

Health care performance – How to measure and improve it?

Andrew Street



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■



How to **improve** performance



As analysts we should:

- Question our **assumptions**
- **Measure accurately**
- **Communicate** clearly
- Address the most pressing **challenges**
- Get involved in **incentive** design

Who is setting the rules?



“The **regulator's** objective is to maximize **social welfare**”

Politicians exert significant **influence** over the health care system

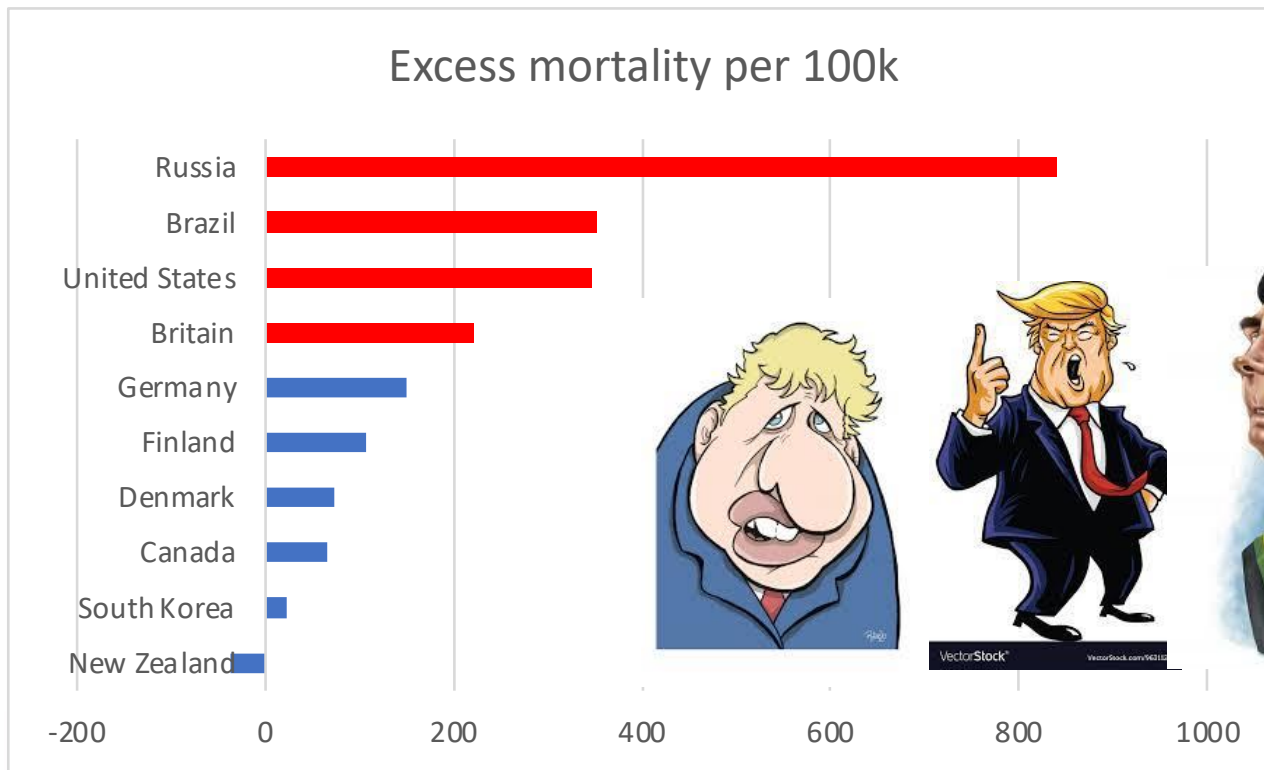
Are they prioritising social welfare ahead of **self-interest**?

Self-Interested Bank Regulation

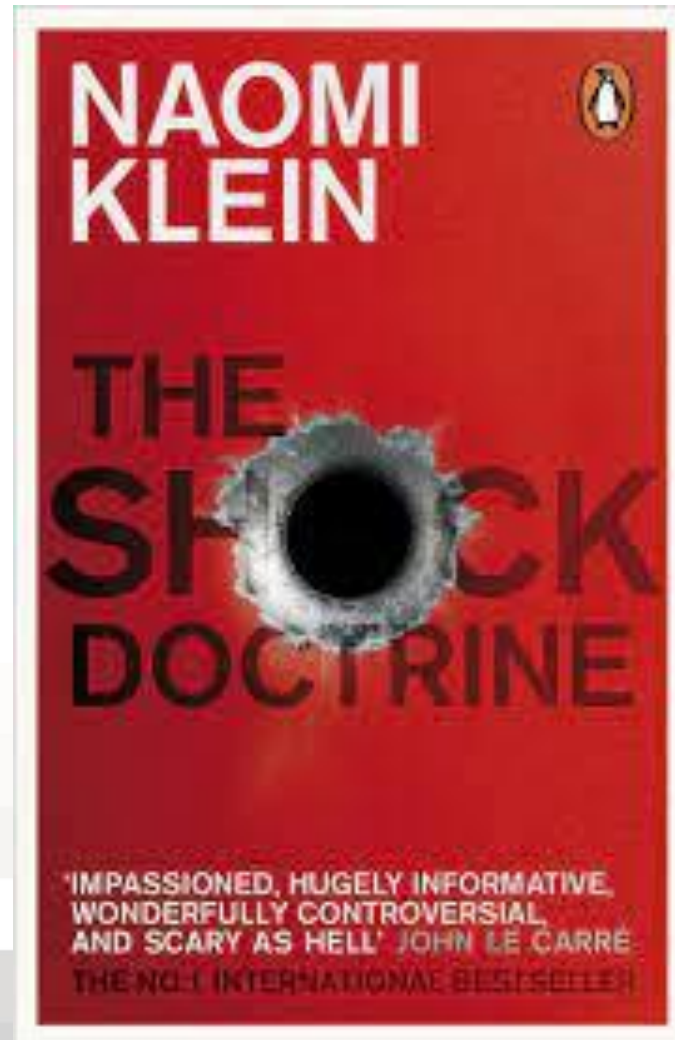
By ARNOUD W. A. BOOT AND ANJAN V. THAKOR*

This paper formalizes the notion that a bank regulator may pursue self interest rather than social welfare, and examines the

Excess mortality from COVID19



Disaster capitalism



Who is setting the rules?



“The **regulator's** objective is to maximize **social welfare**”

Politicians exert significant **influence** over the health care system

Are they prioritising social welfare ahead of **self-interest**?

How does their choice influence the **performance** of the health system and the organisations and staff within it?

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How to measure performance



Performance analysis should:

- Exploit existing **data sets**
- Zone in on **specific areas** of activity
- Focus on measures **attributable** to organisational effort
- Capture **health outcomes**
- Recognise that health care organisations pursue **multiple objectives**
- Recognise that health care is delivered across **multiple settings**

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High quality registry data



Comparing Properties of Audit Data and Routinely Collected Register Data in Case of Performance Assessment of Hip Fracture Treatment in Finland

R. Sund , I. Nurmi-Lüthje , P. Lüthje , S. Tanninen , A. Narinen , I. Keskimäki

- “**Completeness** of the register data is very good.
- The **accuracy** of easily measurable variables in the register is at least 95%.
- The **agreement** between register and audit data was 86.3% for detailed hip fracture diagnosis”

Monitoring the performance of hip fracture treatment in Finland

REIJO SUND¹, MERJA JUNTUNEN¹, PETER LÜTHJE², TIINA HUUSKO³
& UNTO HÄKKINEN¹

Direct Costs of Patients With Stroke Can Be Continuously Monitored on a National Level Performance, Effectiveness, and Costs of Treatment Episodes in Stroke (PERFECT Stroke) Database in Finland

Atte Meretoja , Markku Kaste, Risto O. Roine, Merja Juntunen, Miika Linna, Matti Hillbom, Reijo Marttila, Terttu Erilä, Aimo Rissanen, Juhani Sivenius and Unto Häkkinen

Individual and Area-level Factors Contributing to the Geographic Variation in Ambulatory Care Sensitive Conditions in Finland *A Register-based Study*

Markku Satokangas, MD,† Martti Arffman, MSc,† Harri Antikainen, PhD,‡
Alastair H. Leyland, PhD,§ and Ilmo Keskimäki, MD, PhD†||*

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Health Economics

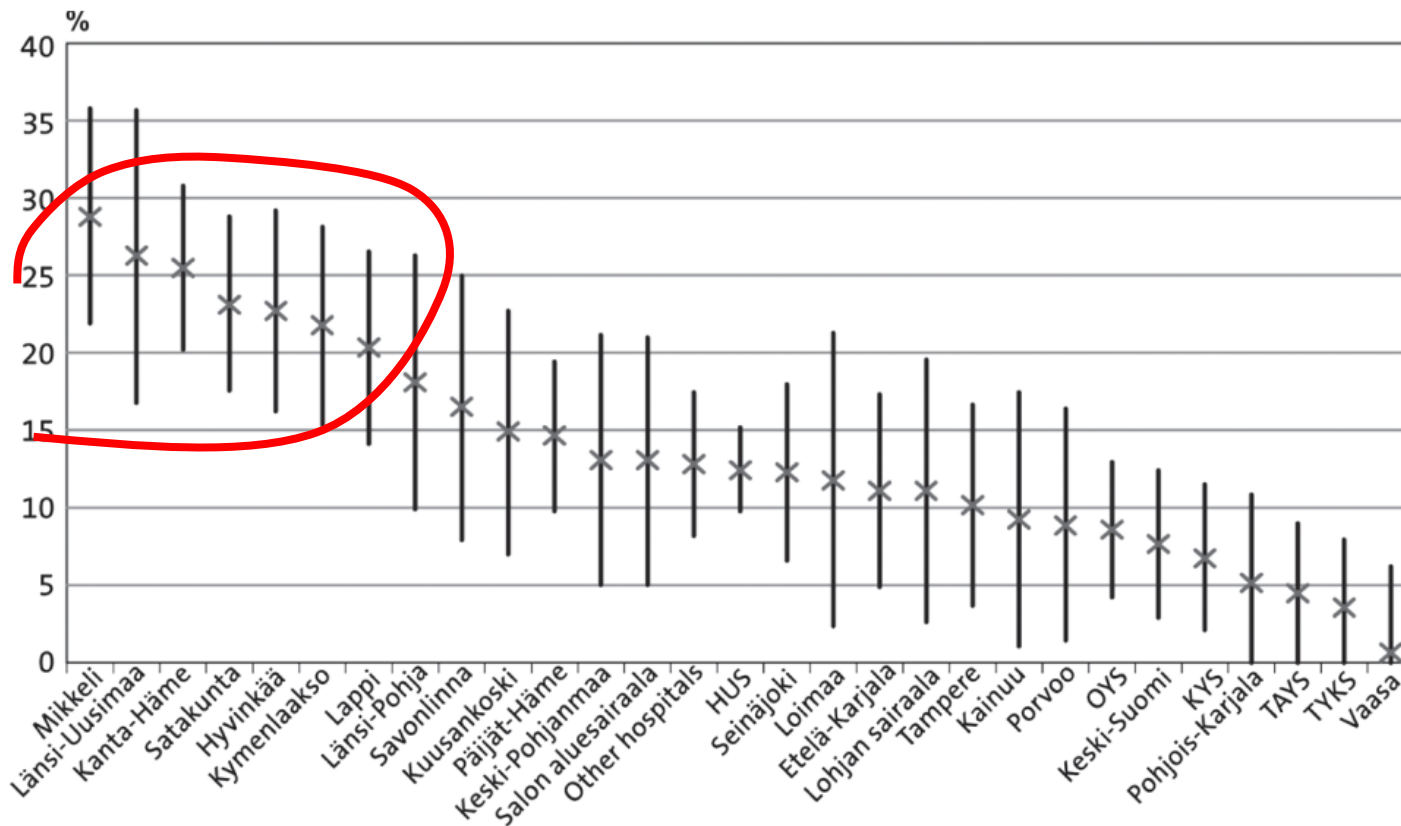
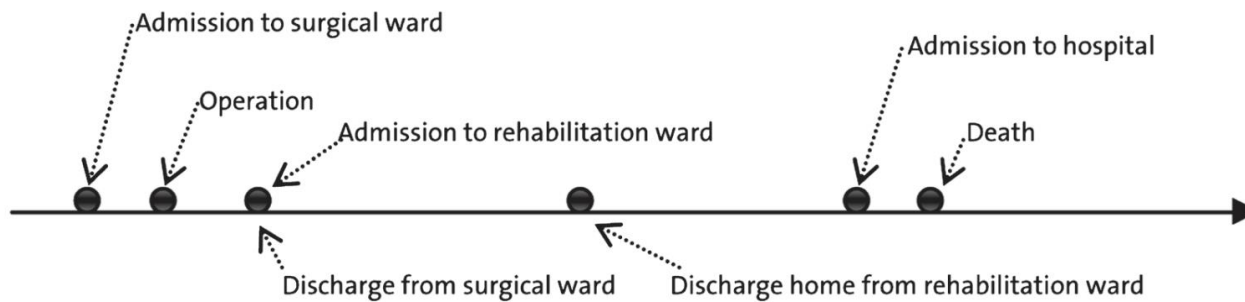
Editorial | [Free Access](#)

The market for efficiency analysis of health care organisations

Bruce Hollingsworth, Andrew Street 

“Efficiency analyses tend to focus on the **organisation** as the unit of analysis, but this may provide ... **little insight** about where technical improvements should be made ... the analysis needs to be more **specific**”

Hip fracture operative delays



EuroDRG project



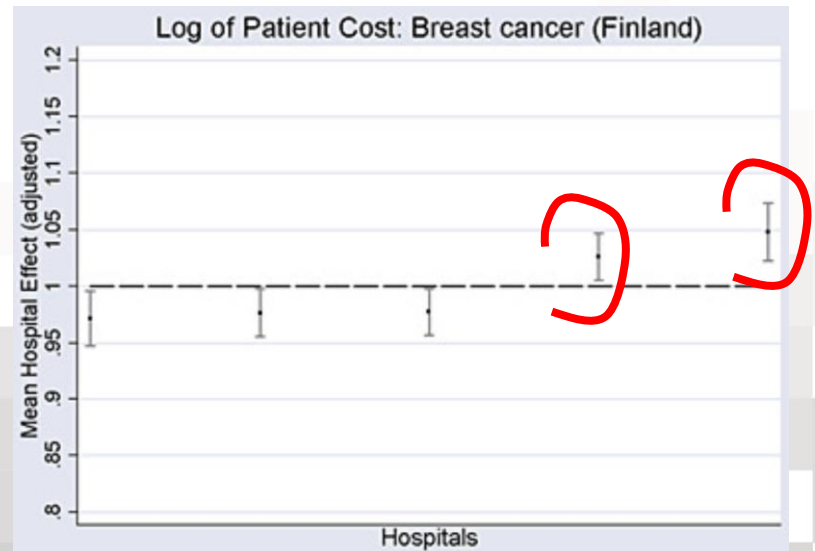
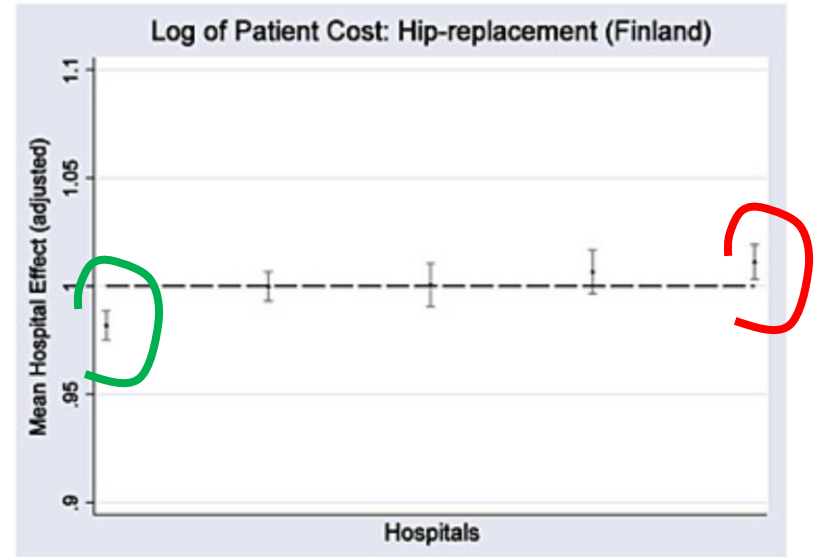
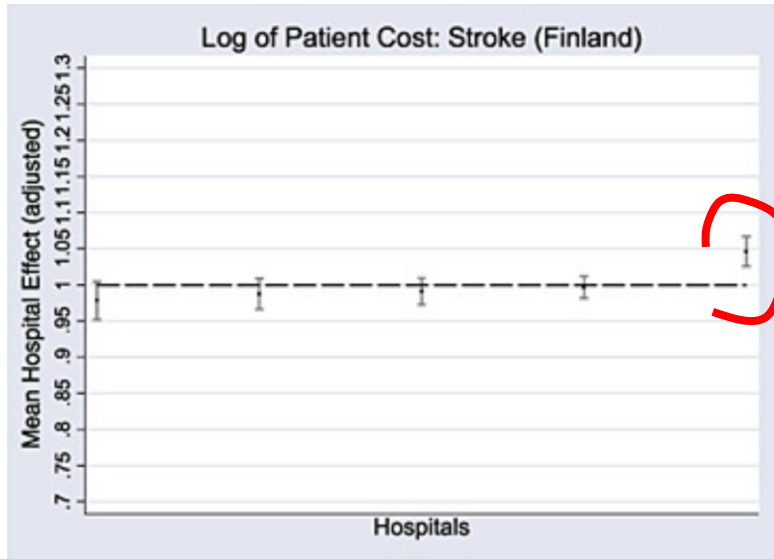
Health Economics

Supplement Article | [Free Access](#)

PATIENT CLASSIFICATION AND HOSPITAL COSTS OF CARE FOR STROKE IN 10 EUROPEAN COUNTRIES

Mikko Peltola , on behalf of the EuroDRG group

Hospital variation in costs



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Multidimensional performance assessment



Health Economics

RESEARCH ARTICLE |  Open Access |  

Multidimensional performance assessment of public sector organisations using dominance criteria

Nils Gutacker , Andrew Street

Multiple objectives



Data for hip replacement patients:

- Apr 2009 – Mar 2012
- 96k patients in 252 hospitals and treatment centres
- Health outcome: EQ5D & **Oxford Hip Score**
- Length of Stay
- Waiting time prior to admission
- Emergency readmission within 28 days of discharge

Health outcome and LoS



$$\text{outcome}_{ij} = \alpha_1 + \beta_n X_{nij} + \gamma_{1j} + \varepsilon_{1ij}$$

patient i
in hospital j

Risk
adjusters

Hospital
effect

Statistical
error

$$\text{LoS}_{ij} = \alpha_2 + \beta_m X_{mij} + \gamma_{2j} + \varepsilon_{2ij}$$

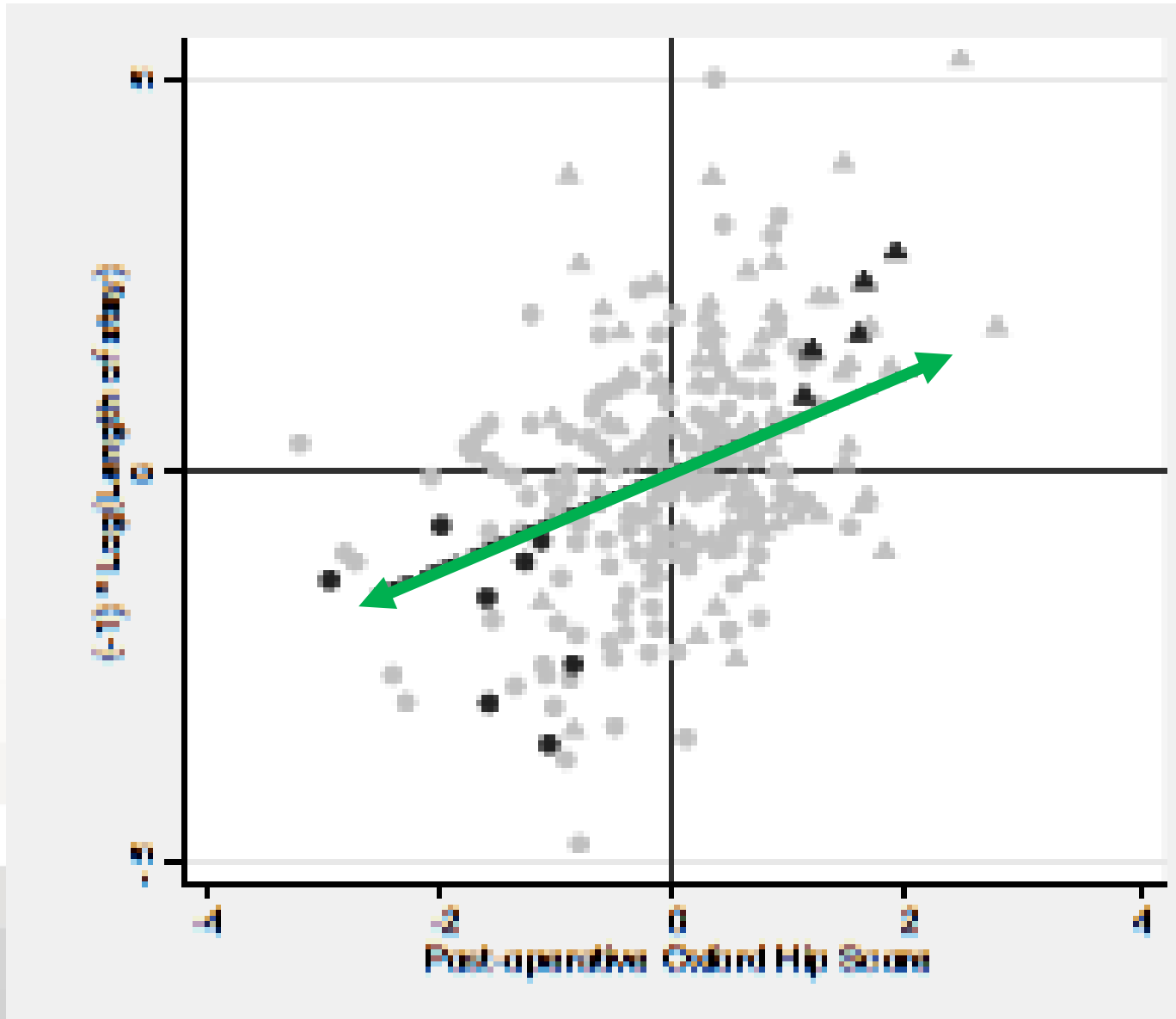
Health outcome and LoS

$$\text{outcome}_{ij} = \alpha_1 + \beta_n X_{nij} + \gamma_{1j} + \varepsilon_{1ij}$$

Hospital
effect

$$\text{LoS}_{ij} = \alpha_2 + \beta_m X_{mij} + \gamma_{2j} + \varepsilon_{2ij}$$

LoS and outcomes



Multiple objectives

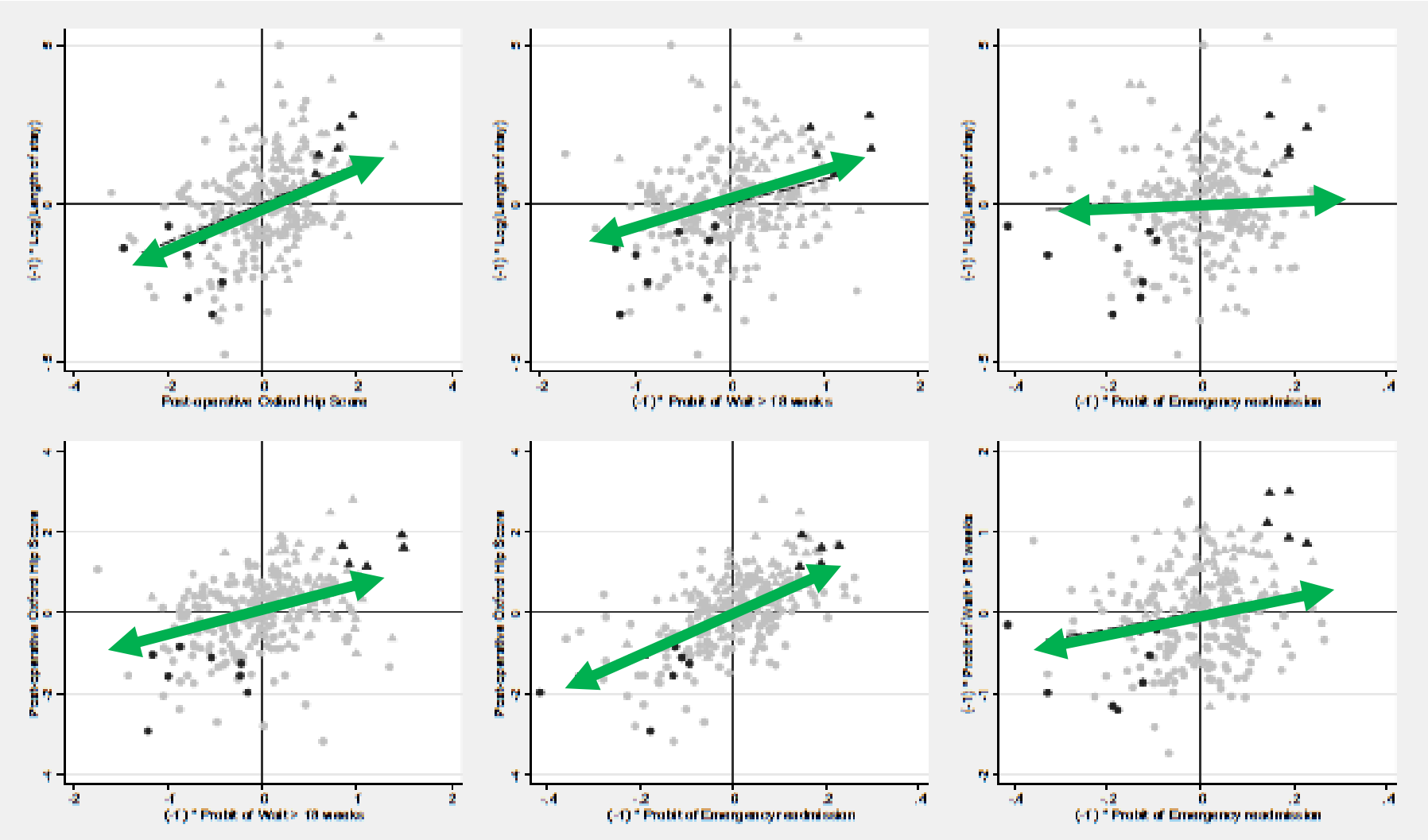
$$\text{outcome}_{ij} = \alpha_1 + \beta_n X_{nij} + \gamma_{1j} + \varepsilon_{1ij}$$

$$\text{LoS}_{ij} = \alpha_2 + \beta_m X_{mij} + \gamma_{2j} + \varepsilon_{2ij}$$

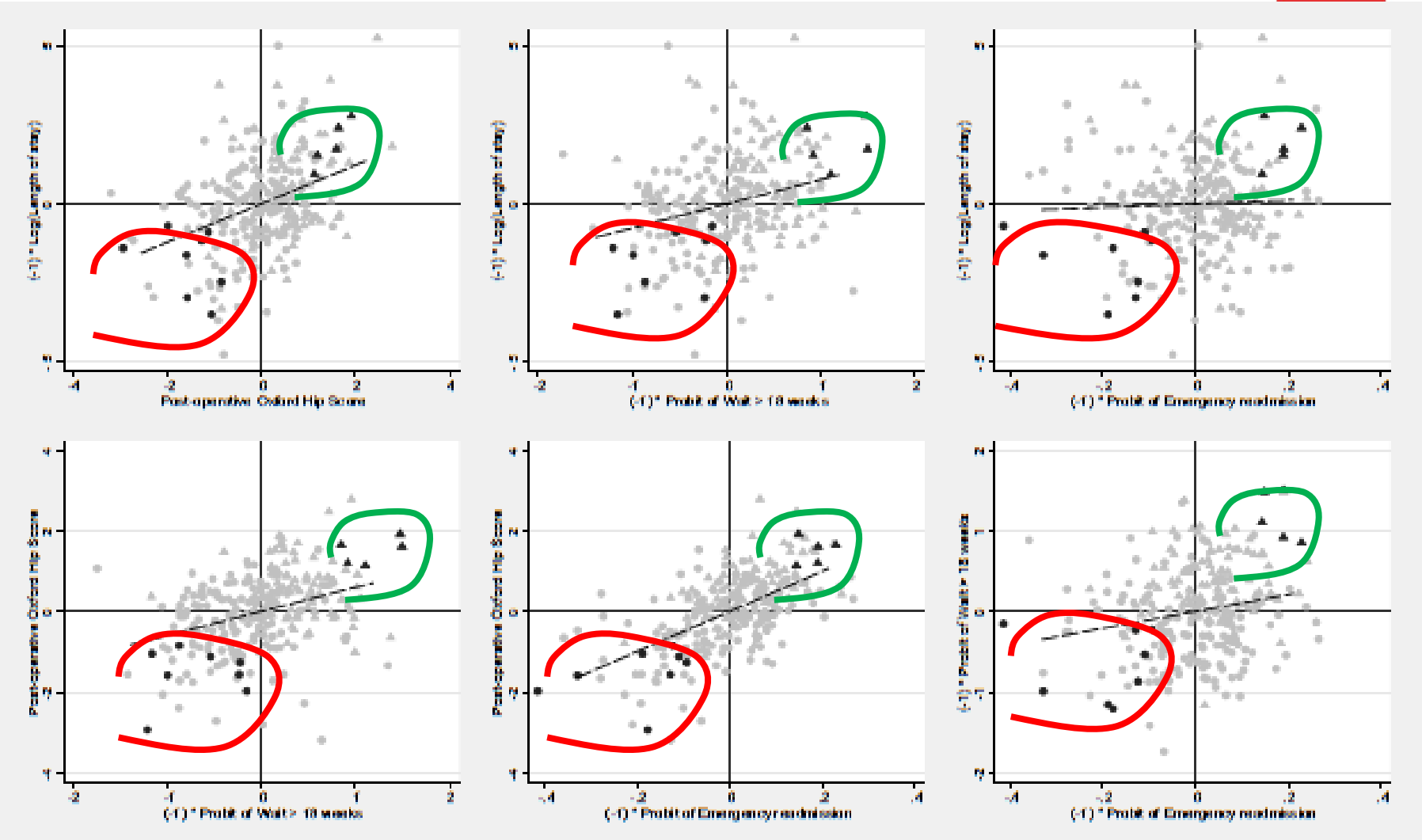
$$\text{R}_{ij} = \alpha_3 + \beta_p X_{pij} + \gamma_{3j} + \varepsilon_{3ij}$$

$$\text{WT}_{ij} = \alpha_4 + \beta_q X_{qij} + \gamma_{4j} + \varepsilon_{4ij}$$

Provider performance



Provider performance



How to measure performance



Performance analysis should:

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Emergency Care Pathways for older people



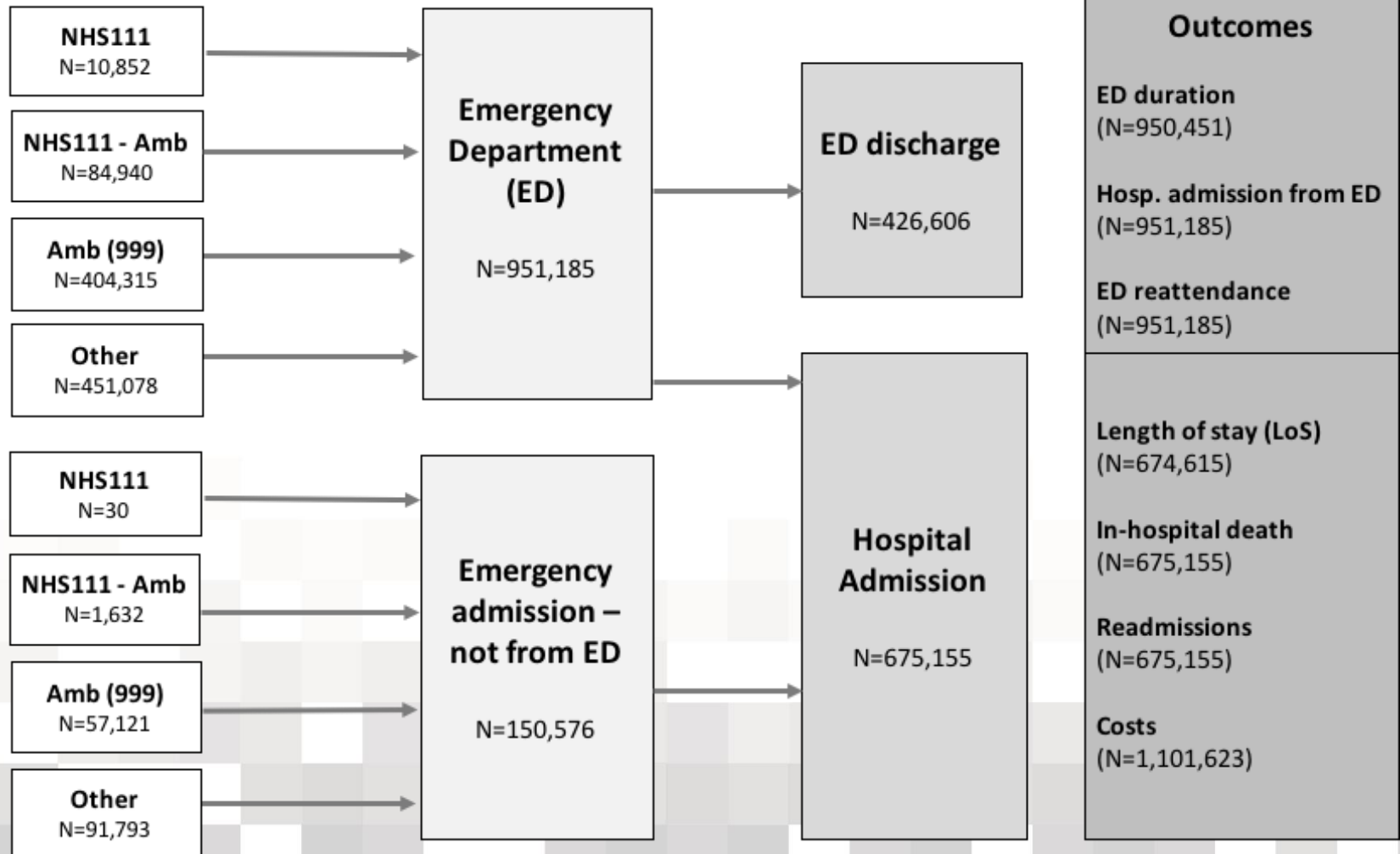
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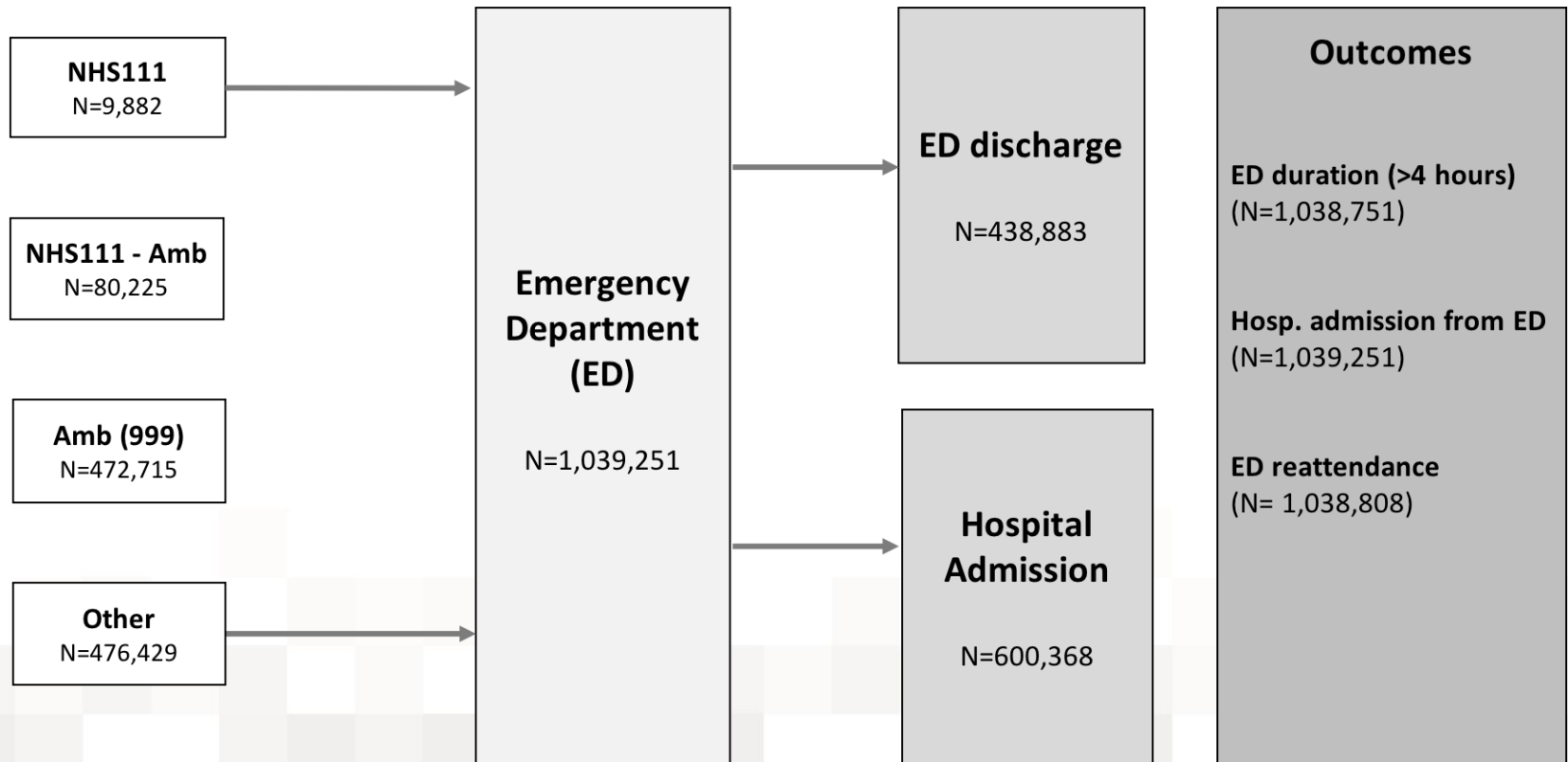
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Emergency Care Pathways for older people



ED Pathway



Why do Outcomes differ among older people?



- Because **people** are different

Patient characteristics

Age, gender, frailty
Care home resident
Distance to hospital
Diagnoses
Attendance and admission history

Pathway characteristics

Length of NHS111 or 999 call
Call-handler urgency
Ambulance time on scene and journey time

- Because **EDs** are different

- **ED characteristics**

Size (attendances / admissions)
Staffing
Performance

- Because **timing** matters

Out of hours
Day of week and bank holidays
Month
Year

Outcome variables



Outcome	%
ED duration (>4 hours)	28%
Hospital admission from ED	58%
ED re-attendance within 30 days	20%

Econometric Model



$$Y_{ij}^* = \beta_0 + \sum_{k=1}^K \beta_k X_{ij} + u_j + \tau_t + \varepsilon_{ij}$$

Outcomes –
ED duration,
Hospital
admission,
ED reattendance

**Patient
characteristics**

**ED level
effect**

**Patient level
residual error**

Time dummies

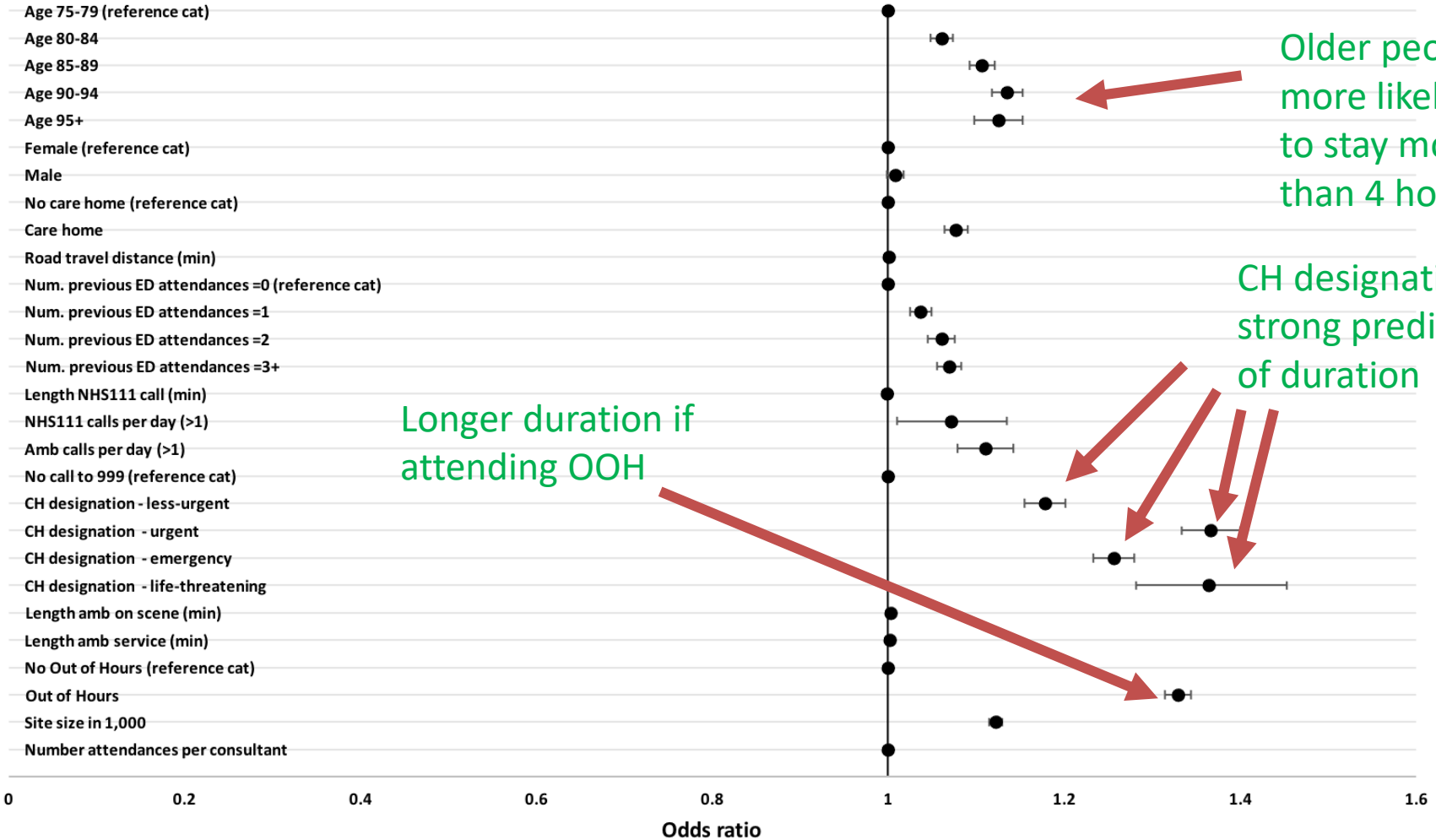
*patient i in site j ;
 k , indicate vector of variables within each subset*

Call-handlers designation



Call-handler designation	%
Less urgent	25
Urgent	9
Emergency	18
Life-threatening	0.5
No call to 999	47

ED duration (>4 hours)



Older people more likely to stay more than 4 hours

CH designation strong predictor of duration

Longer duration if attending OOH

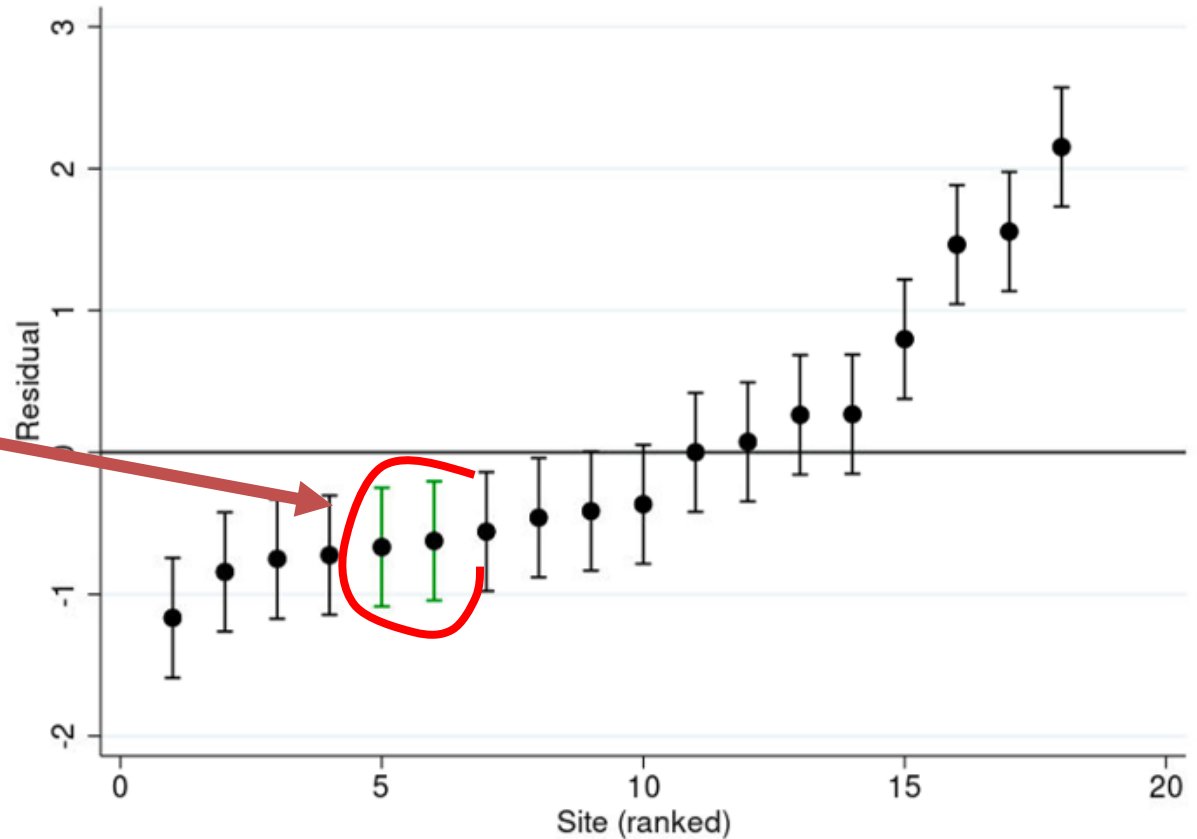
ED duration (>4 hours)



The green EDs are interesting ...

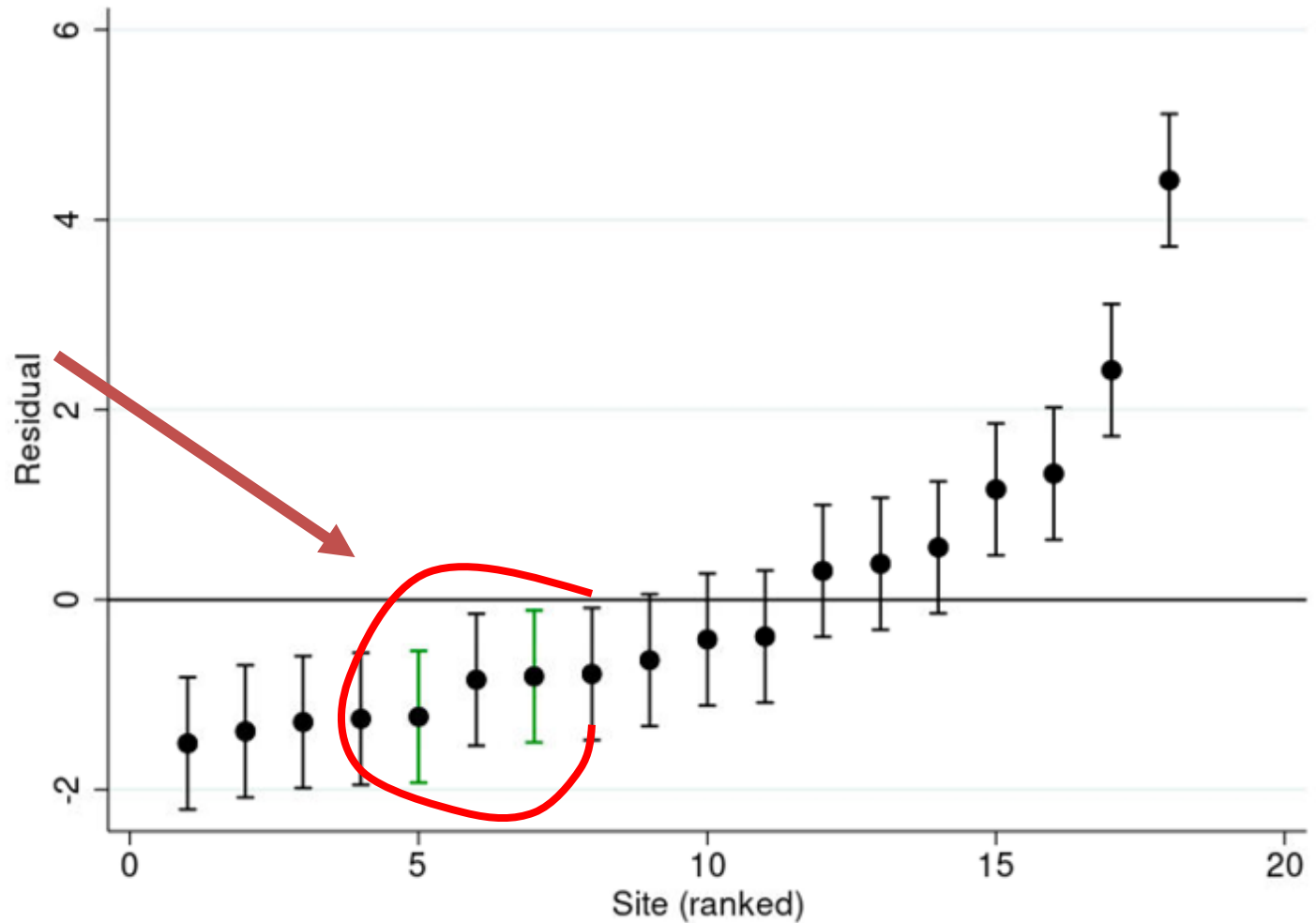
Their patients are less likely to stay >4hrs ...

(and less likely to be admitted to hospital and to re-attend the ED)

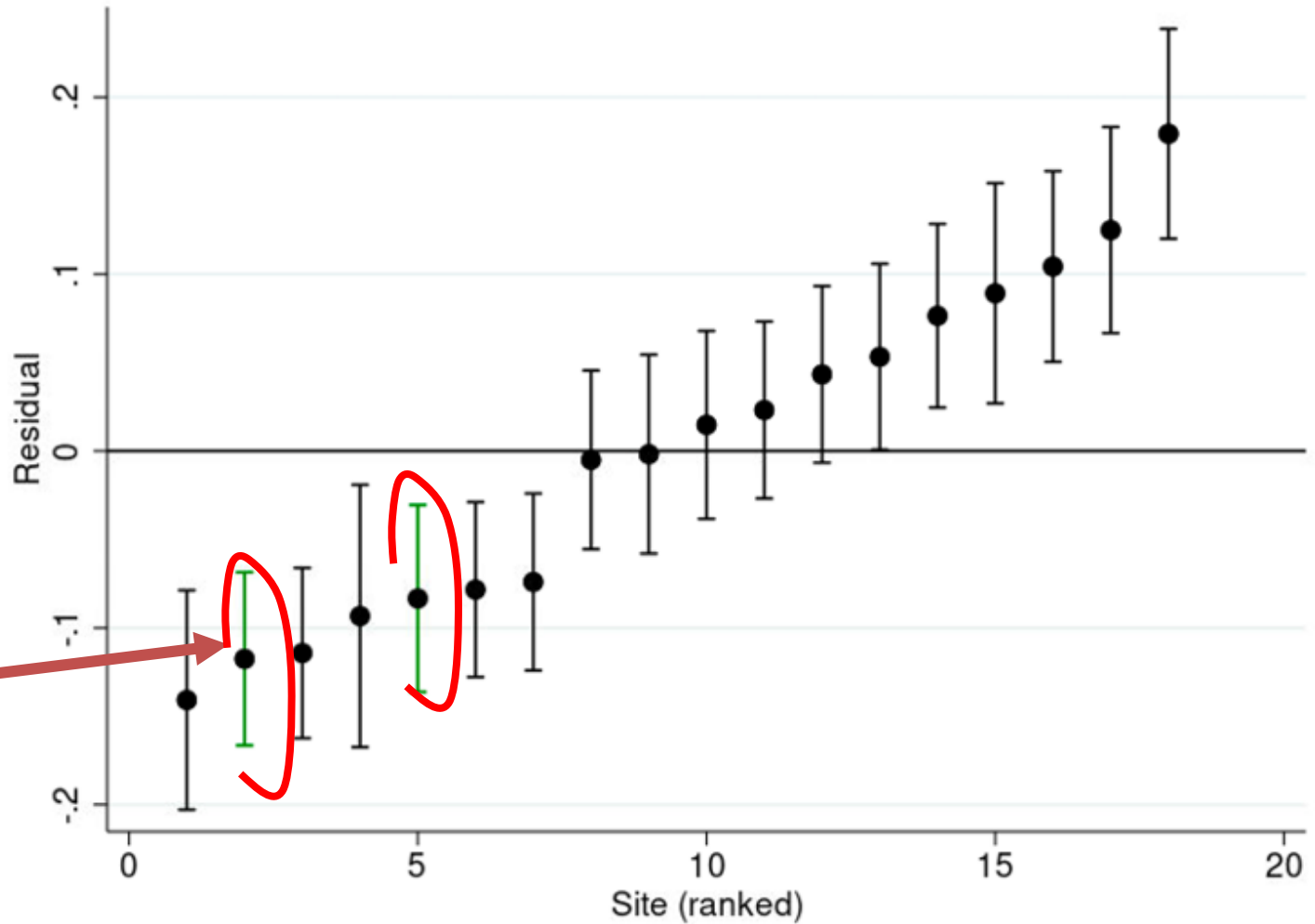


Hospital admission

Patients in those 2 EDs are also less likely to be admitted to hospital ...



ED reattendance (≤ 30 days)



Patients in those 2 EDs are also less likely to re-attend ...

How to **improve** performance



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Pressing challenges



The **multi-morbidity** challenge

How can we support people with **multiple chronic long-term conditions** who require ongoing and **integrated** care from different health and social care providers?

Addressing this challenge



Analytically

- Linking patient data across health and social care **settings** and over **time**

Practically

- Developing payment systems based on **entire care pathway** rather than discrete events and
- that encourage **joint working**

Conclusion



Finland has a long tradition of health care performance measurement, exploiting **high quality data** and undertaking **focused analyses** of specific areas of activity.

Building on this foundation, future challenges are to:

- consider **health outcomes** and **multiple objectives**;
- assess patient pathways and **integrated care** delivery, particularly for people with multi-morbidity;
- ensure that **incentives** promote performance improvement.