A web tool to support the user need elicitation for the Health Technology Assessment (HTA) in emerging countries

L. Pecchia\textsuperscript{1}, S. Mullally\textsuperscript{2}, F. Crispino\textsuperscript{3}, S. Morgna\textsuperscript{4}

\textsuperscript{1} University of Warwick, The United Kingdom
\textsuperscript{2} Biomedical engineering consultant, Canada
\textsuperscript{3} Business Engineering, Avellino, Italy
\textsuperscript{4} University of Nottingham, The United Kingdom

l.pecchia@warwick.ac.uk
AHP for HTA & User Need Elic.

**NEED ANALYSIS**
- Individuation
- Classification
- Prioritization

**IDENTIFY EXISTING TECHNOLOGIES**

**MULTIDIMENSIONAL EVALUATION**
- Economical
- Ethic/Social
- Clinical Epidemiological

**DATA ANALYSIS**

**RELATIVE ASSESSMENT**
- Efficacy
- Efficiency
- Performance

**DISSEMINATION OF INFORMATION**

**MONITORING**

**INTRODUCTION**

**METHOD**

**RESULTS**

- How to prioritize the needs?
- How to measure the MD performance in non-clinical domains?
- How to measure the fitting between MD performance and needs?
Prioritizing health technologies for a clinical problem (i.e. congestive heart failure)

**Technological domain**
- (services/spare parts/Human F)
  - [Medical Eng.]

**Clinical domain**
- (effectiveness/utility)
  - [clinicians/cardiologists/ger.]

**Economical domain**
- (costs)
  - [Hosp. Managers]

How important is each need for the assessment?  
[needs prioritization]

How each alternative satisfy each factor?  
[MD performance]

How each alternative fit with the goal?  
[MD/Goal fitting]
### AHP method

**Pairwise comparisons Process**

#### Numerical values

- Much more: (5)
- More important: (3)
- Equally important: (1)
- Less important: (1/3)
- Much less important: (1/5)

---

According to your experience, how important is each need on the left compared with each one on the right?

<table>
<thead>
<tr>
<th>Need 1 (↓ mortality)</th>
<th>is:</th>
<th>much more</th>
<th>more</th>
<th>equally</th>
<th>less</th>
<th>much less</th>
<th>important hen</th>
<th>Need 2 (↓ Pz. worsening)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need 2 (↓ Pz. worsening)</td>
<td>is:</td>
<td>much more</td>
<td>more</td>
<td>equally</td>
<td>less</td>
<td>much less</td>
<td>important hen</td>
<td>Need 3 (↑ QALY)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need 3 (↑ QALY)</td>
<td>is:</td>
<td>much more</td>
<td>more</td>
<td>equally</td>
<td>less</td>
<td>much less</td>
<td>important hen</td>
<td>Need 1 (↓ mortality)</td>
</tr>
</tbody>
</table>

```plaintext
N1 ≫ N3
N1 > N3
N1 < N3
```

---

Corresponding author: Leandro Pecchia, l.pecchia@warwick.ac.uk
AHP method
Analytic needs prioritization

Developing (or selecting) the health technology for a clinical problem (i.e. congestive heart failure)

Technological domain
(services/spare parts/ Human F)
[Medical Eng.]

Clinical domain
(effectiveness/utility)
[clinicians cardiologists/ger.]

Economical domain
(costs)
[Hosp. Managers]

-- Cat 1
\[SCW_1 \]

-- Cat 2
\[SCW_2 \]

-- Cat 3
\[SCW_3 \]

usability
education
service
↓ worsening
↓ mortality
↑ qaly
Initial cost
ReadmissionC.

\[GW_1 = GW \]
\[GW_2 \]
\[GW_3 \]
\[GW_4 \]
\[GW_5 \]
\[GW_6 \]
\[GW_7 \]
\[GW_8 \]

\[Cat = 1 \]
\[SC \]
\[Cat = 1 \]
\[CW \]
\[Cat = 1 \]
\[SCW \]
AHP for HTA

**INTRODUCTION**

**METHOD**

**RESULTS**

- **ALTERNATIVE 1**
  - DMP
  - Global importance
  - usability
  - education
  - service
  - ↓ worsening

- **ALTERNATIVE 2**
  - Telemedicine

- **ALTERNATIVE 3**
  - Active Implantable D.

**SUMMARY**

- $\sum_{i=1}^{8} A_i = 30$

---

**BMC Medical Informatics & Decision Making**

**Research article**

User needs elicitation via analytic hierarchy process (AHP). A case study on a Computed Tomography (CT) scanner

Leandro Pecchia, Jennifer L Martin, Angela Ragozzino, Carmela Vanzanella, Arturo Scognamiglio, Luciano Mirarchi and Stephen P Morgan

**Corresponding author:** Leandro Pecchia, l.pecchia@warwick.ac.uk
The system
a web tool with App
Two possible scenarios:

- **S1: Local**
  - elicitior, domain experts and the final responders in the same place
  - Using the APP to speed-up the process and find consensus

- **S2: Remote**
  - elicitior, domain experts and the final responders NOT in the same place,
  - Using the APP and the portal to cooperate to the study via the web.

Functionalities:

- **Create the Hierarchy**: problem definition/hierarchy draft
- **Download an existing hierarchy**: to be used as starting model
- **(only S2) Invite domain experts**: study piloting
- **(only S2) Amend the hierarchy**
- **(only S2) Invite responders**
- **(only S2) Participate to the study**
- **Analyse and Pool results**
- **Generate a report**
- **Publish**: upload on the portal hierarchy | results | reports | papers
A web tool to support the user need elicitation for the Health Technology Assessment (HTA) in emerging countries

L. Pecchia\textsuperscript{1}, S. Mullally\textsuperscript{2}, F. Crispino\textsuperscript{3}, S. Morgna\textsuperscript{4}

\textsuperscript{1} University of Warwick, The United Kingdom  
\textsuperscript{2} Biomedical engineering consultant, Canada  
\textsuperscript{3} Business Engineering, Avellino, Italy  
\textsuperscript{4} University of Nottingham, The United Kingdom

l.pecchia@warwick.ac.uk