<td>1 950 000</td>
<td>357 000</td>
<td>30 000</td>
</tr>
<tr>
<td>Premature death</td>
<td>8 300</td>
<td>2 137</td>
<td>322</td>
</tr>
<tr>
<td>Loss of productive life years**</td>
<td>49 700</td>
<td>28 500</td>
<td>11 300</td>
</tr>
<tr>
<td>Average loss of life year</td>
<td>6.0</td>
<td>13.3</td>
<td>35.1</td>
</tr>
</tbody>
</table>

* Tobacco: use; Alcohol: harmful use and dependency; illicit drugs: dependency to heroin and cocaine.
** Up to 74

## Direct cost

<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical cost</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HIV/AIDS treatment</td>
<td>-</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Dependency treatment</td>
<td>no</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Harm reduction</td>
<td>-</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Property damage</td>
<td>no</td>
<td>✓</td>
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<tr>
<td>Law enforcement cost</td>
<td>no</td>
<td>no</td>
<td>✓</td>
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<tr>
<td>Other public policy cost*</td>
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<td>✓</td>
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<tr>
<td>Product turnover</td>
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* Prevention and research
## Direct cost

### Direct cost

<table>
<thead>
<tr>
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<th>Alcohol</th>
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<tbody>
<tr>
<td>Medical cost</td>
<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>HIV/AIDS treatment</td>
<td>-</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Dependency treatment</td>
<td>no</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Harm reduction</td>
<td>-</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td>Property damage</td>
<td>no</td>
<td>✓</td>
<td>no</td>
</tr>
<tr>
<td>Law enforcement cost</td>
<td>no</td>
<td>no</td>
<td>✓</td>
</tr>
<tr>
<td>Other public policy cost*</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Product turnover</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

* Prevention and research

### Direct costs, CHF million

<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment*</td>
<td>1 211.8</td>
<td>594.8</td>
<td>560.8</td>
</tr>
<tr>
<td>Material damages</td>
<td></td>
<td>111.9</td>
<td></td>
</tr>
<tr>
<td>Public policy cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Prevention</td>
<td>9.0</td>
<td>20.0</td>
<td>14.6</td>
</tr>
<tr>
<td>*Law enforcement</td>
<td>19.7</td>
<td>798.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1 220.8</td>
<td>746.4</td>
<td>1 373.8</td>
</tr>
</tbody>
</table>

*Medical treatment and dependency therapy
### Indirect cost

#### Indirect (production loss)

<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect mortality cost</td>
<td>1 829.0</td>
<td>1 261.6</td>
<td>637.6</td>
</tr>
<tr>
<td>Indirect morbidity cost</td>
<td>2 587.0</td>
<td>430.0</td>
<td>1 781.8</td>
</tr>
<tr>
<td>Indirect cost total</td>
<td>4 416.0</td>
<td>1 691.6</td>
<td>2 419.4</td>
</tr>
</tbody>
</table>

- Mortality cost is the present value of lost earnings (or production) due to premature death.
- Morbidity cost is the production lost through work impairment, reduced efficiency at work or a higher risk of being unemployed.
### Intangible cost: Loss in QoL

**Human cost: loss in quality of life**

<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drugs*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiopathological effects</td>
<td>4,961.0</td>
<td>2,539.1</td>
<td>391.3</td>
</tr>
<tr>
<td>Psychosocial and behavioural effects</td>
<td>-</td>
<td>1,749.6</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,961.0</td>
<td>4,288.7</td>
<td>391.3</td>
</tr>
</tbody>
</table>

* Dependency to heroïne and cocaïne

** Psychosocial and behavioural effects: alcohol dependant person only
# Social burden of tobacco, alcohol and illicit drugs

## Social cost of substance abuse in CHF million

<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct cost</td>
<td>1 220</td>
<td>726</td>
<td>1 374</td>
</tr>
<tr>
<td>Indirect cost</td>
<td>3 809</td>
<td>1 465</td>
<td>2 314</td>
</tr>
<tr>
<td>Human cost</td>
<td>4 961</td>
<td>4 288</td>
<td>391</td>
</tr>
<tr>
<td>Social cost</td>
<td>9 990</td>
<td>6 480</td>
<td>4 079</td>
</tr>
</tbody>
</table>

## Cost per case

<table>
<thead>
<tr>
<th></th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence*</td>
<td>1 950 000</td>
<td>357 000</td>
<td>30 000</td>
</tr>
<tr>
<td>Attributable cost, CHF million per year</td>
<td>9 982</td>
<td>4 900</td>
<td>3 510</td>
</tr>
<tr>
<td>Cost per case, CHF 1000 per year**</td>
<td>5.1</td>
<td>13.7</td>
<td>117.0</td>
</tr>
</tbody>
</table>

* Tobacco: use; Alcohol: harmful use and dependency; Illicit drug: dependency on heroin and cocaine

** Cost per case for illicit drug without law enforcement: CHF 103.7 thousands
## Cross country comparison: cost of substance abuse as a % of GDP

<table>
<thead>
<tr>
<th>Country</th>
<th>Tobacco</th>
<th>Alcohol</th>
<th>Illicit drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco costs</td>
<td>1.4</td>
<td>0.6</td>
<td>0.9</td>
</tr>
<tr>
<td>All costs</td>
<td>2.7</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>United States</td>
<td>-</td>
<td>2.4</td>
<td>1.6</td>
</tr>
<tr>
<td>(Harwood et al. 1998)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco costs</td>
<td>1.3</td>
<td>1.0</td>
<td>0.9</td>
</tr>
<tr>
<td>All costs</td>
<td>3.7</td>
<td>1.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Single et al. 1998)</td>
<td>1.4</td>
<td>1.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Scotland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Varney and Guest 2002)</td>
<td>-</td>
<td>-</td>
<td>1.5</td>
</tr>
<tr>
<td>France</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Kopp et al. 2002)</td>
<td>1.1</td>
<td>1.2</td>
<td>0.2</td>
</tr>
</tbody>
</table>
Thank you, Any question?

usa.c@hitap.net