



# Exploration of the relationship between multimorbidity and use of primary care resources in the UK

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# Background

- Increasing number of individuals living with multimorbidity
- Long-term chronic illness managed predominantly in primary care setting
- May be useful in budget setting
- Previous work: USA/Secondary care

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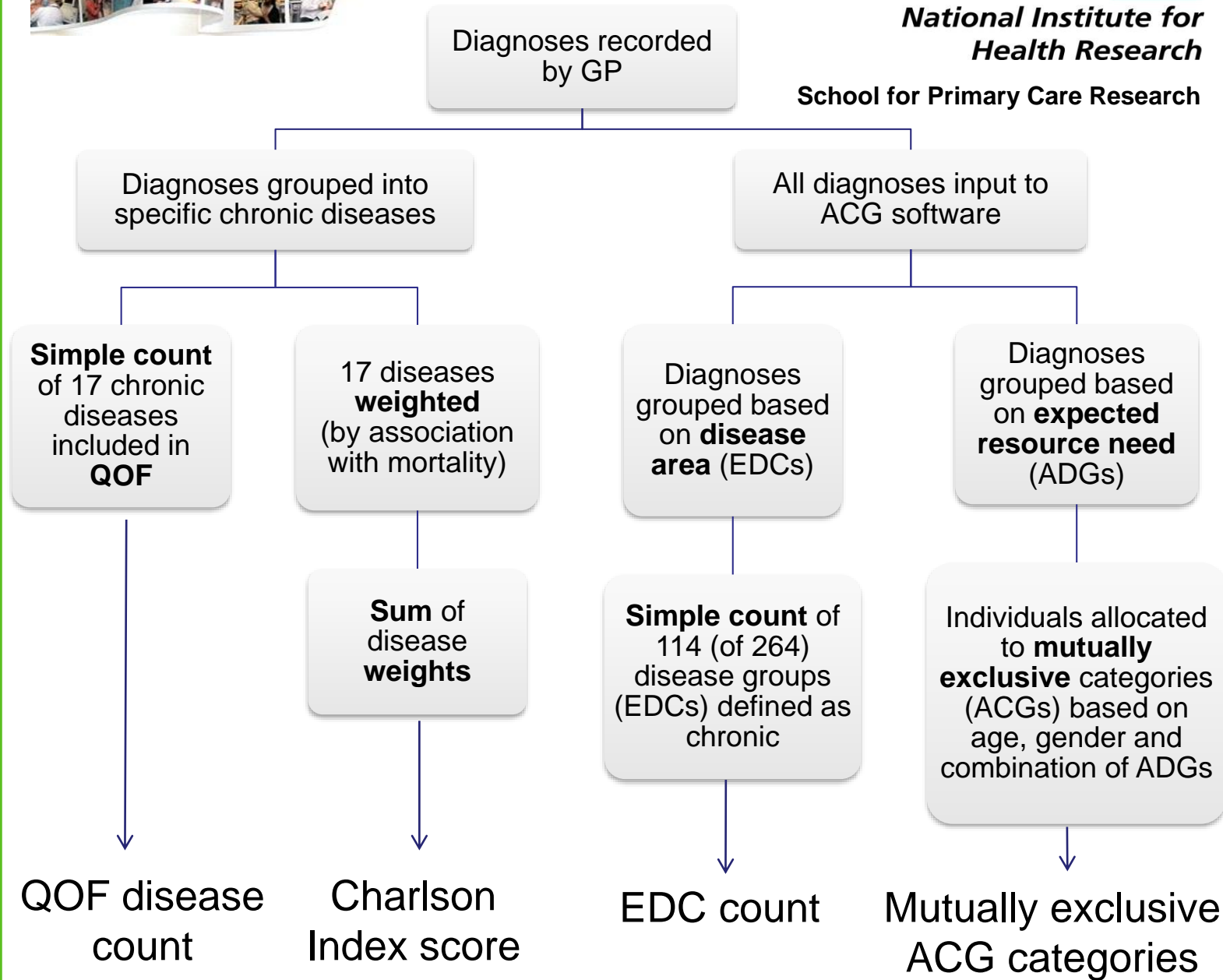
# Aim

- To explore the relationship between multimorbidity and the use of primary care resources in the UK
- Objectives:
  - How do different measures compare when used to predict primary care costs?
  - What is the nature of the relationship between multimorbidity and cost?



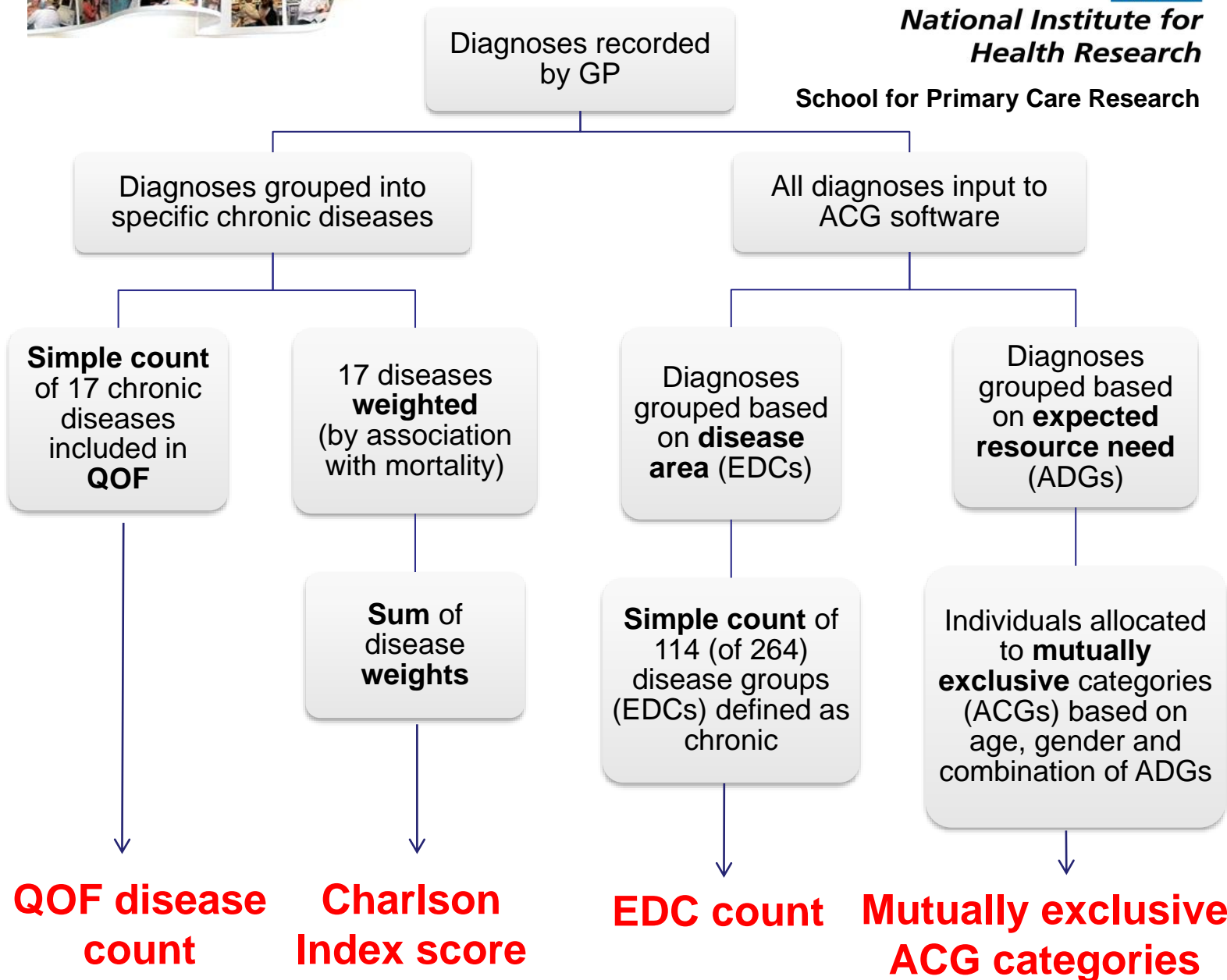
# Data

- General Practice Research Database (GPRD)
  - 86,100 patients from 174 practices
  - Diagnoses up until 31<sup>st</sup> March 2007
    - Used to measure multimorbidity
  - Resource use data for one year beginning on 1<sup>st</sup> April 2007
    - Used to estimate cost



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Diagnoses recorded by GP

Diagnoses grouped into **specific chronic diseases**

All diagnoses input to ACG software

**Simple count** of 17 chronic diseases included in **QOF**

17 diseases **weighted** (by association with mortality)

Diagnoses grouped based on **disease area** (EDCs)

Diagnoses grouped based on **expected resource need** (ADGs)

**Sum of disease weights**

**Simple count** of 114 (of 264) disease groups (EDCs) defined as chronic

Individuals allocated to **mutually exclusive** categories (ACGs) based on age, gender and combination of ADGs

**QOF disease count**

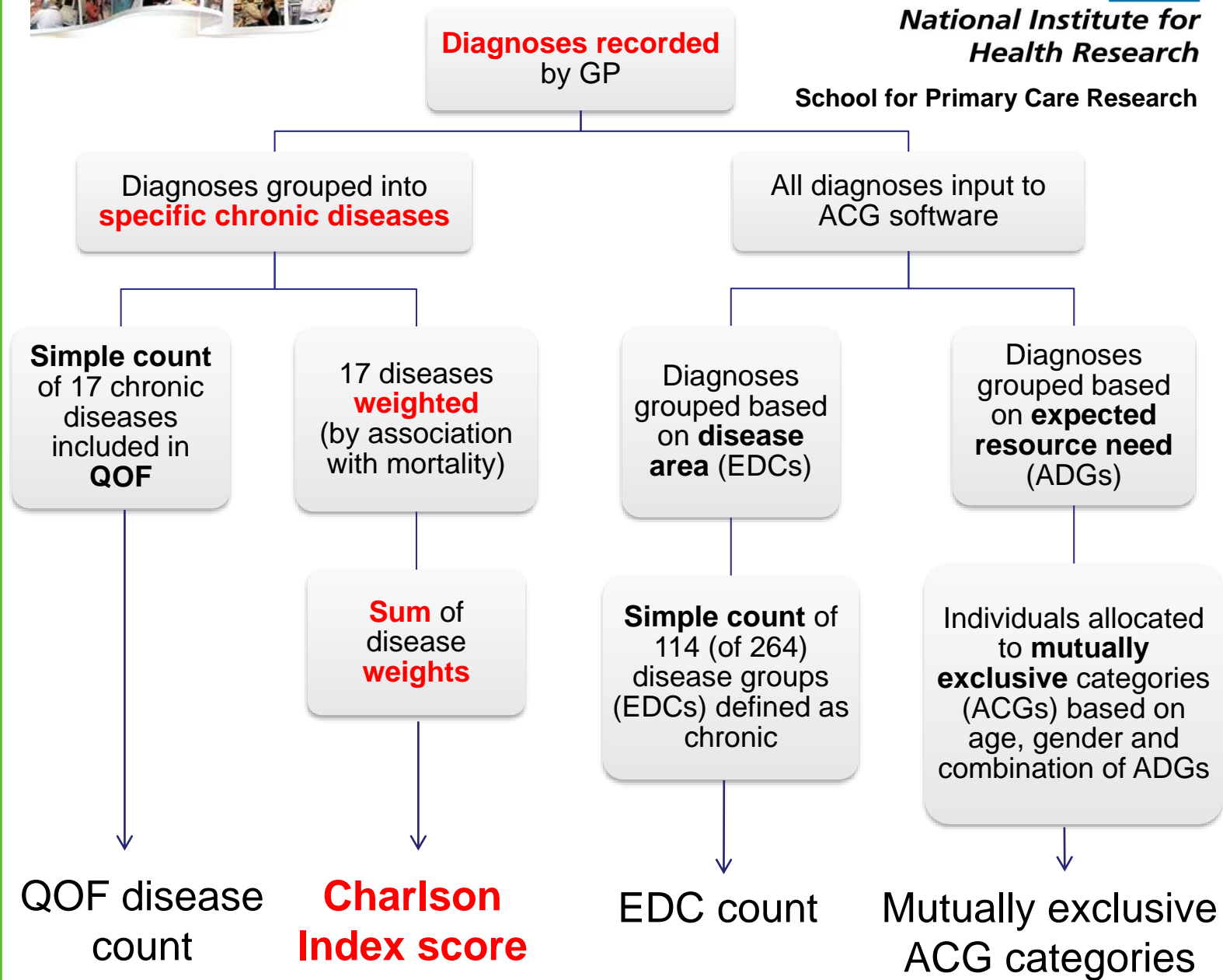
Charlson Index score

EDC count

Mutually exclusive ACG categories

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Diagnoses  
grouped based  
on **disease**  
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Diagnoses  
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**Sum of**  
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QOF disease  
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Charlson  
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**EDC count**

Mutually exclusive  
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# Costing Resources

Consultations



Prescription  
drugs



Total  
annual £  
per  
patient



Tests and  
investigations

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# Costing Resources

Consultations →

Combination of...  
**-Consultation type**  
(surgery consultation, home visit, clinic, out of hours, telephone) and...

- **Primary staff role** (GP, practice nurse, district nurse, physiotherapist, counsellor, etc.)

Additional cost for **administrative activities** performed by a receptionist, administrator, or secretary

+

Prescription drugs

+

Tests and investigations

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# Costing Resources

Consultations



Prescription  
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Tests and  
investigations

- Matched to cost using **drug name, strength** and **formulation**

- Cost based on total quantity prescribed (eg. number of tablets, number of millilitres for liquids)

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# Costing Resources

Consultations



Prescription  
drugs



Tests and  
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**In-practice** (during  
consultation):

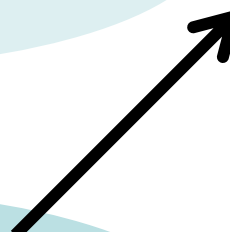
cost for consumables only (e.g.  
pregnancy tests or urine  
dipstick)

**Laboratory tests:**

cost by pathology discipline  
(source: NHS Reference  
Costs)

**Hospital based  
investigations:**

costed individually  
(source: NHS Reference  
Costs)



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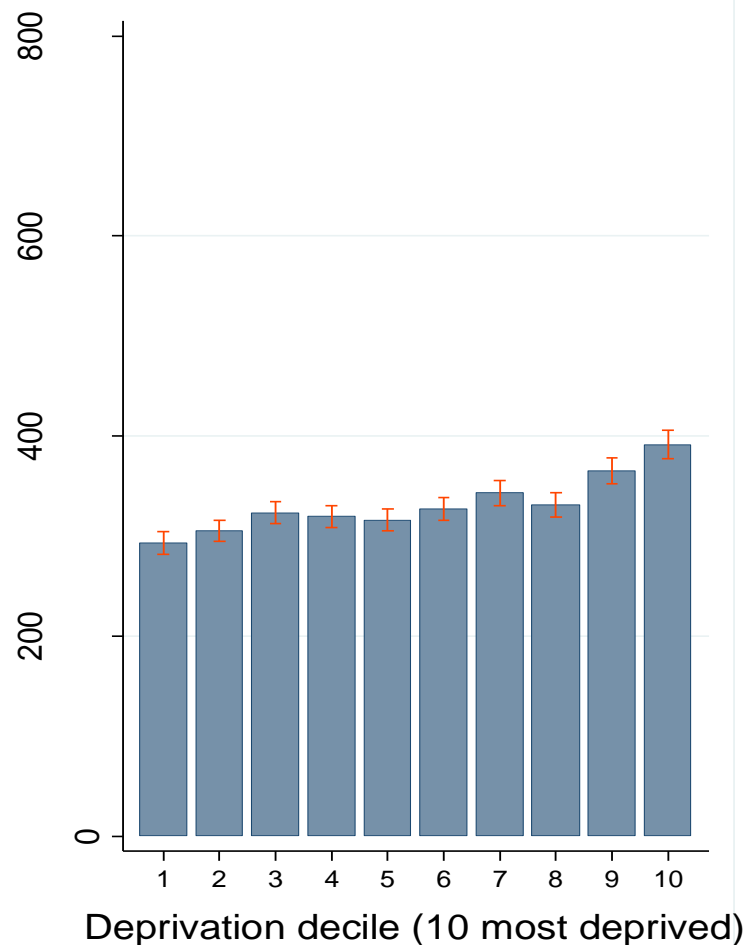
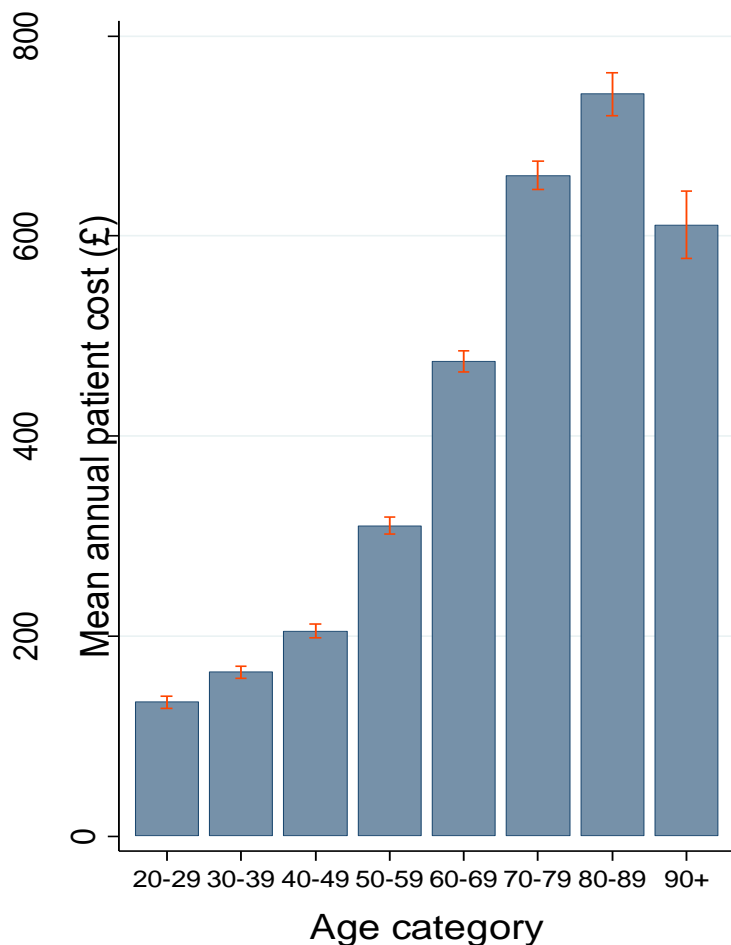




# Patient cost, by age category and deprivation decile

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# How well does each multimorbidity measure predict patient cost?

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Model	Deviance-based R-squared
Age, gender, deprivation, and practice	
+ Charlson Index score	
+ QOF disease count	
+ ACG categories	
+ EDC count	



# How well does each multimorbidity measure predict patient cost?

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Model	Deviance-based R-squared
Age, gender, deprivation, and practice	14%
+ Charlson Index score	21%
+ QOF disease count	27%
+ ACG categories	29%
+ EDC count	31%



# How well does each multimorbidity measure predict patient cost?

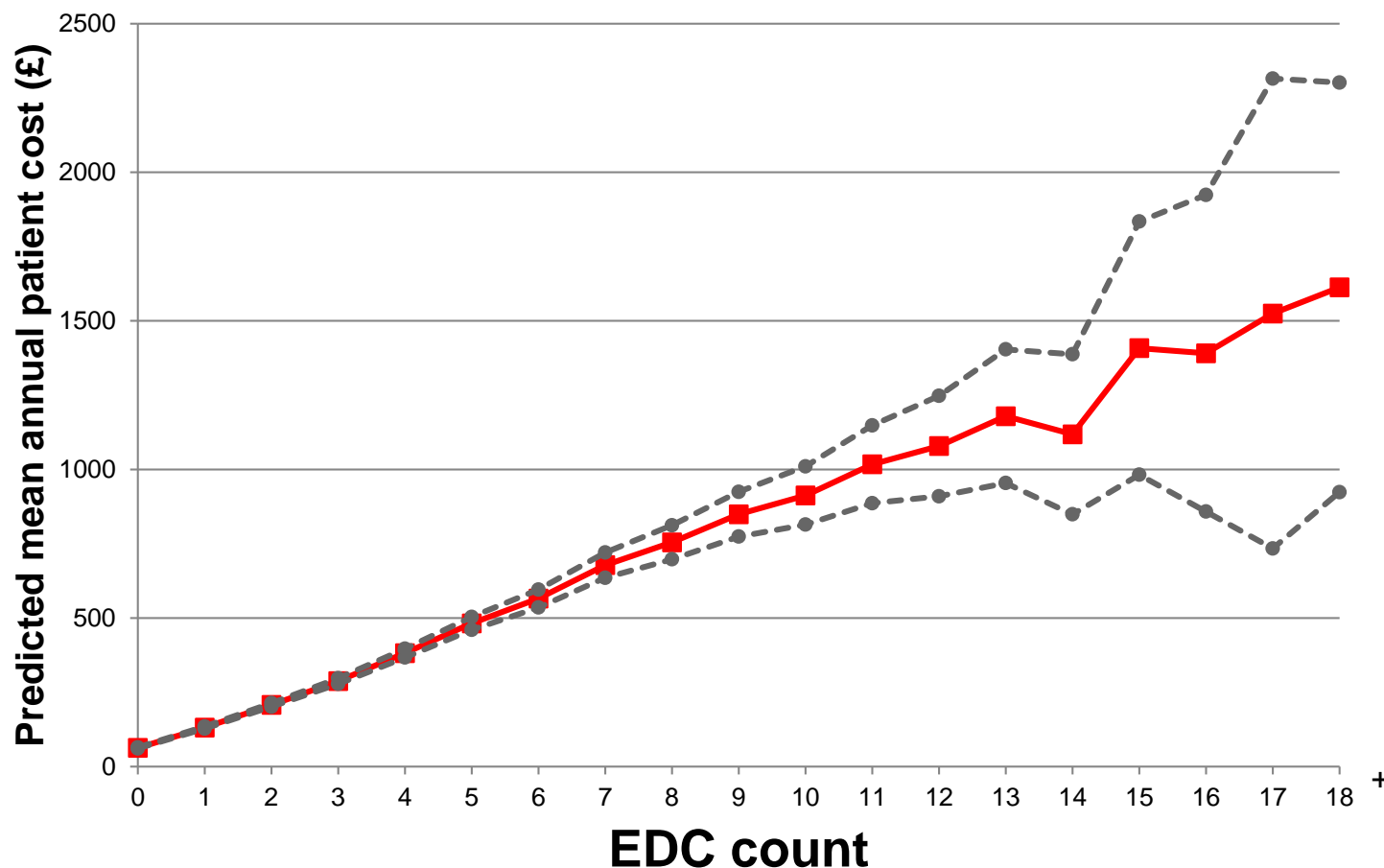
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# Predicted mean annual patient cost



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# Conclusions

- Including measures of multimorbidity improved model fit
- A count of Expanded Diagnostic Clusters (EDCs) performed best in a model predicting patient cost in primary care
- Increases in patient cost were roughly proportional to the number of EDCs



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**Thank you**

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