Outline

• Overview of the project
• Preliminary results
  – Descriptive
  – Analytical
• Next steps
PROJECT OVERVIEW
Project objectives

- A: undertake a descriptive analysis of CVD and diabetes indicators and identify potential reasons for cross-country differences and trends
- B: Analyse health system performance in relation to CVD and diabetes outcomes
- C: Explain variation in health system performance
A: Descriptive analysis

• Use relevant CVD and diabetes indicators incorporating lifestyles, utilisation, quality and outcomes

• To identify potential reasons for cross-country variation and changes over time, use:
  – existing peer-reviewed and grey literature to comment on trends
  – Results of questionnaires

• Describe organisational aspects of CVD/diabetes care
How do countries vary in their ability convert health inputs to outcomes?

Use of multi-level modelling
- Country-specific time-trends
- Country-specific fixed-effects

Series of models:
- Dependent variables
- Independent variables

Which countries have performed better/worse than OECD average?
C: Explaining variation in health system performance

- What characteristics and policy settings help explain potential health system variation?
  1. Extension of multilevel model
  2. Panel data techniques
  3. Heart failure sub-project (with European Society of Cardiology)

- Characteristics and policy settings derived from HSC survey and our own survey:
  - CVD and diabetes specific
  - Broader indicators that may affect CVD and diabetes
# Project time frame and expert inputs

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeframe</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1\textsuperscript{st} CVD/diabetes survey design/distribution</td>
<td>Jan 2013</td>
<td>✓</td>
</tr>
<tr>
<td>Return 1\textsuperscript{st} questionnaire</td>
<td>May 2013</td>
<td>✓</td>
</tr>
<tr>
<td>Design and test 2\textsuperscript{nd} CVD/diabetes survey</td>
<td>May-Jun 2013</td>
<td>✓</td>
</tr>
<tr>
<td>2\textsuperscript{nd} CVD/Diabetes survey in the field</td>
<td>Jun to Sep 2013</td>
<td>✓ (extended)</td>
</tr>
<tr>
<td>Draft report (A)</td>
<td>End 2013</td>
<td>extended to Q1 2014</td>
</tr>
<tr>
<td>Finalise analysis (B and C)</td>
<td>Jan-Apr 2014</td>
<td></td>
</tr>
<tr>
<td>Draft report (A,B,C)</td>
<td>Nov-May 2014</td>
<td></td>
</tr>
<tr>
<td>Final report (A,B,C)</td>
<td>End 2014</td>
<td></td>
</tr>
</tbody>
</table>
PROGRESS REPORT
A: CVD mortality compared

Mortality from circulatory diseases
Mortality from all other causes

Age-standardised rates per 100 000 population
A: Percentage fall in CVD mortality 1985-2011
A: Mortality and premature mortality

![Graph showing mortality rate and potential years of life lost per 100,000 population for different countries.](image-url)
A: Univariate relationships example: diabetes admissions and AMI case-fatality
A: Univariate relationships example: diabetes prevalence and pharmaceutical consumption
A. Further descriptive analysis:

- **Descriptive data:**
  - Main health outcomes trends - by major CVD category, gender, age
  - Pharmaceutical consumption
  - Continue examining of univariate relationships between:
    - Mortality, PYLL, case-fatality, ESRF
    - Utilisation, risk factors, quality indicators
Basic model:

\[ y_{it} = \beta_{0i} + \beta_{1i} I_{it} + \alpha_p x_{pit} + e_{it} \]  \hspace{1cm} (1)

- \( y \) is outcome of interest in country \( i \) at time \( t \).
- \( \beta_0 \) and \( \beta_1 \) are the intercept and slope coefficients that vary by country.
- \( I \) is the explanatory variable of interest.
- \( \alpha \) refers to fixed slope coefficients for \( p \) control variables \( x \).
- \( e \) is the residual error term.
B: variables

Series of models:
- Dependent variables:
  - Mortality rate by major CVD groups
  - Potential Life-Years Lost (PLYL) by major CVD groups.
  - CVD case-fatality rates (AMI, hemorrhagic stroke, ischemic stroke)
  - Diabetes admissions and complications (dialysis, transplants, lower extremity amputations)

- Independent variables:
  - Physical inputs (e.g. number of doctors)
  - Financial inputs by health sector

- Control variables (income, public coverage, lifestyle, time)
### B. Preliminary results (model 8: AMI case-fatality)

| AMI case-fatality (ln)                        | Coef.  | Std. Err. | P>|z|  |
|-----------------------------------------------|--------|-----------|------|
| Hospital expenditure (ln)                     | -0.265 | 0.151     | 0.079|
| % public funding                              | -0.094 | 0.277     | 0.733|
| Mean income (ln)                              | 0.039  | 0.122     | 0.746|
| % smoke                                       | 0.010  | 0.006     | 0.118|
| Alcohol (annual l. per cap)                   | -0.010 | 0.012     | 0.412|
| Year                                          | -0.054 | 0.006     | 0.000|
| Constant                                      | 112.672| 11.458    | 0.000|

Likelihood ratio test to determine whether random slope model is justified:
LR chi2(2) = 26.93 (Prob > chi2 = 0.0000)
### B. Preliminary results (model 8)

<table>
<thead>
<tr>
<th>Random-effects Parameters</th>
<th>Estimate</th>
<th>Std. Err.</th>
</tr>
</thead>
<tbody>
<tr>
<td>country_id: Unstructured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>var(hospital expenditure)</td>
<td>0.284</td>
<td>0.151</td>
</tr>
<tr>
<td>var(Constant)</td>
<td>13.505</td>
<td>7.347</td>
</tr>
<tr>
<td>var(Residual)</td>
<td>0.005</td>
<td>0.000</td>
</tr>
<tr>
<td>cov(hosp.exp, _cons)</td>
<td>-1.955</td>
<td>1.052</td>
</tr>
</tbody>
</table>

| Observations | 193 |
| Countries    | 26  |
| Ave. obs. Per country | 7.4 |
B. Preliminary results (model 8) – random slopes
B. Further performance analysis:

• Extend to other dependent variables
  – Stroke case-fatalities, CVD mortality, diabetes outcomes.

• Extend to other independent variables
  – Disease specific hospital expenditure
  – Number of doctors

• Further work on convergence
  – Alternative model specifications
Most of the work ahead of us, but:
- ESC/OECD subproject (Prof Aldo Maggioni)
- Letter of agreement signed/draft protocol

Combines data from:
- ESC’s Heart Failure Long-Term Registry
  - 12 000 patients in 21 countries, including 14 OECD countries
  - Chronic and acute HF
- OECD HSC and CVD/Diabetes survey

To what extent do HSC/policy/organisational aspects influence heart failure treatment guidelines and outcomes?

Outputs: OECD report, paper, Congress of the European Society of Cardiology
Next steps summary

- 2nd CVD/diabetes questionnaire:
  - Please contact the Secretariat (if not already done so)
  - Continue collating and analysing survey questionnaire
  - Interview experts November, December
  - Finalise Q4 2013

- Descriptive analysis:
  - Write up results, integrating survey and interview results
  - Finalise Q1 2014

- Health system performance analysis
  - Draft report by May 2014

- Explaining CVD and diabetes performance (incl. ESC/OECD sub-project)
  - Draft report by May 2014
THANK YOU

CONTACT: KEES VAN GOOL
KEES.VANGOOL@OECD.ORG
References


