Aligning National eHealth policy goals with indicators of eHealth policy effects. Challenges and opportunities

Medinfo NeRN workshop, 21. August 2013

Arild Faxvaag, Christian Nøhr, Kristian Skauli, Sabine Koch and Hannele Hyppönen
Purpose

• Introduce the audience to methods for assessing the content of eHealth policy documents, developing indicators and collecting data on the effects of eHealth policy implementations

• Share our experiences with trying to accomplish this in a Nordic context
Workshop outline

1. Five short presentations introducing the topic (35 min)
   - Hannele Hyppönen: Introduction to the methodology
   - Arild Faxvaag: eHealth policy analysis
   - Sabine Koch: Developing a common set of indicators
   - Hannele Hyppönen: Aligning data sets that already have been collected
   - Kristian Skauli: Experiences with, and lessons learned from the interaction between researchers and policy makers

2. Group work (20 min) to answer two questions
   1. What are the pitfalls when trying to develop a multinational survey for monitoring of policy implementations
   2. How to ensure that the data is useful for policy makers

3. Discussion (20 min)
Part 1

Introduction to the eHealth Indicator Methodology – issues with feasibility
Diffusion of eHealth rapidly increases importance of monitoring the progress and impacts to learn from the initiatives. Policy makers increasingly seek evidence to inform policy development. For this, adequate valid indicators are needed.

Nordic countries have similar health care systems facilitating cross-country learning from eHealth implementation.

All Nordic countries have documented eHealth policies.

There are national level monitoring activities, but at present no
- Harmonisation of data collection or contents for Nordic benchmarking and learning
- Connecting monitoring activities to eHealth policies.
- Possibility of wide range of stakeholders to impact the kind of eHealth indicators used in national surveys, logs and statistics

Nordic countries participate in eHealth indicator work in OECD-context, increasing need for internationally comparable data.
Status and purpose of the network

• Status of the NeIRN
  – The network was born in 2011 from common interests of four Nordic researchers searching communalities in national surveys they represent in Nordic countries
  – It gained an official status as NCM eHealth subgroup with a Mandate from the Nordic Council of Ministers eHealth group, signed by the national ministeries and the NCM eHealth secretariat

• Purpose of the NeIRN
  – To develop, test and assess a common set of indicators for monitoring eHealth availability, use, and impacts in the Nordic countries and Greenland, Faroe and Åland Islands, for use by national and international policy makers and scientific communities to support development of Nordic welfare.
**Indicator definition methodology [9-10]**

- **Defining the context** (human and environmental) for measurement
  - (1) identifying key stakeholders and
  - (2) defining the area(s) or system(s) that are relevant to be studied.

- **Defining the goals**
  - Top-down: analysis of eHealth strategies and interviews of policy makers
  - Bottom-up: review of existing indicator work, peer-reviewed literature and stakeholder priorities

- **Defining methods for indicator selection and categorization.**
  - Grouping preliminary indicators, rating on scientific soundness and feasibility
  - expert panel rating on 3 criteria (relevance, improvement potential, data accessibility)

- **Defining the data**
  - testing the indicators by applying them: collection of feedback from different user groups.
## Data sources for the 4 steps

<table>
<thead>
<tr>
<th>Methodology element</th>
<th>Data sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Defining the <strong>context</strong> (human and environmental) for measurement</td>
<td></td>
</tr>
<tr>
<td>– (1) identifying key stakeholders:</td>
<td>eHealth policies, existing survey target groups</td>
</tr>
<tr>
<td>– (2) defining the relevant area(s) or system(s)</td>
<td>eHealth policies, existing survey variables</td>
</tr>
<tr>
<td></td>
<td>rating results by different stakeholder groups</td>
</tr>
<tr>
<td>• Defining the <strong>goals</strong></td>
<td></td>
</tr>
<tr>
<td>– Top-down</td>
<td>eHealth policy documents</td>
</tr>
<tr>
<td>– Bottom-up</td>
<td>existing surveys (variables)</td>
</tr>
<tr>
<td></td>
<td>eHealth evaluation studies</td>
</tr>
<tr>
<td></td>
<td>rating results by different stakeholder groups</td>
</tr>
<tr>
<td>• <strong>Indicator selection and categorization.</strong></td>
<td></td>
</tr>
<tr>
<td>– Grouping preliminary indicators, rating on scientific soundness and feasibility</td>
<td>eHealth evaluation study groupings</td>
</tr>
<tr>
<td>– rating on 3 criteria (relevance, improvement potential, data accessibility)</td>
<td>rating results by different stakeholder groups</td>
</tr>
<tr>
<td>• <strong>Defining the data</strong></td>
<td></td>
</tr>
<tr>
<td>– testing the indicators by applying them</td>
<td>national surveys, logs, other available data sources</td>
</tr>
<tr>
<td></td>
<td>feedback from different stakeholder groups</td>
</tr>
</tbody>
</table>
Issues with feasibility

• Defining the **context** (human and environmental) for measurement
  – Defining the area(s) or system(s) that are relevant to be studied not clear:
    • should we monitor FUNCTIONALITIES or SYSTEMS/TECHNOLOGIES?
      – E.g. Availability of medication list or CPOE?
    • How do we measure MATURITY of a functionality?
      – E.g. Technical and semantic interoperability (Availability within organisation – nationally – internationally/ codings used)

• Defining the **goals**
  – Documented eHealth strategies are not up-to-date, changing; goals not always clearly defined from the viewpoint of monitoring/measurement => **participation of policy makers essential**!
  – Existing indicator work is not explicit about what and whose goals are to be measured. **Indicators need to be linked to Policy objectives**
  – Different stakeholders may have partially contradicting goals

• Defining **methods for indicator selection and categorization**.
  – Grouping preliminary indicators, rating on scientific soundness and feasibility: no one agreed conceptual system for grouping (IS success model, HTA…)

• Defining the **data**
  – Sources of data varied, very detailed metadata definitions for comparability required, but data still not completely comparable => **footnotes necessary**.
Part 2

Experiences with analyzing and comparing the content of eHealth policy documents
eHealth indicator methodology used in the Nordic work

• Defining the **context** (human and environmental) for measurement
  – identifying key stakeholders and
  – defining the area(s) or system(s) that are relevant to be studied.

• Defining the **goals**
  – Top-down: analysis of (eHealth) strategies and interviews of policy makers
  – Bottom-up: review of existing indicator work, peer-reviewed literature and stakeholder priorities

• Defining **methods for indicator selection and categorization**.
  – Grouping preliminary indicators, rating on scientific soundness and feasibility
  – Rating of importance: Policy makers, practitioners, (patients)

• Defining the **data**
  – testing the indicators by applying them: collection of feedback from different user groups.

Modified from Reed Mark S., Fraser Evan D.G., Dougill Andrew J. An adaptive learning process for developing and applying sustainability indicators with local communities. ECOLOGICAL ECONOMICS 59 (2006) 406–418
Published in Exploring a methodology for eHealth indicator development. Hyppönen H, Ammenwerth E, de Keizer N. Stud Health Technol Inform. 2012;180:338-42
documents ..
Statements and topics usually found in (e-health) policy documents

• where are we? (= status)
• where will we go? (= goals)
• who wants us to get there? (= stakeholders)
• what will we do to reach the destination? (= plans / activities)
• how do we organize the work? (= actors, coordination)
• how to know when we have arrived? (= measures / indicators)
Steps in the analysis of policy documents:

• Selecting which policy documents to analyze
• Deciding on an adequate coding tool
• Conducting a preliminarily reading of the policy documents
• Developing a robust code book / codification system
• Coding the content (statements) and grouping the codes
• Deriving tendencies:
  – Common features
  – Diverging features

- Informasjon er tilpasset situsjonen behandler og annet personell er i, og er utformet på bakgrunn av lokalt og nasjonalt kvalitetsarbeid. Det vil si at arbeid med bl.a. behandlingslinjer, kva-litetsregistre, faglige retningslinjer, prosedyrebeskrivelser og virksomhetsstyring har inngått i arbeidet med å utforme informasjonssystemene.
- Personell i sektoren opplever at informasjonsystemene henger godt sammen med arbeidsrutiner. Dette innebærer:– Dokumentasjonsstøtte som gjør det enkelt å dokumentere.– Prosessstøtte og forskrivningsstøtte som sikrer kontinuitet og sørmløshet i
Nordic e-health policy documents

• Profiles:
  – Targets / objectives
  – Stakeholders identified in policy documents
  – Areas of system / service deployment
  – Focus on infrastructure
  – Focus on governance
Top-down identification of candidate indicators for use in monitoring

• Indicators on
  – Clinicians’ access to and use of functionalities in eHealth systems
    • including support for electronic collaboration
  – Access to common infrastructure / services
  – Secondary use of healthcare data
  – The implementation and use of standards
    • (including information security standards)
  – Patients’ access to, and use of functionalities in PHR systems
Take home message part 3:

- Identification of policy documents to analyze
  - There are important non-e-health policies of relevance to e-health.
- It is possible to do text annotation and analysis
- It is possible to identify candidate indicators that can serve as input in the development of a survey
Part 3

Developing a common set of indicators for assessing the outcomes of eHealth policy implementations in the Nordic countries
Review of existing indicator work: Analysis of eHealth surveys in the Nordic countries and OECD

: OECD

Norway

Denmark

Sweden

Finland

NATIONAL INSTITUTE FOR HEALTH AND WELFARE, FINLAND
Method to define common indicators from surveys

1) First iteration round (surveys not translated)
   - the OECD list of functionalities (from January 2012) used to generate a template
   - Each country representative filled in national survey questions measuring each functionality
   - Specifications, clarifications were made jointly in meetings
   - One question from each OECD-defined category (EHR, HIE, PHR) were selected for testing
     - Availability of medication list (B-Q 2.e/ 3.a.ii/ 4.b-c in April 2013 model survey)
     - Availability of electronic transmission of prescriptions (B-Q 3.a, 3.a.i)
     - Availability of electronic booking of an appointment (C-Q 3)
## Data comprehensiveness

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>Finland</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stakeholder viewpoints</strong></td>
<td>+public sector +private providers</td>
<td>+public sector +private providers</td>
<td>+public sector</td>
<td>+public sector</td>
</tr>
<tr>
<td></td>
<td>+physicians, nurses etc</td>
<td>+physicians only, management/IT</td>
<td>+physicians, nurses, management/IT</td>
<td>+physicians, nurses, management/IT</td>
</tr>
<tr>
<td></td>
<td>No patients</td>
<td>No patients</td>
<td>No patients</td>
<td>No patients</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>National surveys</th>
<th>OECD survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measure definition</strong></td>
<td>Limited comparability!</td>
<td>Focus on functionality</td>
</tr>
<tr>
<td></td>
<td>Focus on IT systems</td>
<td>Focus on functionality</td>
</tr>
</tbody>
</table>

*Log data available but not much used*
1 Context of use
1.1 Respondent’s information
1.2 Organisation information
1.3 IT System information
1.4 Connection
1.5 Network type
1.6 Structures
1.7 Management of IT

2 eHealth Indicators
HC Structural indicators/ impacts
2.1 Availability
2.2 Intensity of use
2.3 technical quality (technical)
2.4 Ease of use
2.5 IT service quality
2.7 Information quality
2.9 System development
2.10 User satisfaction
2.11 IT related job satisfaction
2.12 Challenges
HC Process indicators impacts
2.6 Work process efficiency
Division of work
Conformity to guidelines
HC Output indicators/ impacts
2.8 Benefits
Use of HC services
HC outcome/ health impacts

3 System use (info processing)
3.1 Entering + storing (+ printing)
3.2 Sending/ sharing entered data
3.3 Receiving/ viewing
3.4 Archiving
3.5 Secondary use

4 Processed Information
4.1 individual patient’s clinical information
4.1.1 Detailed clinical notes
4.1.2 Patient summary
4.1.3 Problem list or Diagnoses
4.1.4 vital signs
4.1.5 Allergies
4.1.6 Immunizations
4.1.7 Medication (prescribed)
4.1.8. Medication dispensed
4.1.9 radiological images
4.1.10 radiological results
4.1.11 Laboratory test results
4.1.12 EKG
4.1.13 Nursing documentation
4.1.14 dermatology, pathology, ophthalmology info
4.1.15 monitoring data
4.1.16 Social care data/ Information outside HC

4.2 Patient personal data/
4.2.1 demographics
4.2.2 Patient consents
4.2.3 living will

4.3 Orders, referrals, requests
4.3.1 Radiological order
4.3.2 Laboratory test order
4.3.3 Medication order
4.3.4 Medication renewal
4.3.5 Pathology test order
4.3.6 Order made to nurses
4.3.7 eReferral
4.3.8 Patient's Request
4.3.9 eDischarge letter
4.3.10 Discharge instructions

4.4 Lists
4.4.1 patients due for tests
4.4.2 patients taking a particular medication
4.4.3 medications prescribed from other organisations
4.4.4 patients by diagnosis
4.4.5 patients by lab result

4.5 Decision support information
4.5.1 clinical guidelines
4.5.2 Alerts

4.6 patient-produced clinical data
4.6.1 Measurements (e.g. RR)
4.6.2 Textual data
4.6.3 clinical question

4.7 Information on available services
4.7.1 Yellow pages/health care services
4.7.2 self assessment/risk tests
4.7.3 feedback on care
4.7.5 Appointments

4.8 Statistical information
Next step: Rating of indicators through web survey – validation by different stakeholder groups
Take home message part 3

Use a conceptual framework to group indicators

• It will help to get an overview of the domains to be monitored and it is needed to prioritize the individual indicators.

Break up clinical information processes into individual user activities

• It helps to separate and define individual functionalities (e.g. separation of information viewing from information entering, which are two distinct and different tasks conducted in different phases of the clinical process)
Part 4

First experiences with aligning a set of data that already has been collected with the common indicators as developed in the Nordic project
Three common indicators were identified from the existing Nordic surveys for testing purposes

– **Availability of medication list**
– **Availability of electronic transmission of prescriptions**
– **Availability of electronic booking of an appointment**

Metadata were defined for each indicator for:

– **The relevant area (system) in focus**: medication list, prescription transmission, appointment booking
– **The goal/indicator/stakeholder group**: availability; access to; influenced by
System/ functionality specifications required for comparibility

- Generating (entering data to) the list or viewing the list?
- Content accuracy: Electronic list of medications
  - Including Prescribed or dispensed or OTC or cleared taken by patient?
- Geographical comprehensiveness:
  - Available in own organisation or outside own organisation
    - regionally/ nationally/ internationally
    - in public/ private/ ambulatory/ institutional settings
- Content completeness:
  - Prescribed electronically or by any means?

Goal/ indicator/ stakeholder group specifications required

- Goal: 100% coverage of functionality. Indicator = Availability. Measures: Proportion of
  - organisations offering/
  - clinicians having access to/
  - citizens living in areas where system/ functionality is available
Proportion of public ambulatory care organisations offering clinicians access to a nation-wide, up-to-date list of medications prescribed electronically to patient

1 List includes electronic prescriptions from public ambulatory settings
2 List includes electronic, paper and phone prescriptions from public ambulatory and hospital settings
• Comparability of results requires comparability of data

• Data comparability requires detailed specifications e.g. related to context, format, data quality (e.g. completeness) and maturity level

• Full comparability difficult to achieve => footnotes to define differences
Current work:
Content analysis of existing surveys => longlist of indicators and their foci => grouping of indicators and foci => Stakeholder rating of indicator and foci relevance in the Nordic countries => common Nordic variables to be tested

<table>
<thead>
<tr>
<th>Variable groups</th>
<th>Respondent group:</th>
<th>Scale: Importance</th>
<th>Scale: Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Indicator targets (IT systems and their functionalities of interest for national availability, use and effects-monitoring)</td>
<td>Importance</td>
<td>Frequency</td>
<td>Comments</td>
</tr>
<tr>
<td>1 Background information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Respondent’s information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 Organisation information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 Information on the Manager of IT systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Indicators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Availability (Proportion of organisations/clinicians having access to)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Intensity of use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 (Technical) Quality of IT systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 Interoperability of systems/information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 Usability of IT systems/data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.6 Quality of IT support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.7 Information quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8 Effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on care structures (inputs);</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on service processes;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on service outputs/outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost-savings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact on management of services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Success factors and challenges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9 Other; what</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Indicator targets (IT systems and their functionalities of interest for national availability, use and effects-monitoring)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 IT System types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 Terminal devices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 Standards implemented</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 Information processed electronically</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5 Electronic services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional comments, suggestions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Expected outcomes

• Deliverable I: A rated list of prioritized indicators/systems per respondent group/country. 31.12.2013

• Deliverable II: Common Nordic measures for priority indicators; results of data collection from national surveys; comparison of results. 31.6.2014.


• Deliverable IV: final report: lessons learned and recommendations to achieve a cost-effective and easy-to-use benchmarking information results. 1.5.2015
Part 5
Interaction between researchers and policymakers in the Nordic eHealth Group

Kristian Skauli

Medinfo 21.8.2013
Research influence in policy

Indirect influence  Direct influence

Knowledge foundation in policy
Knowlegde foundation in policy

Systematic work towards knowlegde basis for policy decisions

Main actions in general
• The Norwegian Knowlegde Centre for the Health Cervices
• Norwegian Research Council
• Evaluation programmes

Actions related to eHealth
• Innomed – 10 year long innovation programme (2007-2017) for use case and research driven innovation of health care services
• Evaluation of the Coordination reform (continuity of care, sharing information)
• Logs and registries showing use of eHealth services
## Research influence

**Direct**

- Evaluation of reforms
- Status overview and timelines
- Scientific publications

**Indirect**

- Participation in reference groups
- Public consultation meetings
- Presence in advisory boards and professional bodies
- Presence in decision processes
Research influence *in eHealth*

**Direct**

- eHealth Monitoring
- Reports, recommandations
- *International Summary Care Record research*

**Indirect**

- Advisory boards of authorities, municipalities and health enterprises
  - Example: ”Nasjonal IKT” (hospitals), with group leadership from Norwegian eHealth researcher (Arild)
- Nordic eHealth Research Network
Experience from Nordic eHealth collaboration

Common Nordic issues and possible cooperation is more visible

International comparability is getting closer

Higher quality data (apples or pears?)

Close interaction is good for aligning targets (strong direct and indirect influence!)

Issues...?
  • Administrative, funding and procurements
Workshop outline

1. Five short presentations introducing the topic (35 min)
   - Hannele Hyppönen: Introduction to the methodology
   - Arild Faxvaag: eHealth policy analysis
   - Sabine Koch: Developing a common set of indicators
   - Hannele Hyppönen: Aligning data sets that already have been collected
   - Kristian Skauli: Experiences with, and lessons learned from the interaction between researchers and policy makers

2. Group work (20 min) to answer two questions
   1. What are the pitfalls when trying to develop a multinational survey for monitoring of policy implementations
   2. How to ensure that the data is useful for policy makers

3. Discussion (20 min)
Workshop outline

1. Five short presentations introducing the topic (35 min)
   - Hannele Hyppönen: Introduction to the methodology
   - Arild Faxvaag: eHealth policy analysis
   - Sabine Koch: Developing a common set of indicators
   - Hannele Hyppönen: Aligning data sets that already have been collected
   - Kristian Skauli: Experiences with, and lessons learned from the interaction between researchers and policy makers

2. Group work (20 min) to answer two questions
   1. What are the pitfalls when trying to develop a multinational survey for monitoring of policy implementations
   2. How to ensure that the data is useful for policy makers

3. Discussion (20 min)
Interested in more information about the Nordic eHealth indicator work?

1) Read the report

2) Google "Nordic eHealth Research Network" OR go directly to

3) Follow scientific publications:
   • Nordic eHealth Indicators: Organisation of research, first results and plan for the future. Hannele Hyppönen, Arild Faxvaag, Heidi Gilstad, Gudrun Audur Hardardottir, Lars Jerlvall, Maarit Kangas, Sabine Koch, Christian Nøhr, Thomas Pehrsson, Jarmo Reponen, Åke Walldius, Vivian Vimarlund. Medinfo 2013 conference. Accepted as a full paper