ECHO –
European Collaboration for Healthcare Optimization
An international project on healthcare performance

Enrique Bernal-Delgado on behalf of the ECHO consortium
Hysterectomy in benign conditions

<table>
<thead>
<tr>
<th></th>
<th>ENG</th>
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</thead>
<tbody>
<tr>
<td>Std Rate/10,000</td>
<td>15.58</td>
<td>17.84</td>
<td>14.12</td>
<td>11.05</td>
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<tr>
<td>EQ&lt;sub&gt;5-95&lt;/sub&gt;</td>
<td>1.88</td>
<td>1.84</td>
<td>2.29</td>
<td>2.34</td>
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<td>0.10</td>
<td>0.18</td>
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</table>
Challenges in international comparison

• Adapting the rationale to contextual elements
  – Supply in non-existing or strongly intervened markets
  – Preference-sensitive in a context of limited choice
  – Maps boundaries do not necessarily mean the same

• Methods
  – Apples and Pears → the need of a common language
  – Variation also depends on the basal rates
  – Size is so different in Europe –
    • Geographic representation have to be changed
    • Some additional statistics are required.

• Explaining variations: the need of profiling institutions
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Rate vs CSV
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- Explaining variations: the need of profiling institutions
A heterogeneous reality (lowest level areas)

<table>
<thead>
<tr>
<th>Inhabitants</th>
<th>Denmark</th>
<th>England</th>
<th>Portugal</th>
<th>Spain</th>
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<td>%</td>
<td>n</td>
<td>%</td>
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<tr>
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<td>95</td>
<td>29.14</td>
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<td>104</td>
<td>31.90</td>
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<td>2.04</td>
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<tr>
<td>&lt; 499,999</td>
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<td>0</td>
<td>5</td>
<td>1.53</td>
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<td>1.53</td>
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<tr>
<td>&gt; 1,000,000</td>
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<td>1</td>
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<tr>
<td>total</td>
<td>99</td>
<td>100</td>
<td>326</td>
<td>100</td>
</tr>
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• Explaining variations: the need of profiling institutions
Former 99 units

New 28 areas
Challenges in international comparison

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- Explaining variations: the need of profiling institutions
Proper statistics in measuring systematic variation

Coefficient of Variation vs. EB statistic

Empirical Bayes vs. Coefficient of Variation
England: knee replacement and prostatectomy

- knee replacement: 20.6, 10.5, 5.01, 9.3
- prostatectomy: 16.3, 12.2, 4.5, 9.9
Estimating SUR: adding spatial correlation
SUR vs BYM –areas98

SFV: 0.55
Challenges in international comparison

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- Explaining variations: the need of profiling institutions
Institutional features in service provision

Country differences in CSV – weighted by average rate
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<td>Std Rate/10,000</td>
<td>21.45</td>
<td>7.92</td>
<td>22.17</td>
<td>12.05</td>
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<tr>
<td>EQ&lt;sub&gt;5-95&lt;/sub&gt;</td>
<td>3.12</td>
<td>18.81</td>
<td>3.57</td>
<td>22.52</td>
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<tr>
<td>SCV</td>
<td>0.61</td>
<td>0.89</td>
<td>0.60</td>
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C-section low risk deliveries 2009 (women 15-55 yo)
### Radical mastectomy in breast cancer 2009

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<td><strong>Std Rate/10,000</strong></td>
<td>88.08</td>
<td>13.25</td>
<td>28.99</td>
<td>12.66</td>
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<tr>
<td><strong>EQ&lt;sub&gt;5-95&lt;/sub&gt;</strong></td>
<td>4.29</td>
<td>1.63</td>
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C-section LR over time

- **ENGLAND Standard Rate (SR)**
- **ENGLAND SCV**

- **PORTUGAL Standard Rate (SR)**
- **PORTUGAL SCV**

- **SLOVENIA Standard Rate (SR)**
- **SLOVENIA SCV**

- **SPAIN Standard Rate (SR)**
- **SPAIN SCV**
The concept

- ECHO has set about the task of bringing together patient-level data from Austria, Denmark, England, Portugal, Slovenia and Spain, making them comparable.

- ECHO is expanding the usual approach in healthcare performance international comparison, by adding the variation framework.

- **Performance dimensions:** utilization, equitable access to effective care, quality, and efficiency, in terms of opportunity costs, and provider-level efficiency.

- Healthcare areas or hospital providers will be flagged as good- or poor performers – **not a diagnostic tool but a screening tool**
1. **Effective care** (hip fracture, colectomy in colorectal cancer, breast surgery in breast cancer, etc)

2. **Uncertain benefit/harm balance in “non-average” patients** (CABG, knee replacement, etc.)

3. **Doubtful/ lower value care and opportunity costs** (tonsillectomy, spinal fusion, prostatectomy, etc.)

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**Hospital-perspective**

1. **In-hospital case fatality rates for a condition** (admissions with principal diagnosis of acute myocardial infarction, ischemic stroke);

2. **In-hospital case fatality rates after a procedure** (in hospital mortality after CABG, PCI, non-ruptured abdominal aortic aneurysm, hip replacement)

3. **Patient safety event rates** (Trauma after vaginal delivery with and without instrumentation, Catheter-related infection, Pulmonary Thromboembolism or Deep venous thrombosis, Postoperative sepsis)
Some messages from ECHO ... ... with potential impact in policy making

Utilization of effective procedures
Equity
Value - quality
Value - efficiency
Utilization of effective procedures

• At population level, the burden of ischemic disease does barely explain variation in revascularization;

• Might be a symptom of under or overuse
PCI, CABG and burden of ischemic disease

Population rates of procedures

PCI

CABG

Burden of ischemic disease

Burden of ischemic disease
Flagging areas beyond the expected PCI
Equity

• *Revascularization is performed differently across income quintiles, not always coherent with need.*

• *Differences beyond need might represent inequities in access.*
Quality

Case-fatality rates vary dramatically across high-volume hospitals, irrespective of the differences in patient case-mix.

Hospital flagged as poor (or good) performers are likely to behave consistently overtime.
CABG fatality rates in high volume hospitals
Efficiency (value)

Variation in low-value procedures is huge, within and across countries.

Areas with high number of low-value procedures are facing high opportunity costs.
C-section in low-risk deliveries

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Efficiency (value)

Hospitals are getting different outcomes regardless patients’ differences. On the other hand, hospitals are managing differently those resources devoted to treat similar patients.

Hospital with poor outcomes and higher use of resources are likely providing lower-value care.
SHORTER LOS

LESS MORTALITY

(-) High resource use
(-) Bad health outcome

(+ ) Low resource use
(-) Bad health outcome

(+ ) Low resource use
(+ ) Good health outcome

(+ ) Good health outcome

Resource use

Benchmark

Health outcome

Benchmark
DENMARK

Calculated for female patient, aged 18-55, no comorbidities

rho=-0.17 [CI: -0.27; -0.08]
AMI - risk-adjusted

Calculated for female patient, aged 18-55, no comorbidities
SPAIN

Predicted LoS survived vs Pr(Survival)

- England
- Portugal
- Slovenia
- Denmark
- Spain

rho = -0.17 [CI: -0.27; -0.08]

Calculated for female patient, aged 18-55, no comorbidities
PORTUGAL

AMI - risk-adjusted

Calculated for female patient, aged 18-55, no comorbidities

rho=-0.17 [CI: -0.27; -0.08]
ENGLAND

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