Incorporating equity into health care performance measurement: a framework and application

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Disclaimer

- This is unpublished work-in-progress arising from the research project: Cookson, R, Raine, R, Laudicella, M, Goddard, M, Ferguson, B, Fleetcroft, R, Goldblatt, P. Jan 2013 to Dec 2015. Developing indicators of change in NHS equity performance. NIHR Health Services and Delivery Research (HSDR) Programme (project number 11/2004/39).

- Please do not cite any of the findings in this slide pack, as they have not been peer reviewed and are subject to change and revision as the project proceeds.

Outline

- Introduction
- Framework
- Methods
- Results
- Discussion

Introduction

"the isolation of disparities from mainstream quality assurance has impeded progress in addressing them"

Fiscella K, Franks P, Gold MR, Clancy CM. Inequality in quality: addressing socioeconomic, racial, and ethnic disparities in health care. *Journal of the American Medical Association* 2000;283; 2579-2584

"Investigators have failed to learn about equity from existing clinical data"

Barbara Starfield
1932-2011

Starfield B, Gérvas J, Mangin D. Clinical Care and Health Disparities. *Annual Review of Public Health* 2012;33; 89-106

Background

- Global policy concern about equity / inequality / disparity in health and health care
  - e.g. In England, public healthcare payers have a duty to consider reducing health inequalities
- Mainstream health care performance measurement focuses on *general population averages* rather than *social distributions*
  - Indicator breakdowns by social group are sometimes published, but not routinely used to inform mainstream decision making

Existing Indicators of Equity in Health Care

- US National Healthcare Quality and Disparities Reports by the Agency for Healthcare Research and Quality
  http://www.ahrq.gov/research/findings/nhqrdr/

- English NHS Outcomes Framework
  https://www.gov.uk/government/publications/nhs-outcomes-framework-2015-to-2016

- Statistics Canada Health Indicators
  http://www.cihiconferences.ca/indicators/2013/ind2013_e.html

Limitations of Existing Indicators of Health Care Equity

1. No coherent framework for thinking about equity performance

   – Lack of integration between health care and population health perspectives on equity

2. Disproportionate focus on hospital quality

   – Important inequalities arise at pre- and post-hospital stages of the patient pathway

3. No 1-page summary

   – "Indicator chaos"; equity buried in detail

English Experience With Indicators of Inequality in Population Health

- Health inequality targets in the 2000s
  - Incorporated into performance management regime for local health care payers and local government
- Subsequent health inequality indicator sets
  - English Marmot Indicators (local government indicators of socioeconomic inequality in disability-free life expectancy)
    - http://www.lho.org.uk/LHO_Topics/National_Lead_Areas/Marmot/MarmotIndicators2014.aspx
  - English Local Basket of Inequality Indicators
    - https://indicators.ic.nhs.uk/webview/index.jsp?catalog=http%3A%2F%2Fhg-l-app-472.ic.green.net%3A80%2Fobj%2FfCatalog%2FCatalog50&submode=catalog&mode=documentation&top=yes
- No evidence of impact on *health care* decisions

"Why local trends were going in the direction that they were was essentially a 'black box' issue...Very few interviewees pointed to evidence that their local programmes to tackle health inequalities were having a measurable effect."

Blackman T, Elliott E, Greene A, Harrington B, Hunter D, Marks L, McKEE L, Smith K, Williams G. TACKLING HEALTH INEQUALITIES IN POST-DEVOLUTION BRITAIN: DO TARGETS MATTER? *Public Administration* 2009;87; 762-778.

Aims

1. To develop a framework for incorporating equity into health care performance measurement

2. To apply this framework to the English NHS from 2001 to 2011
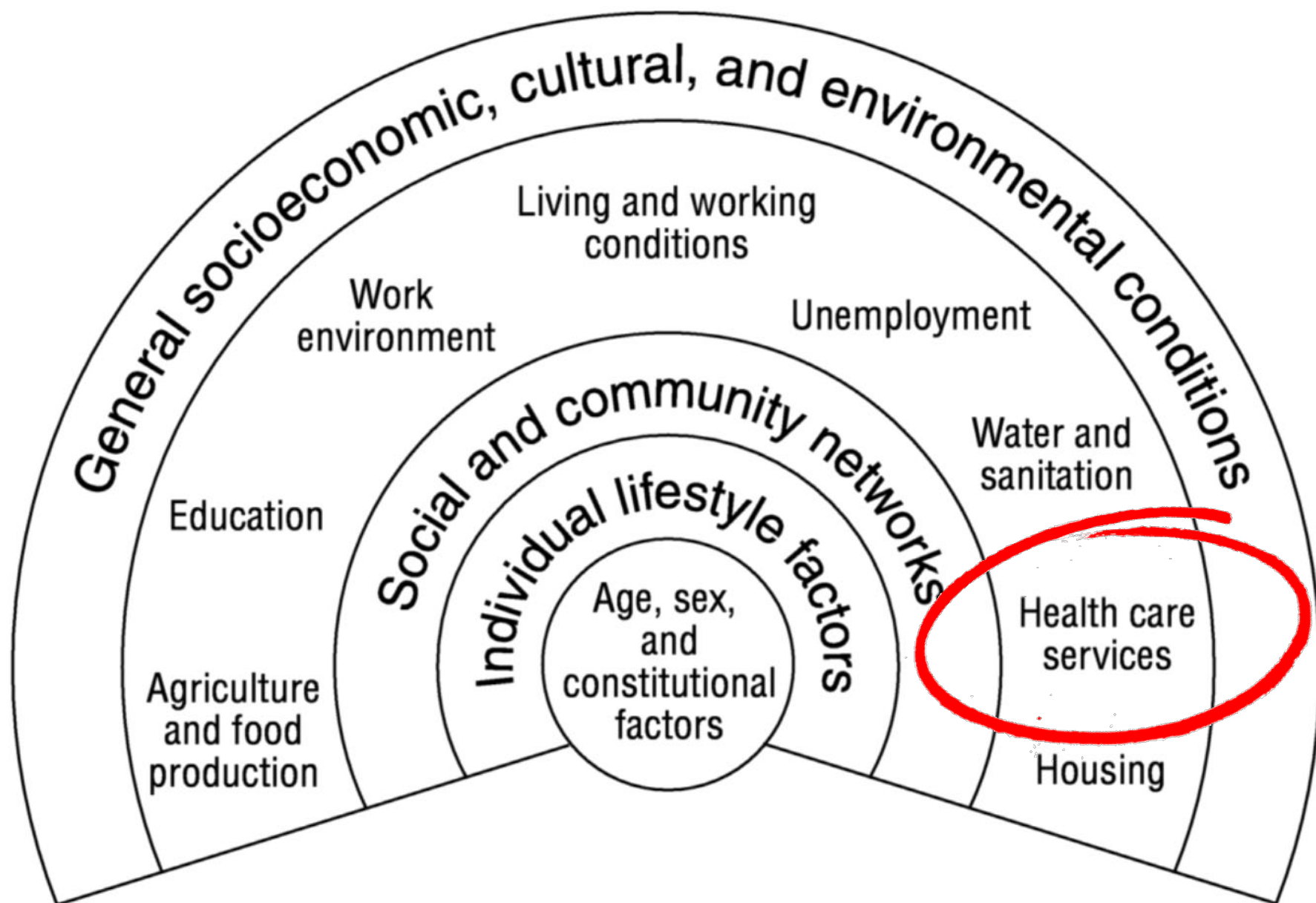
Products

1. **Equity Dashboards:** 1-page summary
2. **Equity Chartpacks:** in-depth information in a standard format
3. **Equity Google Graphs:** create your own graphs

- At both national and sub-national levels

- Comprehensive suite of equity visualisation tools to help decision makers and members of the public understand complex inequality patterns

Framework

Ultimate objectives: improve population health and reduce social inequality in health

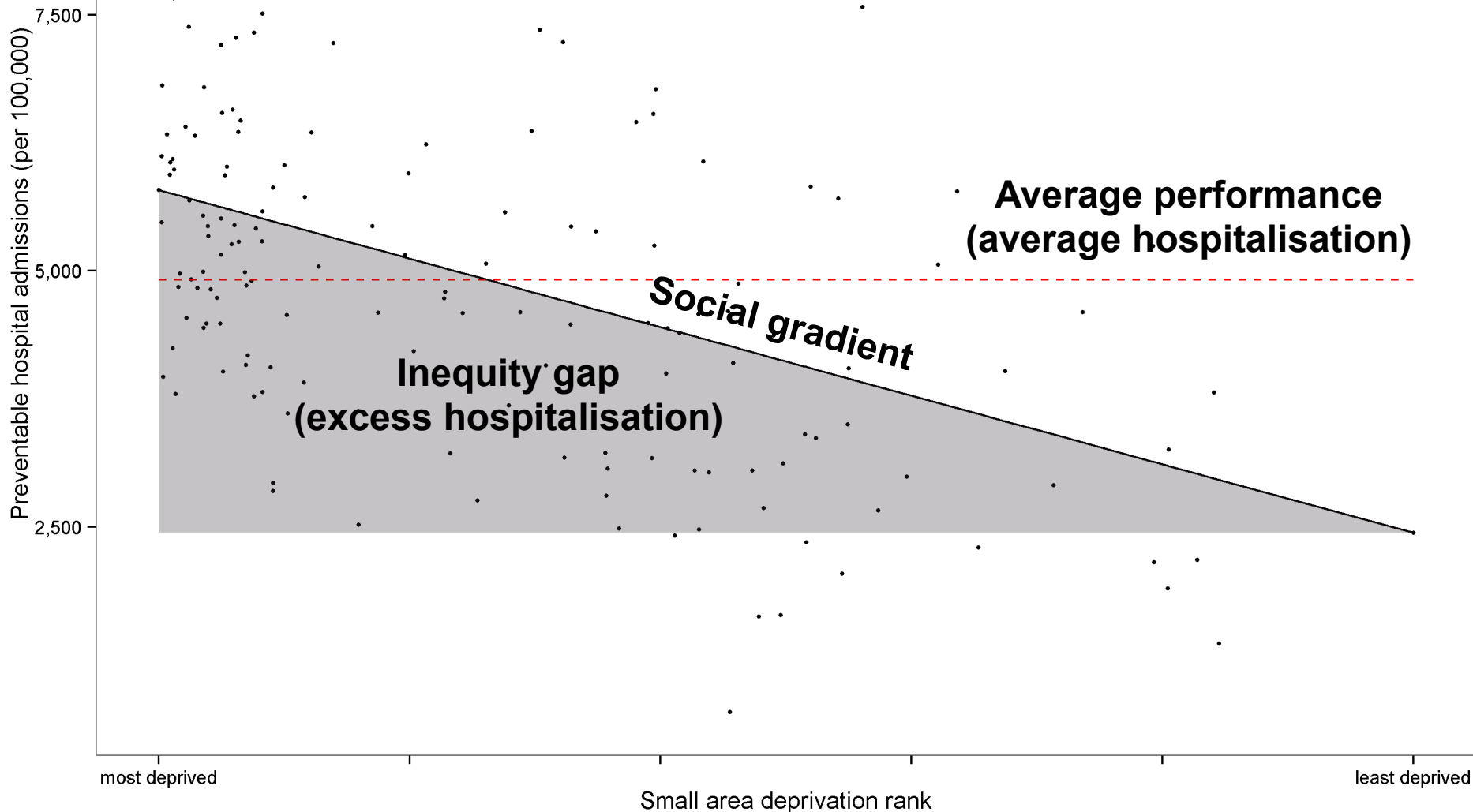Quality adjusted life expectancy at birth, England and Wales
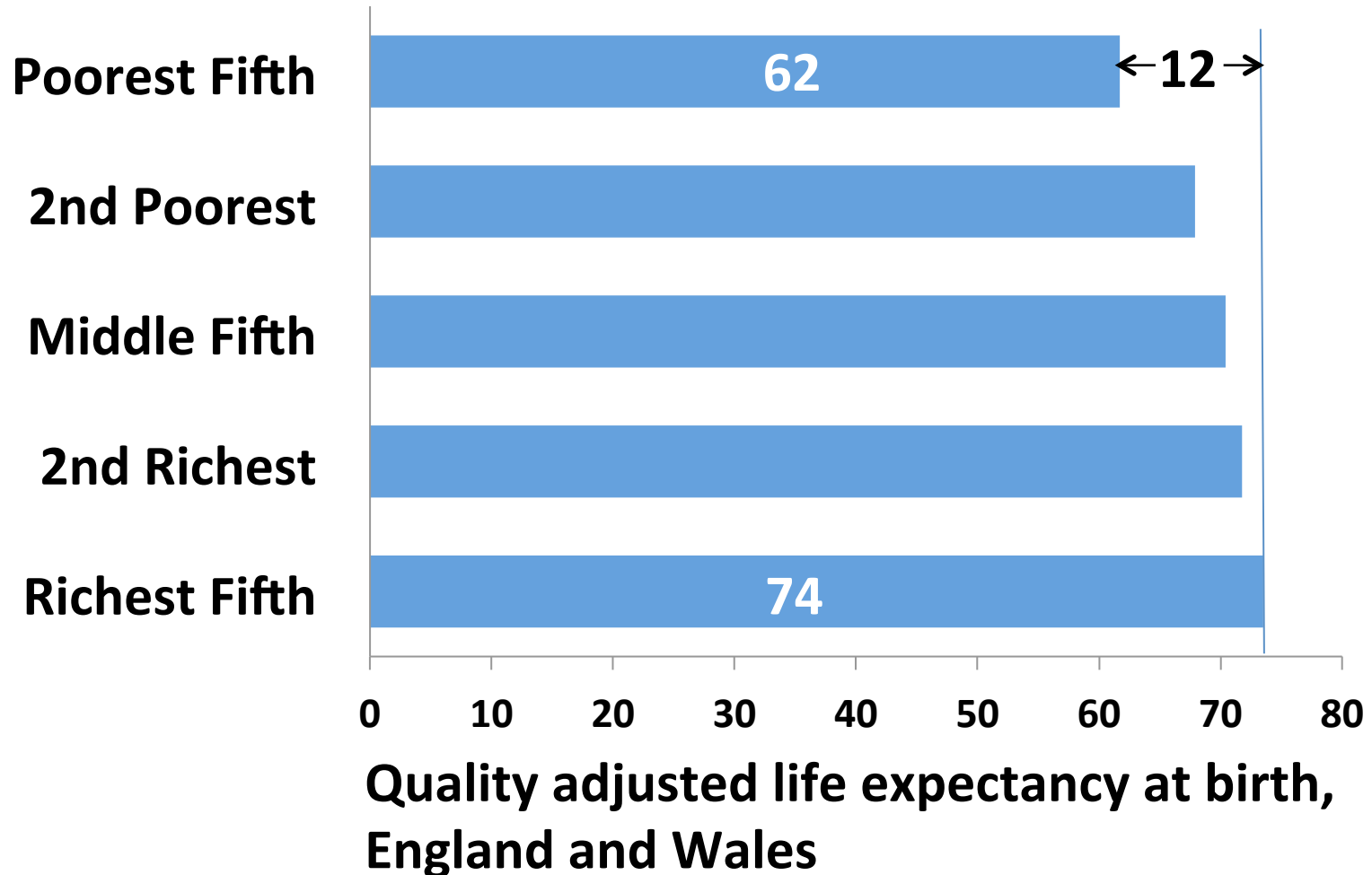
Source: Love-Koh J, Asaria M, Cookson R, Griffin S. (2015). The Social Distribution of Health: Estimating Quality-Adjusted Life Expectancy in England. *Value in Health* http://dx.doi.org/10.1016/j.jval.2015.03.1784

General socioeconomic, cultural, and environmental conditions

Living and working conditions

Work environment

Unemployment

Social and community networks

Individual lifestyle factors

Education

Water and sanitation

Age, sex, and constitutional factors

Health care services

Agriculture and food production

Housing

Intermediate objectives: improve health care and reduce social inequality in health care at all stages of the patient pathway

A. Home

B. Primary and Community Care

C. Hospital

D. Die
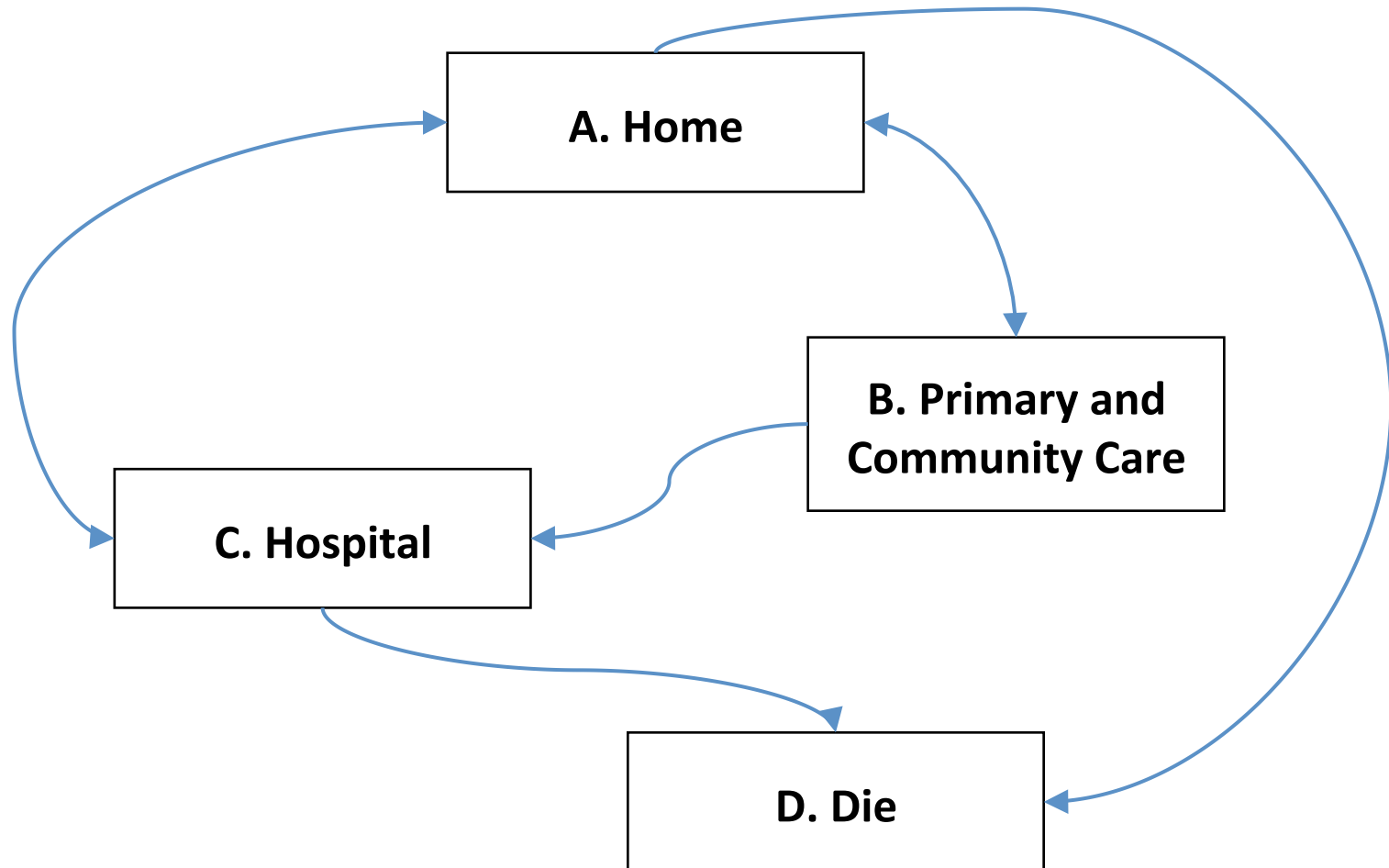
Preventable hospitalization per 100,000 population (adjusted for age and sex) by English neighbourhood deprivation

- Y-axis: Preventable hospital admissions (per 100,000) — 2,500; 5,000; 7,500
- X-axis: Small area deprivation rank — most deprived ... least deprived

Average performance (average hospitalisation)

Social gradient

Inequity gap (excess hospitalisation)

Key Design Objectives

1. Integrate "ultimate" population health objectives with "intermediate" health care objectives

2. Integrate all stages of the patient pathway

3. Integrate average and equity performance

4. Detailed local monitoring of sub-national administrative areas on a comparable basis

5. 1-page summary "dashboard"

Further Design Objectives

5. Monitor levels, short-term and long-term trends

6. Monitor all stages of the life course

7. Explicit about uncertainty and value judgements

8. Explicit adjustment for population risk and need

9. Meaningful to the general public

10. Intuitive, visualisable and general measures

Performance Measurement Framework for the Canadian Health System Proposed in 2013 by the Canadian Institute for Health Information
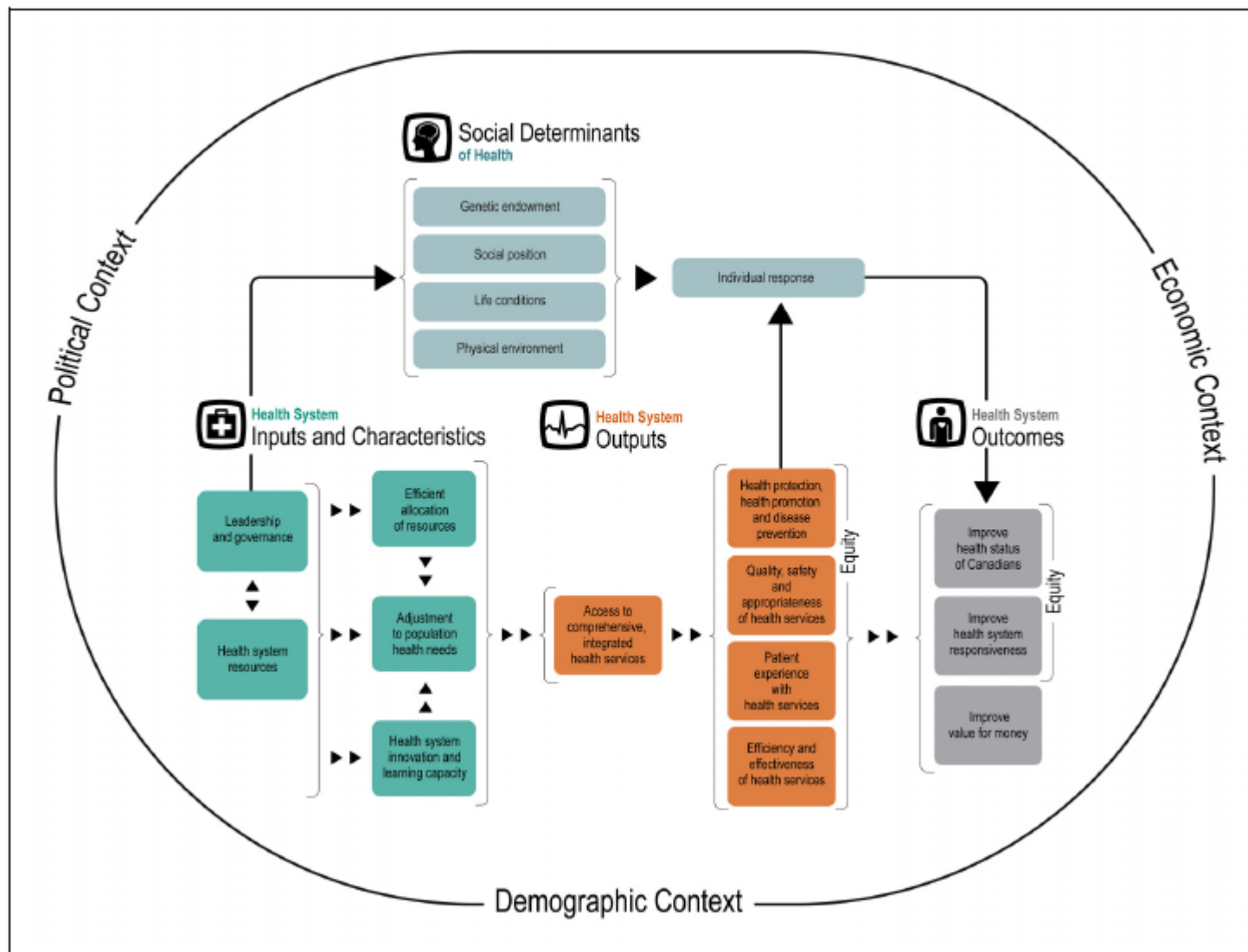
Methods

Indicators of health care access and outcomes at all stages of the patient pathway

A. Home

1. **Primary care Supply**
2. **Primary Care Quality**

4. **Preventable hospitalisation**

5. **Repeat hospitalisation**

3. **Hospital waiting time**

B. Primary and Community Care

C. Hospital

6. **Post-hospital mortality**

7. **Amenable Mortality**

D. Die
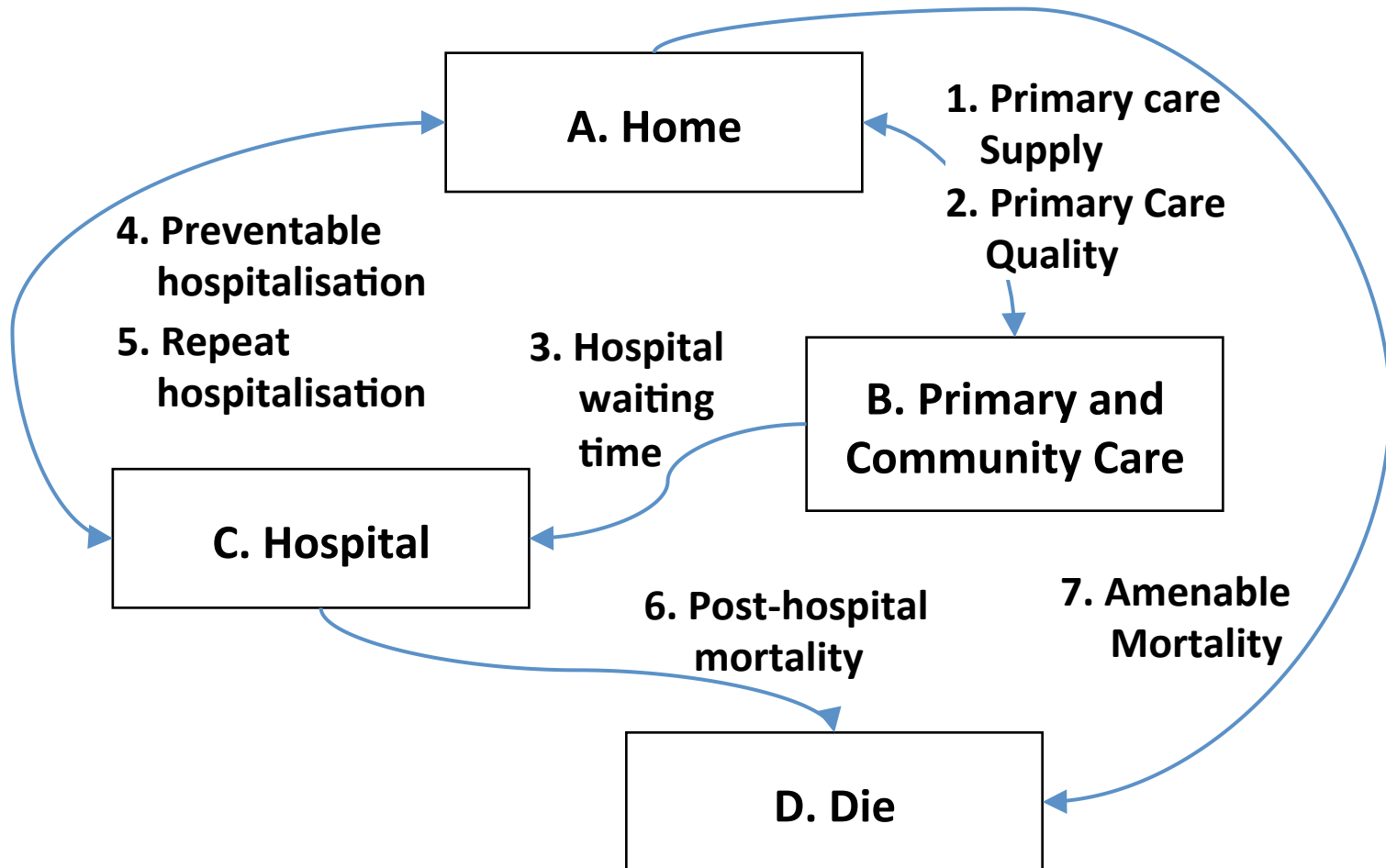
Indicator Definitions

1. Primary care supply: full time equivalent primary care physicians per 100,000 population[a,b]
2. Primary care quality: average clinical process quality, weighted by expected mortality benefit (based on UK primary care pay-for-performance data)
3. Hospital waiting time: days from outpatient decision-to-treat to inpatient admission-for-treatment[c]
4. Preventable hospitalisation: proportion of people with an emergency admission for an ambulatory care sensitive condition[a]
5. Excess hospital stays: proportion of inpatients with excess length of stay
6. Post-hospital mortality: proportion of people dying within 12 months after discharge[a,c,d]
7. Amenable mortality: proportion of people dying from causes amenable to health care[a]
8. Mortality: proportion of people dying from any cause[a]
9. Morbidity: proportion of people with one or more chronic condition (based on UK primary care pay-for-performance data)[a]

[a] Adjusted for age and sex   [b] Adjusted for neighbourhood ill-health
[c] Adjusted for patient casemix   [d] Adjusted for patient comorbidity

Unit of Analysis

- English small areas – 32,482 lower layer super output areas (LSOAs) from the 2001 census
  - Neighbourhoods of about 1,500 people (range 1,000 to 3,000)
- Clustered within sub-national administrative areas that act as local health care payers
  - 211 "Clinical Commissioning Groups"

Datasets

(1) data on primary care supply from general medical statistics (Indicator 1),

(2)data on primary care quality and disease prevalence from the UK primary care pay-for-performance programme (Indicators 2 and 9),

(3)data on hospital activity from hospital episode statistics (Indicators 3, 4, 5, 6)

(4)mortality data (indicators 7, 8)

Data Linkage

- Indicators 1, 2 and 9 require attribution from primary care practice level to small area level, based on **data on the small area of residence of all registered patients**.

- Indicator 6 requires **patient level linkage between hospital and mortality data**.

Socioeconomic Measure

- **Index of Multiple Deprivation 2010** rank for English small areas
  - Combines data on low income benefit claims with other neighbourhood deprivation indicators.
  - Highly correlated with other deprivation indicators
  - Removing the "health deprivation" component makes little difference in practice.
  - Time-fixed, so trends reflect change in outcomes not change in the deprivation measure or group

Equity Performance

- **Relative Inequality Index (RII):**

  % gap between the most and least deprived neighbourhoods in England as a % of the average.

- **Slope Index of Inequality (SII):**

  The absolute gap between the most and least deprived neighbourhoods in England.

  – A positive index is always "pro-rich"

  – Advantages: summarise the full social gradient; easy to interpret; capture both absolute and relative inequality

  – Based on linear regression using all small areas, with deprivation rank on a fractional 0 to 1 scale.

Trends

- Two year trend
  - Last two years minus the two years before that
  - Avoids 1 year "blips" in the data
- An **overall inequality trend** requires a positive and significant inequality trend in the same direction for both SII and RII.

Results

National NHS Equity Dashboard 2011/12

Indicators of Health Care Access and Outcome	England Average	England Trend	Relative Inequality Index (RII)		Overall Inequality Trend	Inequity Gap
			Current	Trend		
1. GP supply per 100,000	58.8		-2.2%	-5.7%	↓	no gap
2. Primary care quality (%)	77.5%		1.9%	-0.5%	↓	1.5 points
3. Hospital waiting time						
4. Preventable hospitalisation (%)	3.6%		76.8%	5.9%	↑	115,121 people admitted
5. Excess hospital stays (%)	16.0%		8.6%	-10.6%	=	57,204 hospital stays
6. Post-hospital mortality (%)	4.40%		30.4%	3.8%	↑	55,425 deaths
7. Amenable mortality (%)	0.25%		58.1%	0.3%	=	38,879 deaths
8. Mortality (%)	0.87%		60.3%	-0.8%	=	138,555 deaths
9. Morbidity (%)	3.84%		65.1%	1.7%	↑	658,062 cases

Figures adjusted as appropriate for age, sex, casemix and co-morbidity.
See indicator notes for definitions.

Key
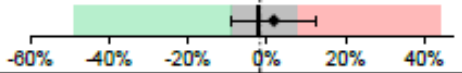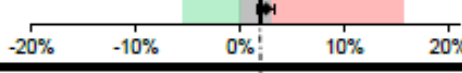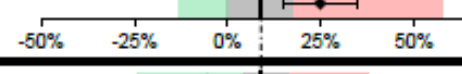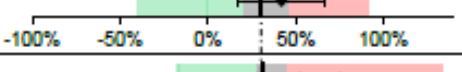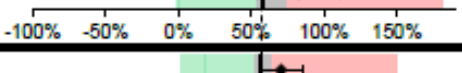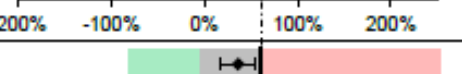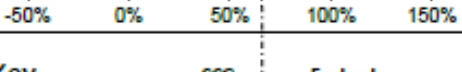
|	
Clearly "pro-rich"	↑ Inequality increasing
Not significant	= Not clear
	↓ Inequality reducing

NHS Equity Dashboard 2011/12: Hull CCG

Hull ▼

Indicators of Health Care Access and Outcome	England Average	CCG Average	Relative Inequality Index (RII) (Spine Plots)	Overall Inequality Trend	Deprived Population: 135,752 (51.3% of the CCG) Inequity Gap
1. GP supply (per 100,000 population)	58.8	52.8		=	7.9 GPs
2. Primary care quality (%)	77.5%	76.3%		=	1.6 points
3. Hospital waiting time (days)					days
4. Preventable hospitalisation (%)	3.6%	4.9%		=	478 people admitted
5. Excess hospital stays (%)	16.0%	12.8%		=	84 hospital stays
6. Post-hospital mortality (%)	4.40%	4.80%		=	178 deaths
7. Amenable mortality (%)	0.25%	0.28%		=	85 deaths
8. Mortality (%)	0.87%	0.94%		=	274 deaths
9. Morbidity (%)	3.84%	5.14%		=	1794 cases

Overall CCG Equity Rank
197
(1st is the most equitable)

Key

CCG (95% CI) England
Best Worst
25th percentile 75th
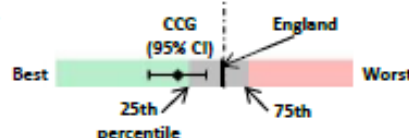
↑ Increasing — Clearly pro-rich
= Not clear — Not significant
↓ Reducing

National Inequality in England 2004/5 to 2011/12

Indicator 1. GP supply
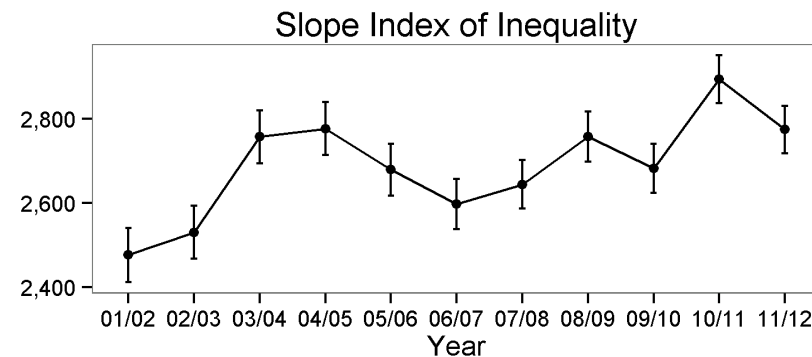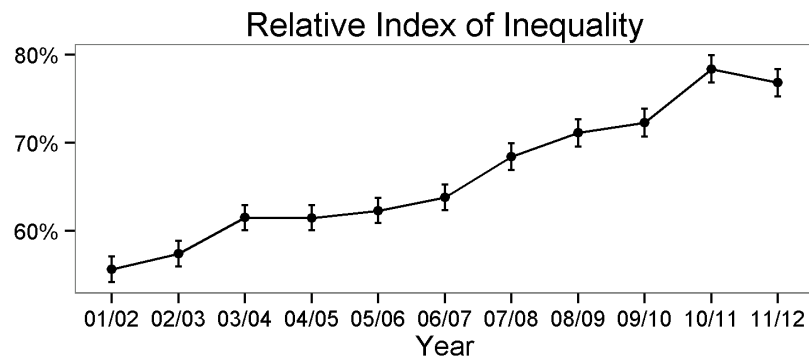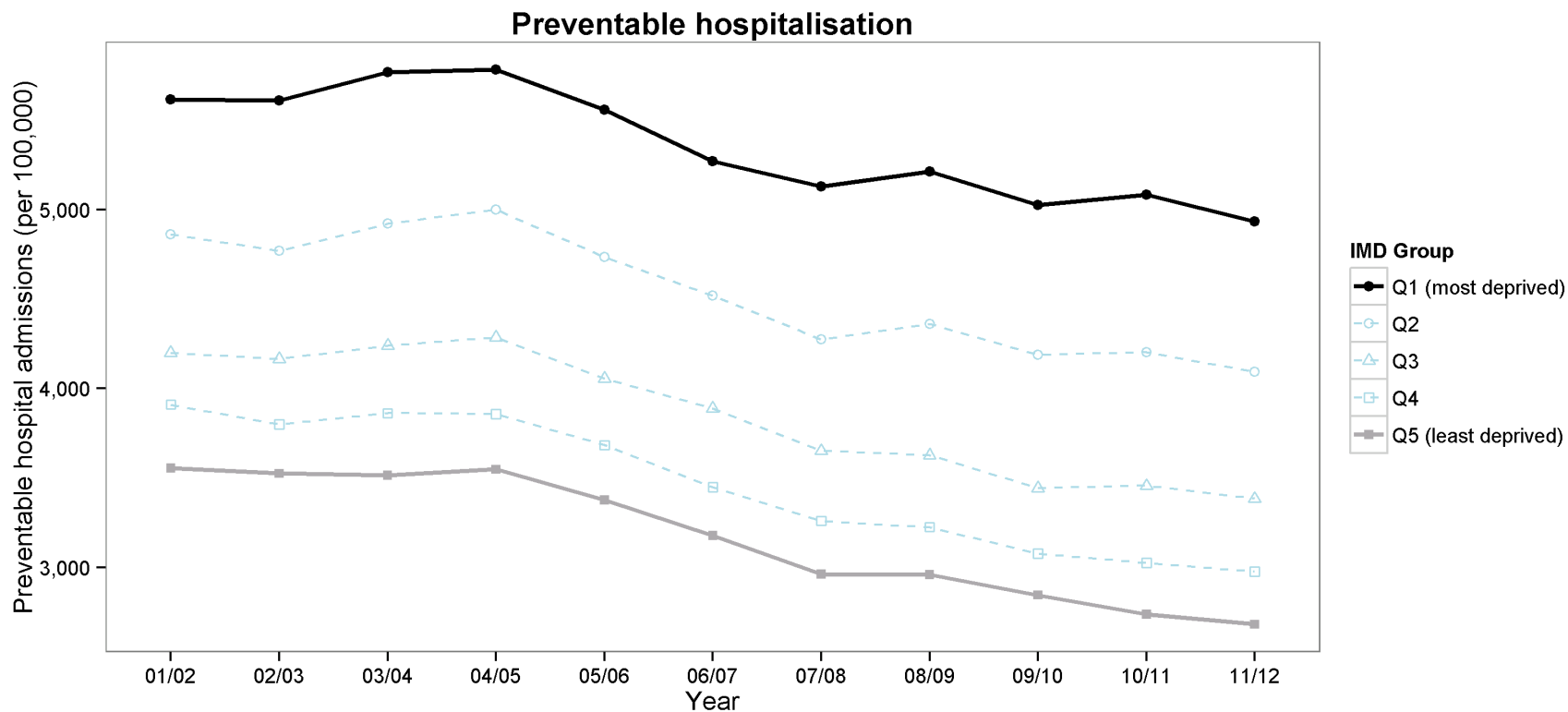

Indicator 1. GP supply: Full time equivalent GPs per 100,000, excluding registrars and retainers, adjusted for age, sex and health deprivation
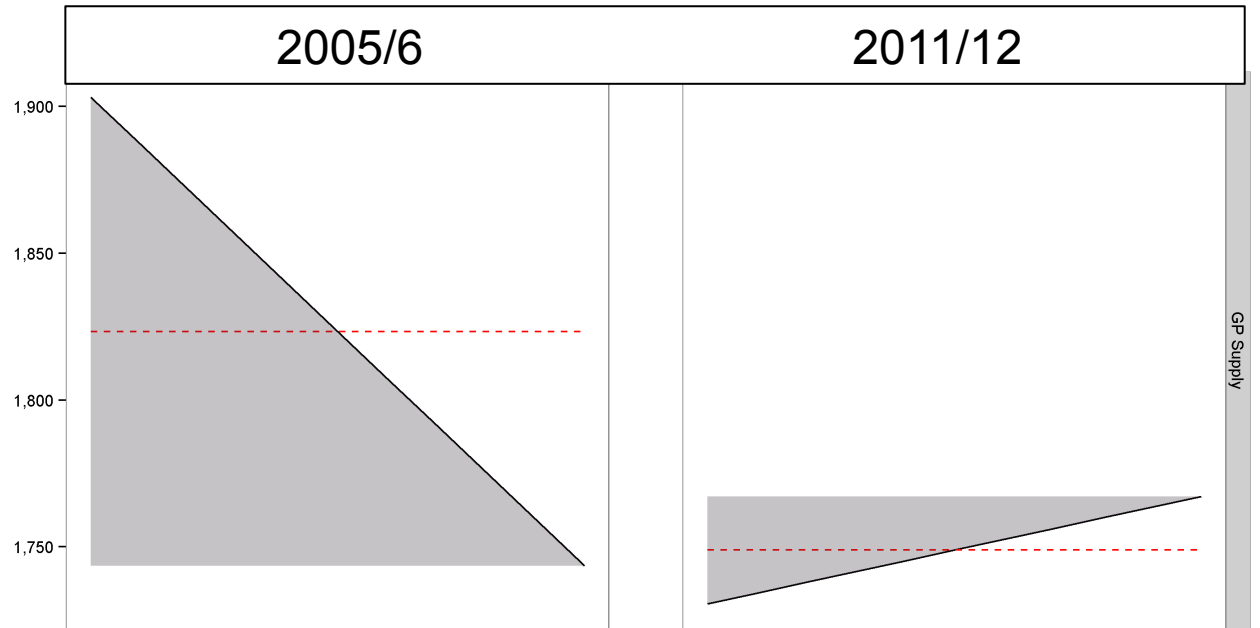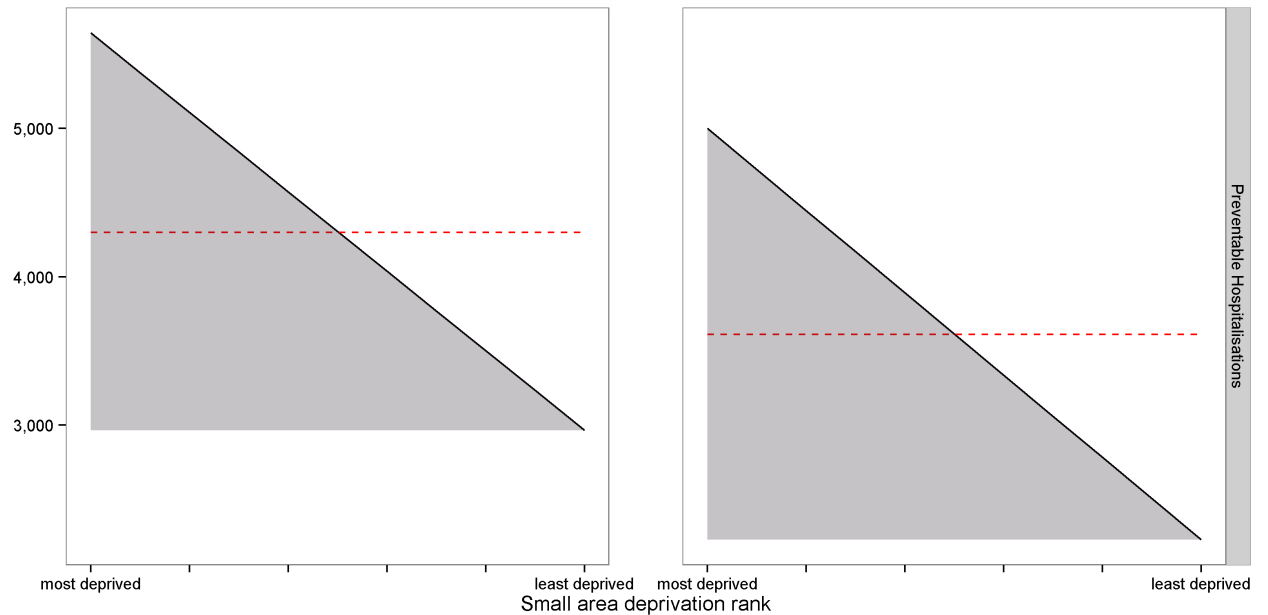
National Inequality in England 2004/5 to 2011/12

Preventable hospitalisation

IMD Group
- Q1 (most deprived)
- Q2
- Q3
- Q4
- Q5 (least deprived)

y-axis: Preventable hospital admissions (per 100,000)

x-axis: Year

Relative Index of Inequality

Slope Index of Inequality

Preventable hospitalisations per 100,000 population for conditions amenable to healthcare
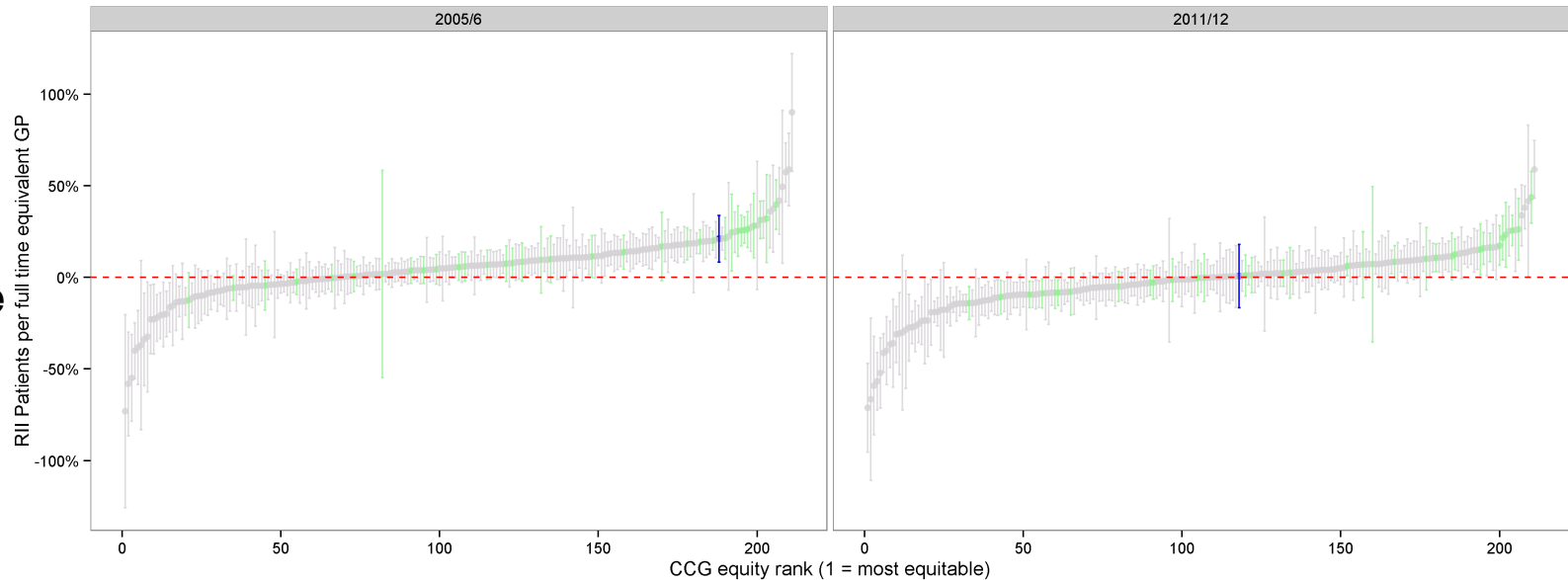
Average and Equity Performance in England

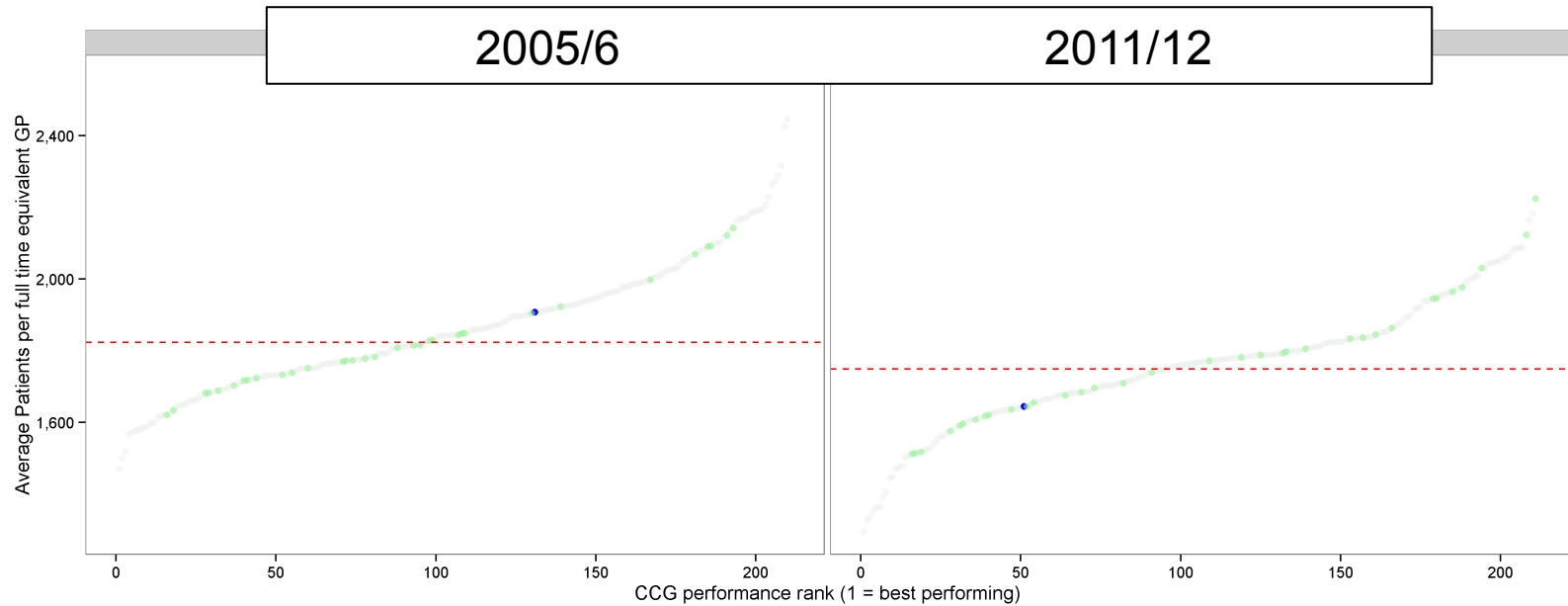|	2005/6	2011/12

Patients per primary care physician

GP Supply

Preventable hospitalization

Preventable Hospitalisations

most deprived — least deprived most deprived — least deprived
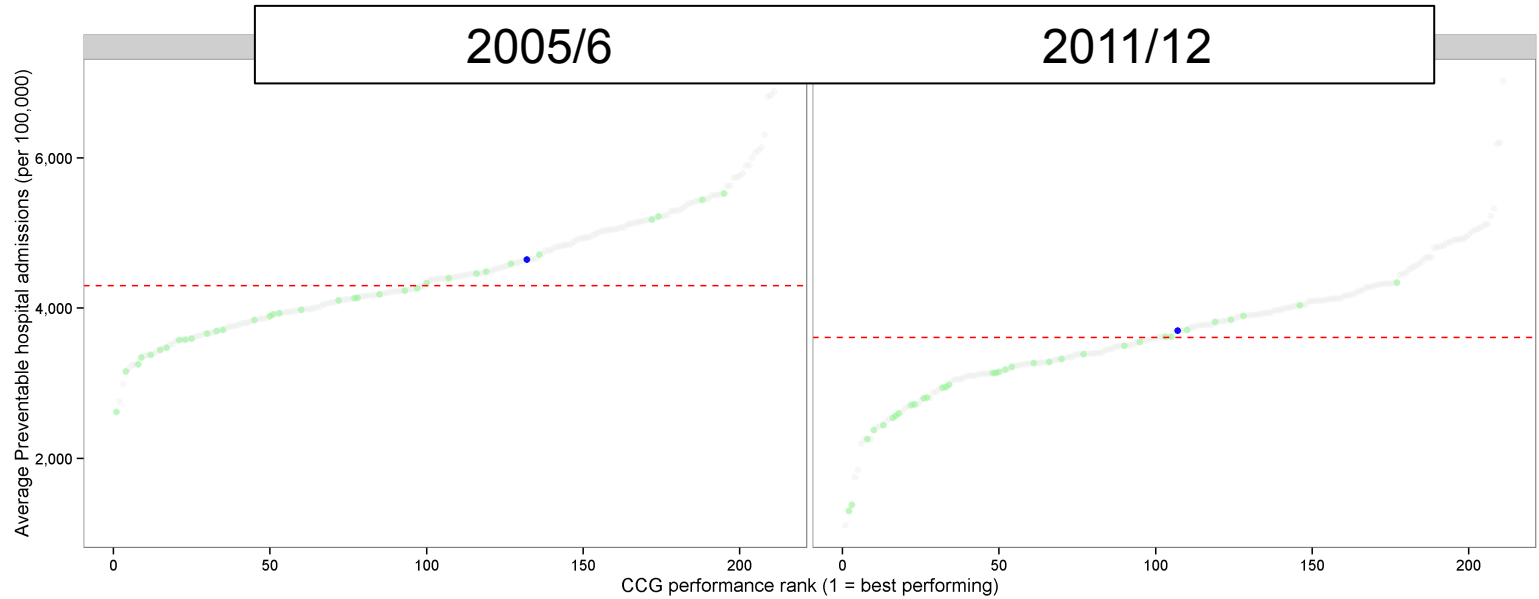
Small area deprivation rank

Sub-National Performance: Patients Per GP
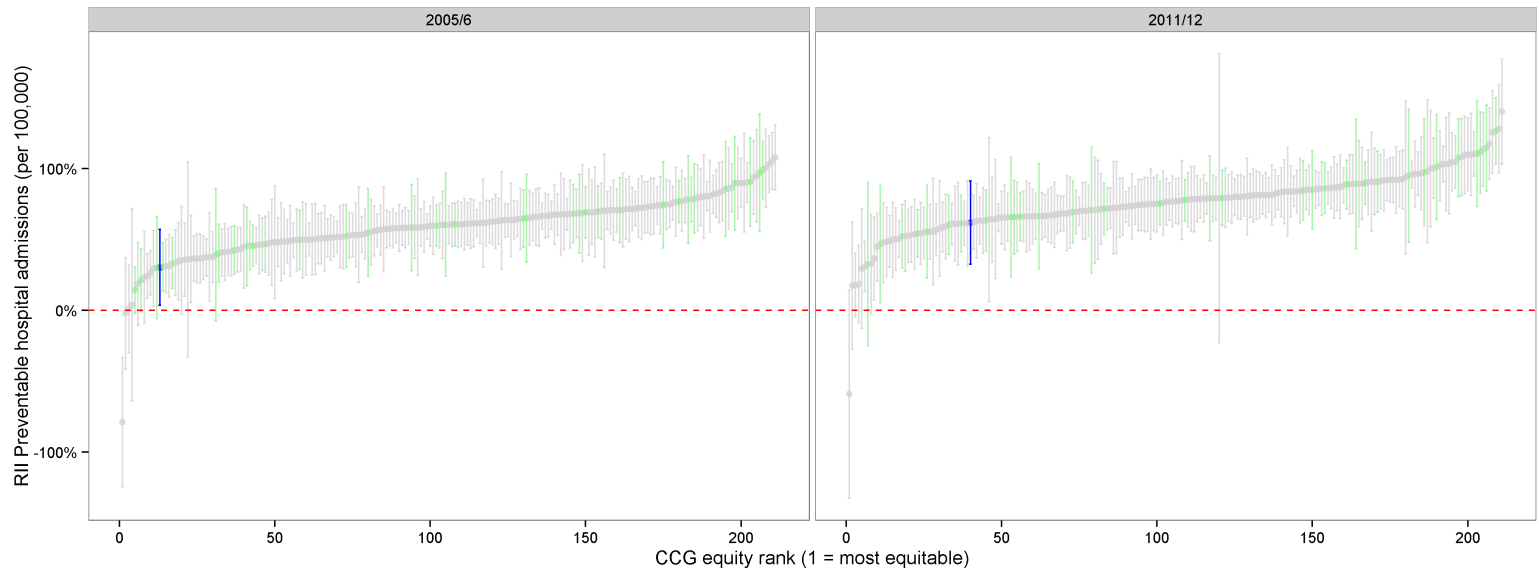# (NHS Ashford – one of 211 "Clinical Commissioning Groups")

Patients per full time equivalent GP, excluding registrars and retainers, adjusted for age, sex and health deprivation

Sub-National Performance: Preventable Hospitalization
(NHS Ashford – one of 211 "Clinical Commissioning Groups")
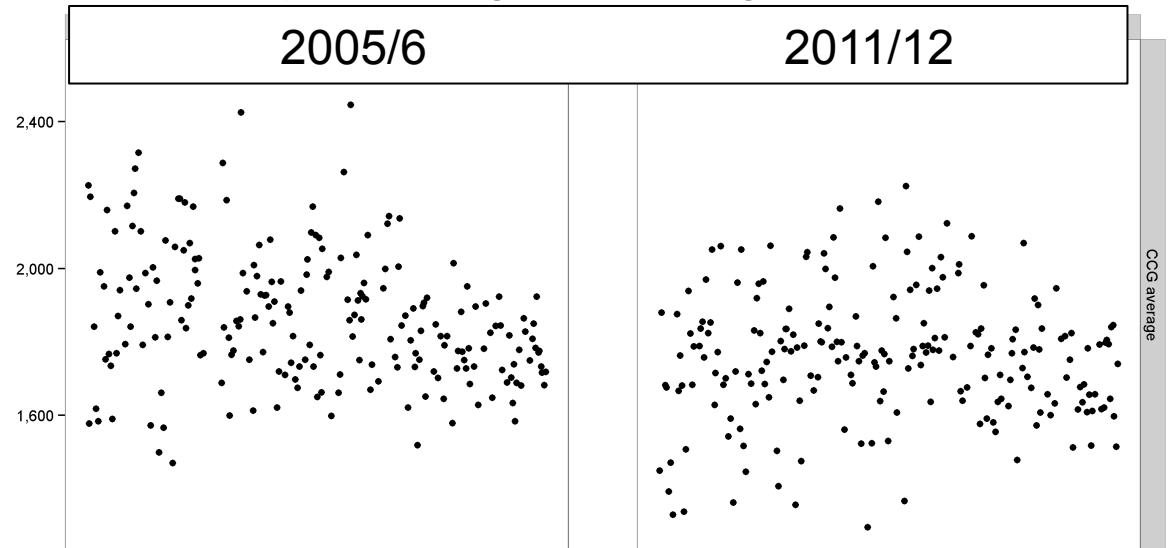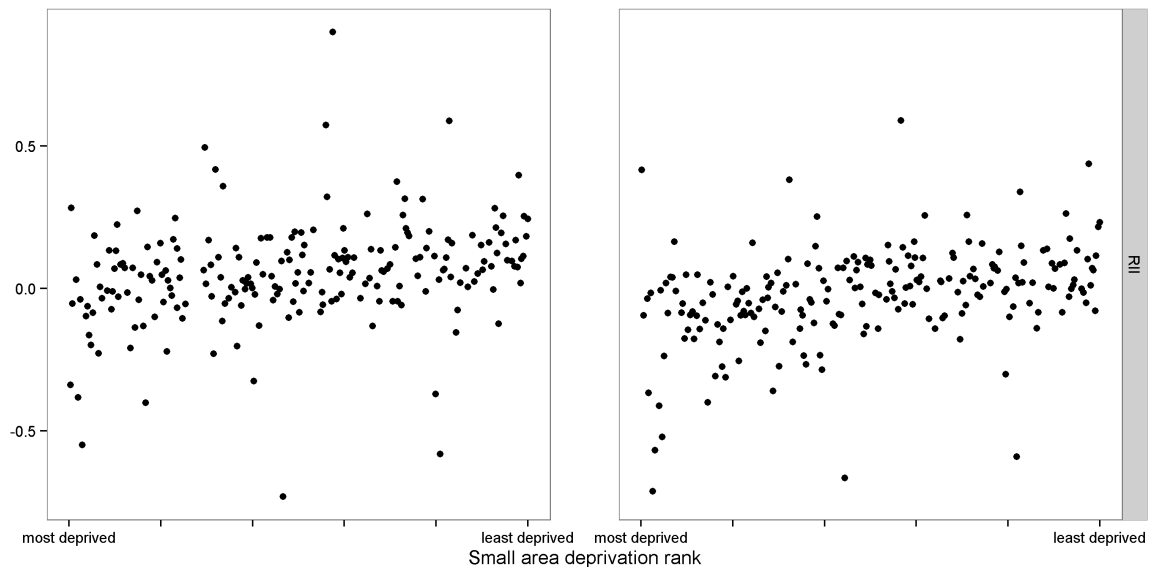

Preventable hospitalisations per 100,000 population for conditions amenable to healthcare

Association between equity performance and deprivation at sub-national (CCG) level: patients per GP
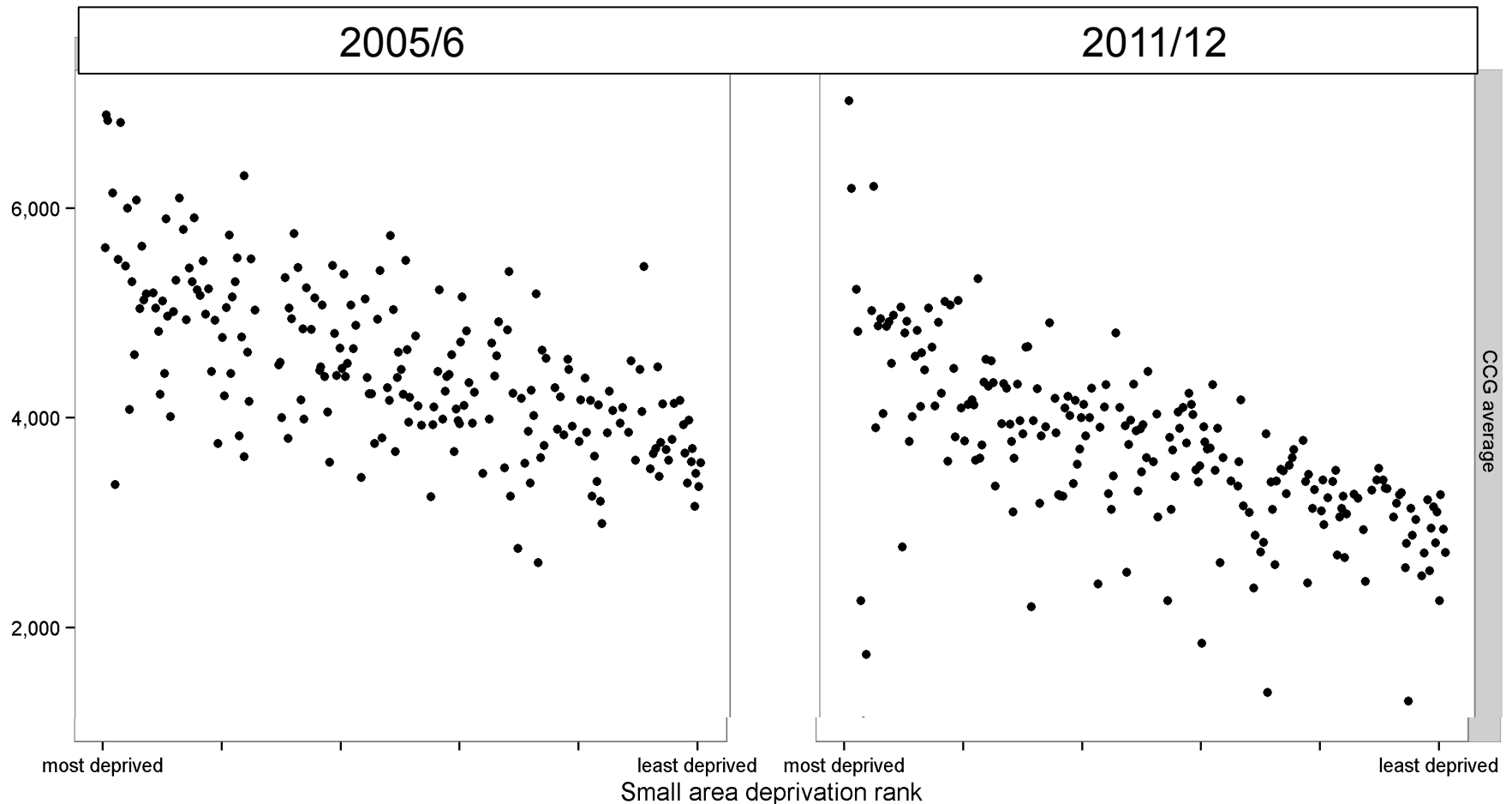

Patients per full time equivalent GP, excluding registrars and retainers, adjusted for age, sex and health deprivation

Association between average performance and deprivation at sub-national (CCG) level: preventable hospitalization

2005/6 | 2011/12

CCG average

6,000

4,000

2,000

most deprived — least deprived   most deprived — least deprived
Small area deprivation rank

Association between equity performance and deprivation at sub-national (CCG) level: preventable hospitalization
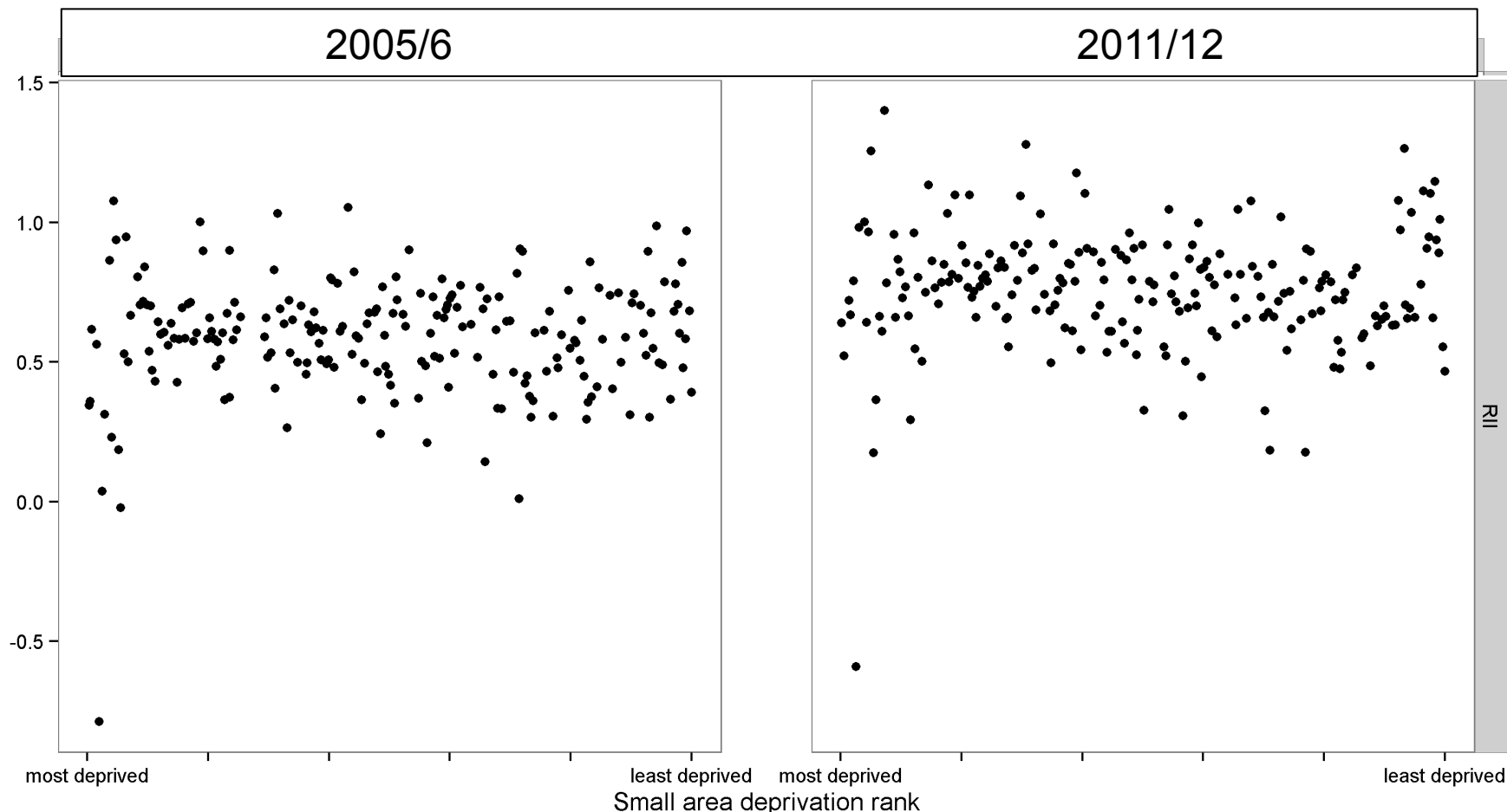
Preventable hospitalisations per 100,000 population for conditions amenable to healthcare

Discussion

- Allows integrated monitoring of both average and equity performance
- Allows detailed local equity monitoring of sub-national units on a comparable basis
  - Though limited statistical power to detect change for units below around 100,000 population
- Could also be used to set performance targets
  - Average performance against trajectory
  - Equity performance against trajectory

Thank you.

"Historically, health inequalities work was generally perceived as the business of public health staff and assessments of unmet need had largely failed to influence mainstream commissioning action. The momentum of large contracts with provider trusts left little room for commissioning to specify inequality objectives in contracts or to shift spend towards prevention and earlier intervention."

Turner D, Salway S, Mir G, Ellison G, Skinner J, Carter L, Bostan B. Prospects for progress on health inequalities in England in the post-primary care trust era: professional views on challenges, risks and opportunities. *BMC Public Health* 2013;13; 274.