THE IMPORTANCE OF THE TIME FACTOR IN FIRE AND RESCUE SERVICE OPERATIONS IN SWEDEN

– AN UPDATE OF A SOCIO-ECONOMIC STUDY
(published 2004)

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Purpose of the study

– Find the *effect of the time* factor for a faster turn-out for fire and rescue services in Sweden.
– Value this time factor in *monetary values*
– Present results that are possible to use in an economic *cost-benefit analysis*.

Questions that can be answered:

• A new fire and rescue services station is to be built. Where is the best place to allocate it?

• A new alarm system is being installed which reduces turn-out time by one minute. Can we put a value of the time saved?
Decision rule cost-benefit analysis

- Benefits are compared to costs
- Both benefits and costs are valued in monetary units
- If benefits > costs then the project should be implemented
Analysis of finding monetary value of response time

1. Find the statistical correlation between response time and damage (lives lost, injuries, property damage)

2. Value the statistical correlation in monetary terms.
Example drowning accidents, statistical correlation
Monetary values used (2003)

Personal injuries:
- Value of statistical life: 15.4 million SEK
- Value of serious injury: 2.8 million SEK
- Value of mild injury: 0.016 million SEK

(1 SEK=0.12USD=0.11EUR; average currency rates in 2003)

Property damage:
- Buildings: transferred from Norwegian data
- Forests: Swedish market data
### SUMMARY OF RESULTS

<table>
<thead>
<tr>
<th>Category</th>
<th>SEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire in building</td>
<td>137800</td>
</tr>
<tr>
<td>Traffic accident</td>
<td>86200</td>
</tr>
<tr>
<td>Drowning</td>
<td>267900</td>
</tr>
<tr>
<td>Fire not in building</td>
<td>5000</td>
</tr>
<tr>
<td>Discharge of hazardous substance</td>
<td>3900</td>
</tr>
<tr>
<td>Water damage</td>
<td>1100</td>
</tr>
<tr>
<td>Landslide/Avalanche</td>
<td>14200</td>
</tr>
<tr>
<td>Animal rescue</td>
<td>800</td>
</tr>
<tr>
<td>Storm damage</td>
<td>250</td>
</tr>
<tr>
<td>Other municipal rescue services</td>
<td>26300</td>
</tr>
<tr>
<td>False alarm/supposed fire/rescue</td>
<td>0</td>
</tr>
<tr>
<td>Automatic alarm (not fire)</td>
<td>0</td>
</tr>
</tbody>
</table>
| **TOTAL**                               | **32100** | **100%**

1 SEK=0.12 USD=0.11 EUR; average currency rates 2003.
Can the same analysis be done for ambulance services?

YES!
Ambulance study: Thailand

• Joint project:
  – Emergency Medical Institute Thailand, EMIT
  – Ministry for Foreign Affairs, Sweden
  – Karlstad University, Sweden.

• How much value is saved by decreasing response time with 1 minute?
  – Ambulance services.
  – Data on response time and deaths/injuries/illnesses in Thailand.
  – Thai monetary values on deaths and injuries.

• Results of the study:
  1-2 billion Thai Bath can be saved per minute and year
  (=30-60 million USD= 25-50 million EUR)
Requirements for an analysis

Data requirements

– Response time must be available
– Outcome must be measurable in some sort of scale that later can be valued in monetary units
  • Deaths, injuries, property values
– Other factors should be possible to control for (weather, quality and number of personnel, operations done, protection devices etc)
– Data on many years – since a lot of factors, other than time, affects the outcome

Value requirements

– Monetary value of statistical lives and injuries must be available
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