



EUROPEAN HEALTH CARE OUTCOMES,
PERFORMANCE AND EFFICIENCY

Costs and quality in Nordic hospitals

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Motivation

- Previous work shows considerable differences in hospital productivity,
 - within countries and
 - between countries.
- Can this be related to quality?
- Are best performing hospitals good at quality and costs?
 - Or, is there a trade-off between costs and quality
- Need
 - Directly comparable output measures
 - Large Nordic countries use variants of NOR-DGR
 - Hospital level quality/outcome measures
 - Patient level data
 - Multilevel analysis
- No results yet, data almost ready

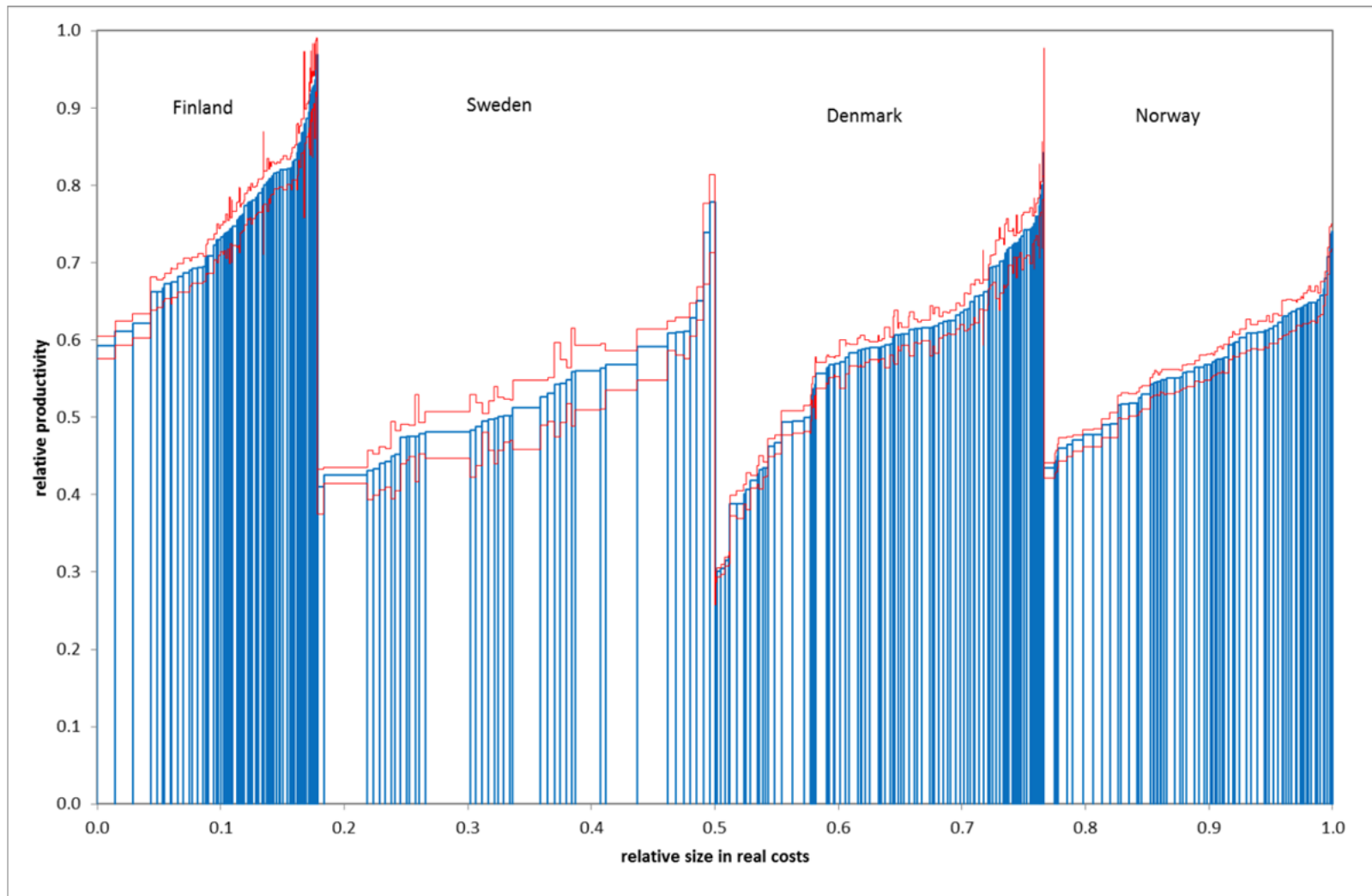
WP 8:

Cost and quality at the hospital level

■ Objectives

- To develop measures of patient-level indicators of the quality of acute somatic care at the hospital level, based on patient register data and linked sources.
- To show how standard performance measurement methods can be extended to multi-level analysis of patient-level quality indicators and hospital level activity and cost data.
- To use such methods on Nordic data to show to what extent the multi-level analysis modifies the performance results and makes it possible to estimate the cost of quality.

Productivity levels in Nordic hospitals 2005-2007 (Bootstrapped DEA estimates with 95% CI)



Mean productivity and decomposition (Bootstrapped DEA estimates with 95% CI)

	Finland	Sweden	Denmark	Norway
Productivity with common reference frontier	79,1 % (77,0 - 81,0)	52,6 % (49,8 - 54,2)	57,7 % (55,4 - 59,6)	56,6 % (53,0 - 58,6)
Decomposition of productivity				
Productivity of country specific frontier	100,0 % (99,8 - 100,0)	65,1 % (62,3 - 68,7)	78,5 % (75,8 - 81,4)	68,6 % (66,1 - 72,7)
Scale efficiency	89,7 % (87,8 - 91,8)	94,3 % (91,9 - 96,3)	93,7 % (91,9 - 95,2)	94,2 % (93,1 - 95,1)
Cost efficiency	89,8 % (88,9 - 90,6)	84,1 % (81,7 - 86,2)	77,1 % (75,4 - 78,6)	89,7 % (88,6 - 90,6)

Statistical associations with productivity or efficiency

- Positive association with
 - Outpatient share
- Negative association with
 - Length of stay (LOS)
 - (Traveling time)
- No association with
 - Case mix index
 - Capital city
 - University hospital
 - (Activity based financing)
- Results robust to choice of method
 - Parametric: Stochastic Frontier Analysis (SFA)
 - Non-parametric: Bootstrapped Data Envelopment Analysis (DEA)

- Can quality differences be (part of) the explanation?

Discarded quality indicators

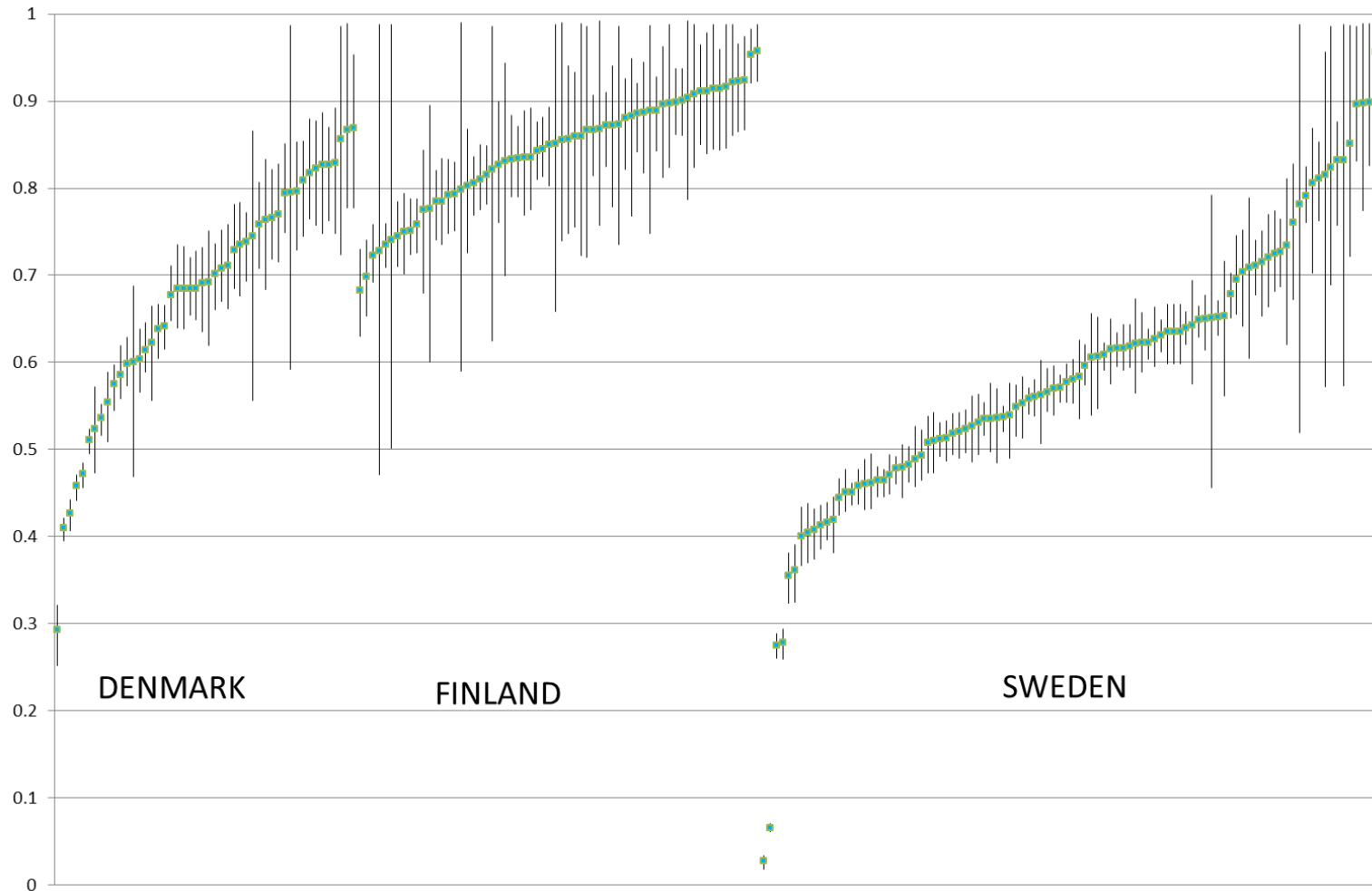
Indicator	Definition	Comment	Availability
Previously discarded			
Amenable/avoidable deaths	Deaths in specific subgroups where it is reasonable to expect deaths to be averted	Subgroups are not representative of hospital activity as a whole.	2008-2009.
Workforce participation	Rate of workforce participation e.g. during next 12 months to total discharges.	Dto. Might use labour income instead of participation.	Difficult to link in Sweden and Denmark. One year lag might in any case be insufficient.
Patient satisfaction	Survey data on specific questions	Probably not available unless collected in other WPs	Only intermittent surveys. Not comparable data for all countries and hospitals.
Single room Corridor patients		No register data? Probably only counts at certain times	Dto Dto
Infections in hospital	Infections of certain types acquired in hospital	Registered?	Dto
Discharge summary availability	Time from discharge to discharge summary is sent GP		Only in Norway and Denmark.
Dischargeable patients	Number of day-patients staying in hospital after discharge is possible		No.

Quality indicators still included

Indicator	Definition	Comment	Availability
Currently included			
Readmission	Unplanned admission within 30 days of previous discharge	Should be in patient data, if linked across years and hospitals.	2008-2009. Complete years only from 2008 in Norway
Waiting time	Number of days from referral to admission	Dto. Many reasons to think this is not a good indicator.	2008-2009. Complete years only from 2008 in Norway.
In hospital waiting for procedure	Date from admission to first procedure	Might be unreliable.	2008-2009. Complete years only from 2008 in Norway. Impossible in Sweden.
In-hospital mortality	Rate of dead on discharge to total discharges	Dto. See also note by Linna.	2008-2009.
Out of hospital mortality	Rate of dead within e.g. 1 year of discharge to total discharges	Need external data registers to be linked, perhaps to short time for 2009? Sufficient to use population register, need not cause of death.	Death data from 2008-2010 to be linked to patients in 2008-2009. Complete years only from 2008 in Norway.
Comorbidity	Charlson comorbidity index	Algorithm has to be provided	2008-2009 if possible to derive from data. Complete years only from 2008 in Norway.
Patient safety	Patient safety indices	Algorithms have to be provided	2008-2009 if possible to derive from data. Complete years only from 2008 in Norway.

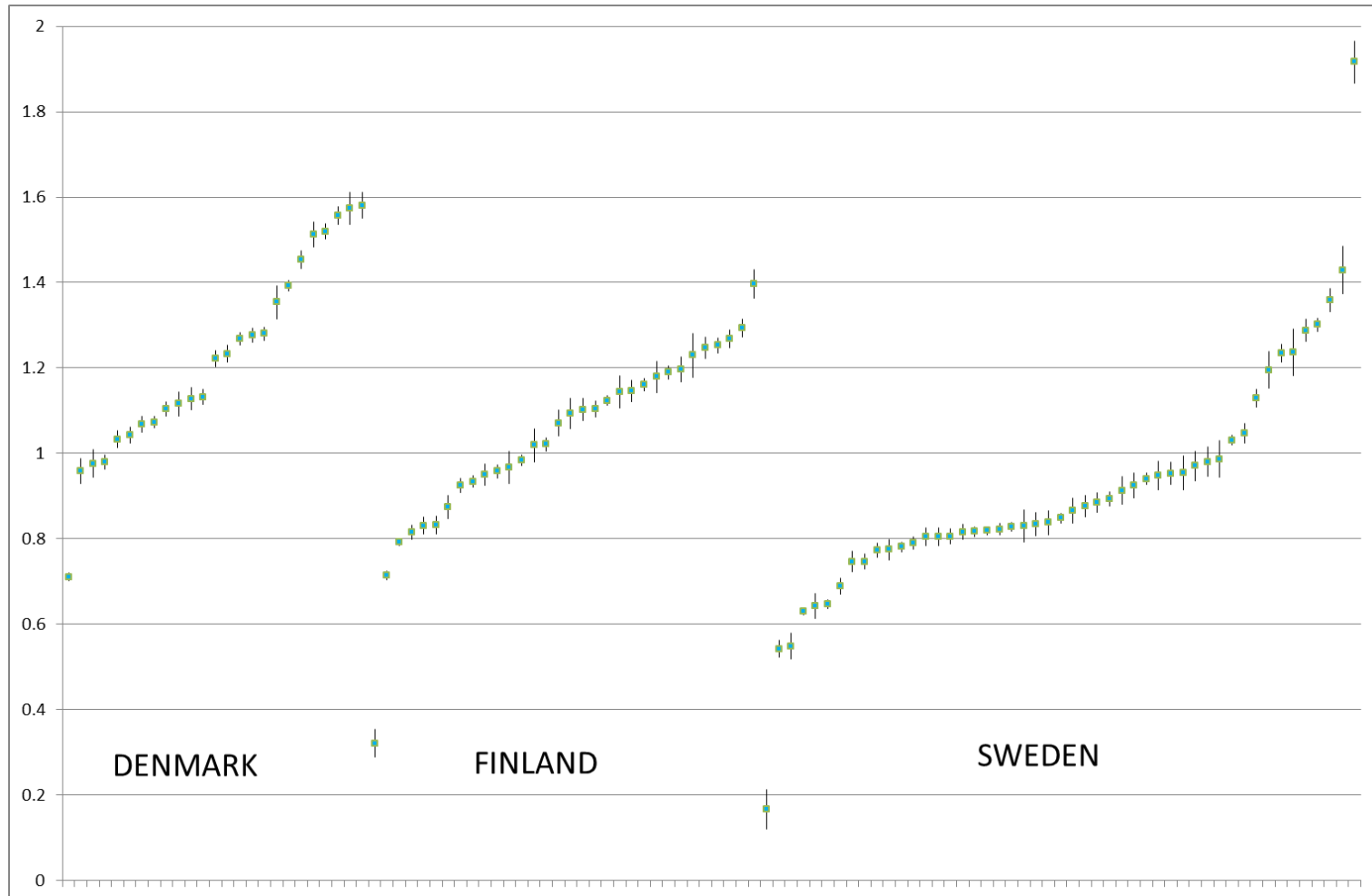
Preliminary results for 2008-2009 data

Productivity



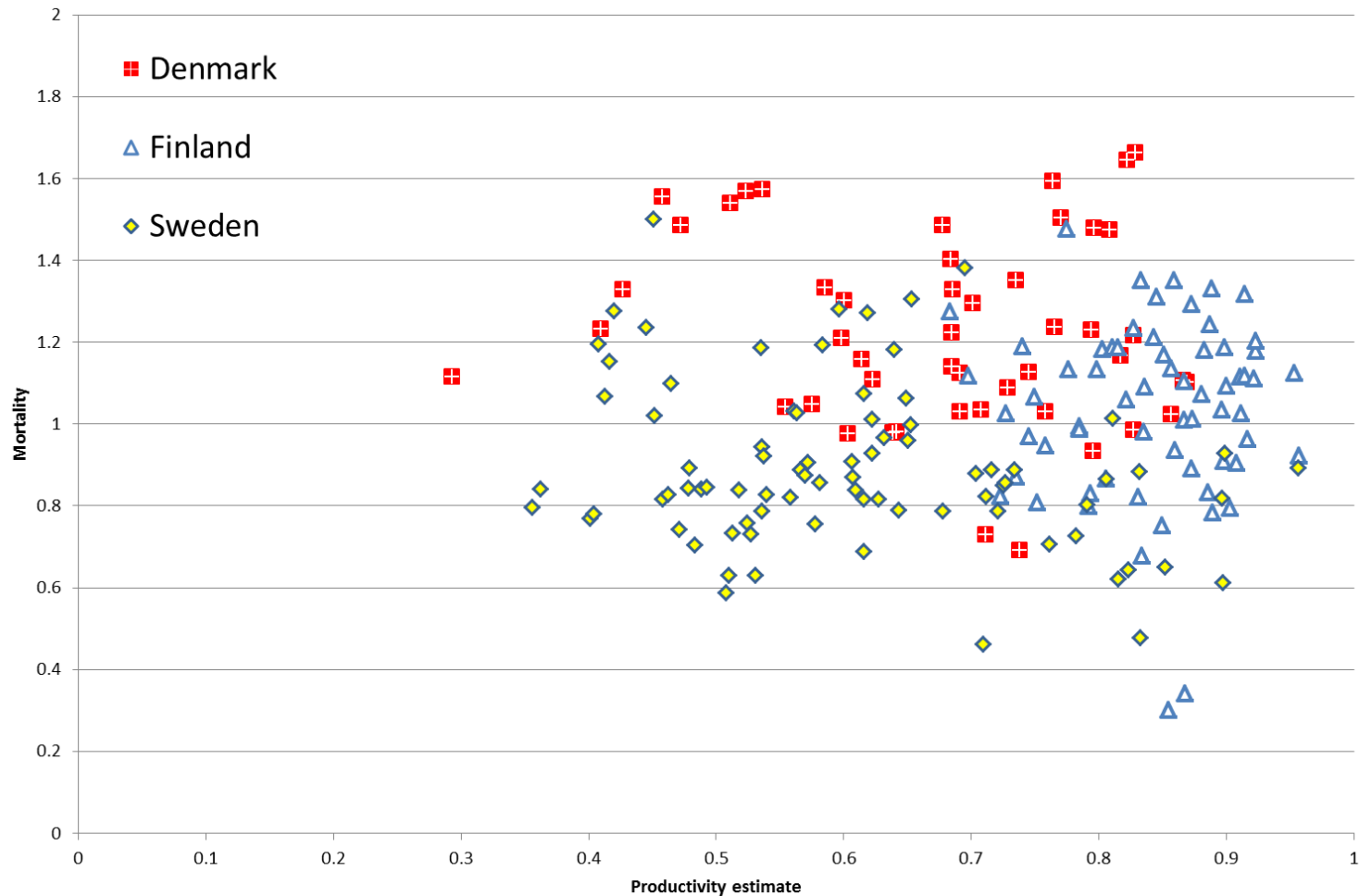
Preliminary results for 2008-2009 data

30-day Mortality, Adjusted for DRG



Preliminary results for 2008-2009 data

Productivity quality trade-off



Conclusions

- Large productivity differences
 - Between hospitals
 - Between countries
- Large mortality differences
 - Between hospitals
 - Between countries
- Some trade-off between mortality and productivity at the hospital level
 - Driven by country differences
- Further case-mix correction needed
- Further quality indicators need examining