Nordic eHealth Indicators:

Organisation of research, first results and plan for the future

NATIONAL INSTITUTE FOR HEALTH AND WELFARE, FINLAND
Sources: Nordic Council of Ministers Publication 2013/522; workplan for 2013-2015

Status and purpose of the network

• Status of the NeRN
  – The network was born in 2011 from common interests of four Nordic researchers searching communalities in national surveys they represent in Nordic countries
  – In 2012 it gained an official status as Nordic Council of Ministers eHealth subgroup with a Mandate from the eHealth group, signed by the national ministeries and the NCM eHealth secretariat

• Purpose of the NeRN
  – 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.
Current situation with monitoring eHealth attainments

• Lack of common, agreed measures for policy goals
• No transparent connection between measures used and eHealth policies

=> no possibility for systematic comparison of results
eHealth indicator methodology used in the Nordic work

1. 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.

2. Defining the **goals**
   4. Top-down: analysis of (eHealth measurement
      - defining the area(s) or system(s) that are relevant to be studied.
      2. literature and stakeholder priorities
   3. Top-down: analysis of (eHealth
   Bottom-up: review of existing indicator work, peer-reviewed literature and stakeholder priorities

3. Defining the **data**
   4. Defining the data
      - rating on scientific soundness and feasibility
      - Rating of importance: Policy makers, practitioners, researchers

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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.
Policy analysis
Contents of the policy documents

• Where are we (status)
• Where are we aiming (top-down goals)
• Who are interested in the goals (stakeholders)
• What do we do to get there (plans and activities)
• How can we know when we have arrived (indicators)
• How do we organize the activities to achieve the goals
Overall strategy profiles in different countries

improving interoperability, process support, quality and efficiency.

mentioning of different stakeholders in the strategy documents

Stakeholder involvement

efficiency, making data available for leadership and management, information security and privacy

Business support

usability of, and access to systems and information, healthcare quality, supporting research and education and improving availability of healthcare data for secondary use

improving IT-system architecture

Technical infrastructure

Governance

Clinical infrastructure

- Finland
- Sweden
- Denmark
- Norway
Results of the policy analysis

• Statements about general aims / goals
  – Statements about healthcare services
    • improving effectiveness and quality; improving research and education; bringing about change in healthcare organisations
  – Statements about health-IT services
    • improving access to relevant health information; improving process support; making more data available for secondary use; improving usability; improving information infrastructure
  – Statements about the empowerment and activation of patients/citizens

• High degree of conformity — Few differences between countries
  • Improving usability: Sweden and Denmark
  • Improving process support and making more data available for secondary use: Denmark and Norway
  • Improving the IT-architecture: Finland (Norway and Sweden)
Results of the policy analysis (cont.)

- Plans / means to achieve the particular goals
  - Plans for establishing IT architectures and IT-services
    • both for clinicians and patients
  - Plans for standardization
  - Plans to enhance information security and privacy
  - Plans to improve access to data for secondary use
  - Plans for establishing law and regulatory frameworks
- Establishing common IT-services: Finland
- Developing IT-architectures: Finland and Norway

- Systematic monitoring of attainment of policy goals not generally included in eHealth policies
Analysis and comparison of content of policies

- Stakeholders identified in the policy documents
  - clinicians; patient/citizen; healthcare leaders; health policy makers; IT-service operators; private vendors of healthcare services

- Total numbers of stakeholders identified:
  - Finland: 2
  - Denmark: 6
  - Norway: 6
  - Sweden: 5
Top-down identification of candidate indicators for use in monitoring

• Clinicians’ access to and use of functionalities in eHealth systems
  – including support for electronic collaboration
• Access to common infrastructure / services
• Indicators on secondary use of healthcare data
• Indicators on the implementation and use of standards
  – (including information security standards)
• Patients’ access to, and use of functionalities in PHR systems => Patient empowerment
• Improving effectiveness of health care
• Improving health care productivity, cost-efficiency – politically inappropriate goals to document in policies?
Review of existing indicator work: Analysis of national eHealth surveys in the Nordic countries and the OECD model survey

Norway

OECD

Denmark

Sweden

Finland

THL

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– Public sector, doctors viewpoint relatively well represented in the Nordic surveys
– Finland and Denmark survey also private providers, all but Denmark also survey organisations (Managers/IT leaders) viewpoints, all but Finland survey also other medical staff, mainly nurses and medical secretaries, nobody surveys patients viewpoints
– Measures and their definitions (e.g. medication list) varied => only limited comparability, include ”silent knowledge” e.g. on data quality that needs to be known to interpret results.
– Data available also from logs, not used much, need policy level decisions to become available for research, quality varied, detailed specifications needed before extracting
Example of work needed to define one national indicator: Availability of medication list in electronic format

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?
- Content completeness:
  - Prescribed **electronically** or by **any means**?
- Level of integration/ interoperability/ Geographical comprehensiveness:
  - Available in **own** organisation or **outside** own organisation
    - regionally/ nationally/ internationally
    - in public/ private/ ambulatory/ institutional settings

Goal/ indicator/ stakeholder group specifications: Availability

- Measure 1: proportion of HC organisations offering the functionality
- Measure 2: proportion of clinicians having access to the functionality
- Measure 3: proportion of 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
Indicator identification from surveys
### What is currently being measured in the Nordic surveys? What is missing?

<table>
<thead>
<tr>
<th>Indicator / measure</th>
<th>Fi</th>
<th>No</th>
<th>DK</th>
<th>SW</th>
<th>OECD</th>
</tr>
</thead>
<tbody>
<tr>
<td>System availability (proportion of organisations/clinicians/ patients having)</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Information/functionality availability</td>
<td>X</td>
<td>X</td>
<td>(X)</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Intensity of use (proportion of transactions performed electronically)</td>
<td>X</td>
<td>X</td>
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<tr>
<td>IT support quality (UX = proportion of clinicians experiencing)</td>
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<tr>
<td>IT system quality (e.g. reliability, down-time) (UX)</td>
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<tr>
<td>System integration/ interoperability/ info sharing</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Information quality (UX)</td>
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<td>Usability (UX)</td>
<td>X</td>
<td>X</td>
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<td>IT costs (investment/ maintenance budget)</td>
<td>X</td>
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<tr>
<td>Benefits (general) (UX)</td>
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<td>professional development support (UX)</td>
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<tr>
<td>Productivity/ efficiency gains (e.g. avoidance of duplicate tests)</td>
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<td>Support for collaboration/ care continuity (UX)</td>
<td>X</td>
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<td>Patient safety (several variables)</td>
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<tr>
<td>Patient centredness (UX)</td>
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<tr>
<td>Challenges/ most successful functionalities (UX)</td>
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<td>X</td>
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</tbody>
</table>
What is there, what is missing?

• Focus on ICT availability, use and system interoperability - based on self-reports, log data

• Some indicators on ICT usability, impacts on HC processes, outputs (e.g. productivity, safety, care coordination, secondary use) – based on User experience

• Completely missing so far:
  – HC effectiveness or health impact measures
    • Increased implementation of eServices to support empowerment of patients => e.g. balance of care-measures possible e.g. for chronical illnesses
  – Exploitation of register data as source for composite- and/ or proxy indicators
Current work:
Content analysis of existing Nordic + OECD surveys + literature => longlist of indicators and systems => Stakeholder rating of indicator and system relevance in the Nordic countries => common Nordic variables to be tested

<table>
<thead>
<tr>
<th>Variable groups</th>
<th>Respondent group</th>
<th>Importance</th>
<th>Frequency</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>1 Background Information</td>
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<tr>
<td>1.1 Respondent's information</td>
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<tr>
<td>1.2 Organisation information</td>
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<tr>
<td>1.3 Information on the Manager of IT systems</td>
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<tr>
<td>2 Indicators</td>
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<td>2.1 Availability (Proportion of organisations/clinicians having access to)</td>
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<td>2.2 Intensity of use</td>
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<tr>
<td>2.3 (Technical) Quality of IT systems</td>
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<td>2.4 Interoperability of systems/information</td>
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<td>2.5 Usability of IT systems/data</td>
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<td>2.6 Quality of IT support</td>
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<td>2.7 Information quality</td>
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<td>2.8 Effects</td>
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<td>2.9 Impacts on care structures (inputs):</td>
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<td>2.10 Impacts on service processes;</td>
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<td>2.11 Impacts on service outputs; outcomes</td>
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<td>2.12 Cost-savings</td>
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<td>2.13 Impacts on management of services</td>
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<tr>
<td>2.14 Main success factors and challenges</td>
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<tr>
<td>2.15 Other, what</td>
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<tr>
<td>3 Indicators targets (IT systems and their functionalities of interest for national availability, use and effects monitoring)</td>
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<tr>
<td>3.1 IT System types</td>
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<td>3.2 Terminal devices</td>
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<td>3.3 Standards implemented</td>
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<td>3.4 Information processed electronically</td>
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<td>3.5 Electronic services</td>
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<tr>
<td>4 Additional comments, suggestions</td>
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</table>

Groups of Indicators (including impacts on outcomes of care)

Systems, functionalities in focus/ associated with impacts
The results will be used to analyse conformity and differences in importance of measuring different elements in the Nordic countries

– Within stakeholder groups
– Between stakeholder groups
– Between countries

Combining the most policy-relevant and highly rated elements for goal/indicator-items and system/area-items to be implemented in national surveys

1) Country-specific indicators for national monitoring
2) Common Nordic indicators for Nordic benchmarking
3) OECD-level indicators for international benchmarking
Take-home message 1

Indicator development requires a systematic, transparent methodology and collaboration between stakeholders.

- The indicator methodology is a good way to build collaboration and to reach consensus on important indicators (goals) and their focus areas/systems.

- Participation of policy makers has proven essential for getting the work started, participation of policy makers and other stakeholders to rate and comment on indicators is ongoing at present.

- Researchers (evidence_collectors) act as bridge-builders between different stakeholder groups.
Take home message 2

Indicators need to be linked to Policy objectives

- Policy analysis helped to identify issues not monitored currently (e.g. Effectiveness, Secondary use of data, common eHealth services, standards and patient empowerment)

- The importance of indicators is likely to change over time: Even in the Nordic Countries, eHealth policies have different emphasis in different countries, due to differences in the context, technologies and implementation status => continuous collaboration with policy makers to provide meaningful data
Take home message 3

Comparability of results requires comparability of measures/variables

- Variable comparability requires detailed specifications of the functionality as well as detailed specifications of the actual indicator/measure
- Full comparability hard to achieve, make notes for exceptions
- Start with few well defined indicators for which data is relatively easily available rather than too many, ambiguous, hard-to-measure ones!
- Impact indicators need to be accompanied by availability and use-indicators (allows comparison of impacts between users/non-users)
Thank you!

Hannele.hypponen@thl.fi; arild.faxvaag@ntnu.no; Christian Nøhr cn@plan.aau.dk; vivian.vimarlund@liu.se; Guðrún Auður Harðardóttir audur@landlaeknir.is

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 Jerlvell, Maarit Kangas, Sabine Koch, Christian Nøhr, Thomas Pehrsson, Jarmo Reponen, Åke Walldius, Vivian Vimarlund. Medinfo 2013 conference. Accepted as a full paper