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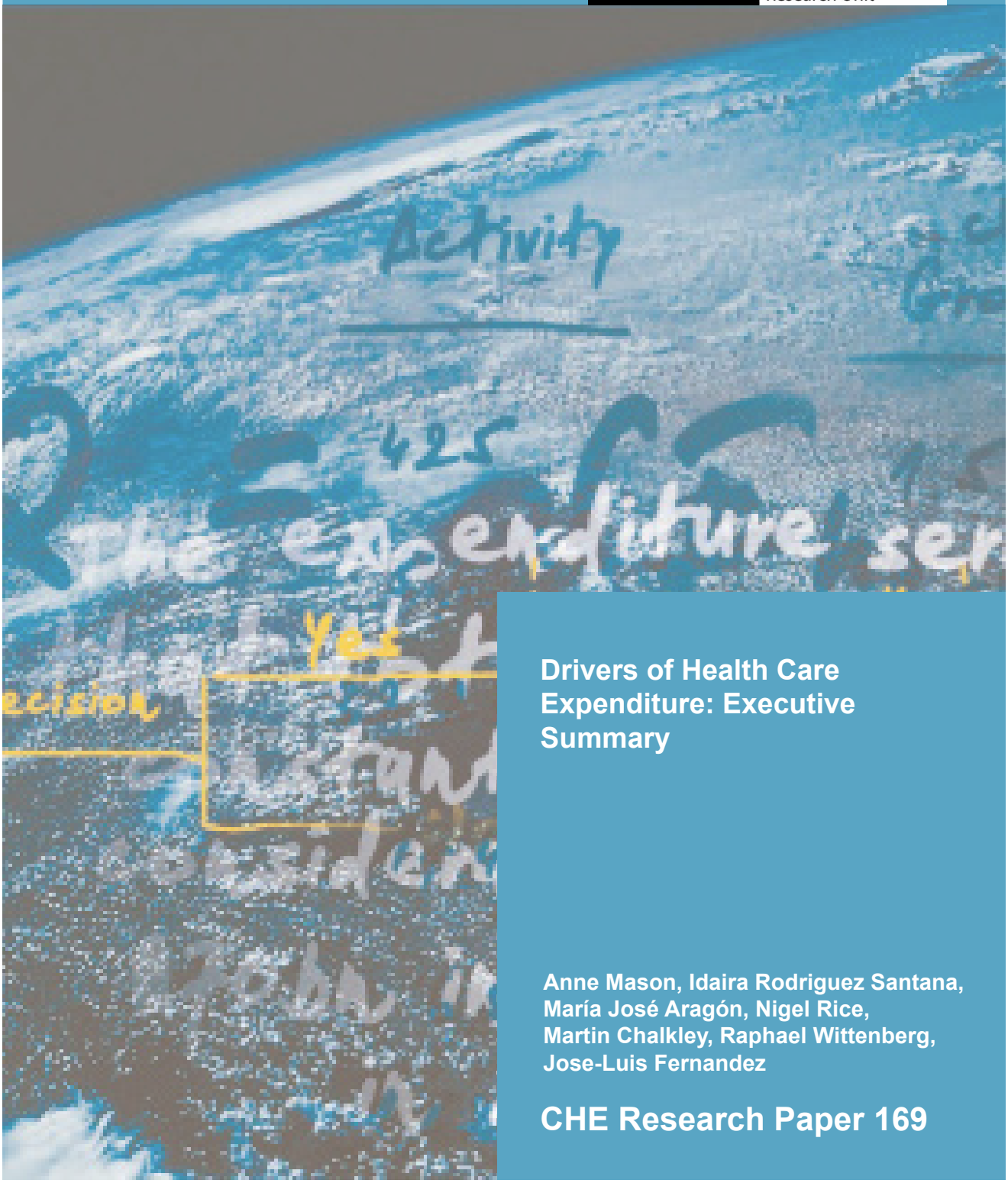

Drivers of Health Care Expenditure: Executive Summary

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Introduction

Since the NHS was established in 1948, growth in health care expenditure (HCE) has outpaced the rise in both GDP and in total public expenditure. Year-on-year rises in the real value of HCE are thought to be one of the greatest challenges to long-term fiscal sustainability. Known drivers of HCE growth include demographic factors, income and wealth effects, technology and cost pressures.

In this report, we aimed to address two research questions:

1. What are the drivers of past trends in health care expenditure in terms of demographic change, technology, rising expectations, pay etc. and how much has each of the drivers contributed to past increases in expenditure?
2. How much has each type of service, such as primary care, pharmaceuticals, emergency secondary care, elective secondary care etc., contributed to past trends in health care expenditure and why have there been different trends for different types of care?

Methods

We set out a conceptual framework for understanding drivers of HCE, placing it in the broader context of underlying drivers of demand and macroeconomic trends.

To address the first research question, we reviewed studies from higher-income countries published over the last decade.

To address the second research question, we analysed datasets compiled in-house of cost and volume of care by different settings. Where possible, we then linked evidence from the literature review on setting-specific drivers of HCE.

Drawing on these two data sources, we identified the challenges and opportunities for developing a model of healthcare demand and proposed our next steps.

Key results

The review identified 115 papers: 52 aggregate studies, 54 individual-level studies, 6 reviews and three methodological papers. Key findings are summarised below.

Aggregate studies (N=52), reviews (N=6) and methodological papers (N=3)

- Methodologies have become increasingly sophisticated since initial studies were published in the 1970s
- Most macroeconomic models take account of GDP, total public expenditure, prices and population aging, and recognise the challenges of analysing time-series data
- Models using longer panels of data suggest the relationship between HCE and its drivers is non-linear, varies over time and varies across countries
- The income elasticity of demand is generally estimated to be around or below 1, suggesting healthcare is a normal good. However, this estimate depends on the model being specified correctly, e.g. important factors, such as technological progress, are included
- Studies find strong positive relationships between HCE and technological progress, with the size of the effect varying across countries

- Countries that use health technology assessment (HTA) typically have higher levels of HCE, though this finding is likely to be endogenous ('reverse causality')

Individual level studies (N=54)

The outcome measures were HCE (40 studies), long-term care expenditure (LTCE) (N=4), cost-of-illness (N=4), service utilisation (N=5), and simulation of health outcomes (N=1).

Just eight studies (15%) were set in the UK. There are difficulties in transferring findings from other countries to the UK, not least because of differences in how services are defined, delivered and structured.

We were also unable to quantify the contribution of different drivers identified in the literature due to heterogeneity in their methods, but where possible we report relative contributions.

- 40 studies of **health care expenditure** (HCE)
  - Five studies were from England, two from Scotland and one used UK data
  - Studies controlled for age and gender (40/40), comorbidities (26/40), time-to-death (16/40), socioeconomic factors (18/40) and disabilities (10/40)
  - Studies were diverse in terms of their aims, methodologies, drivers investigated, definitions of HCE and settings in terms of care location and country
  - It was therefore not possible to summarise meaningfully across these studies, but their findings contribute to the review of setting-specific drivers
- 4 studies of **long-term care expenditure** (LTCE)
  - One of these studies was from the UK
  - Disability was shown to be an important driver of individual expenditure, and the proportion of years in severe disability was identified as a key factor driving aggregate LTCE – particularly affecting spend on institutional care
  - Adjusting for time-to-death (TTD) attenuated the effect of age on LTCE, but age remained a statistically significant drive
  - TTD as an explanatory variable for LTCE appeared largely redundant when disability was accounted for
  - Diseases differed widely in their impact on LTCE: for example, cancer deaths were associated with lower LTCE (other studies found a positive association between cancer and HCE)
  - Living alone and female gender were predictive of higher LTCE
- 4 **cost-of-illness** studies.
  - None of these studies were from the UK
  - Measuring morbidity and apportioning costs reliably are important when projecting future HCE, particularly if their prevalence grows at different rates
  - Comorbidity indices explained different aspects of HCE. Therefore, including several indices in a single model may improve model performance
  - Apportioning costs to coexisting diseases is complicated, and studies used different methods
- 5 studies of **service utilisation**
  - None of these studies was from the UK
  - Studies identified little overlap between factors that drive the decision to utilise care and those that drive the level of utilisation and /or expenditure

Setting-specific drivers of HCE

Most evidence related to hospital-based care, particularly inpatient expenditure. There was some evidence on drivers of expenditure on primary care and community prescribing. There was a lack of evidence on drivers in many other settings.

Inpatient expenditure

- In England, expenditure on inpatient care rose by 39% from 2008/09 to 2016/17, with non-elective care rising more rapidly than other types of care
- On average, annual growth in volume (2.3%) and costs (1.9%) were similar
- Evidence from England and the Netherlands showed that changes in the value of the drivers were more important in explaining changes in inpatient expenditure than changes in the relationship between the drivers and HCE
    - The key driver was changes in the composition of activity, particularly the rise in day case admissions, shorter inpatient stays and (in the Netherlands) greater use of outpatient clinics
    - Demographic changes had little discernible impact in either country
    - Changes in morbidity prevalence had a large impact on costs in England, but the Dutch study found the effect was negligible
- There was no robust evidence that better health and/or healthier lifestyles can counteract future rises in inpatient expenditures
- The effect of time-to-death (TTD) on HCE was mixed
    - Evidence from England showed that TTD dominated age as a driver of inpatient expenditure, but that morbidity dominated TTD
    - However, other studies on people at the end of life (decedents) found that age remained an important driver, with HCE typically higher in younger than older decedents
    - A Dutch analysis showed the predictive power of TTD varied by disease: for example, it was strongly predictive of higher inpatient expenditure for cancer patients, but performed less well for non-fatal chronic conditions
- Factors explaining the probability of utilising inpatient care did not necessarily predict expenditure

Outpatient expenditure

- In England, total outpatient expenditure rose by 57% from 2008/09 to 2016/17, driven by rises in both volume (43%) and costs (9%)
    - The move from PCTs to CCGs affected the quality of Reference Cost reporting.
- The two studies on drivers of outpatient care were from the US and Spain
- Factors driving the probability of utilising outpatient care did not necessarily predict expenditure
- Evidence from Spain identified age, insurance status, self-assessed physical health and functional limitations as drivers of outpatient expenditure

Primary care expenditure

- Primary care is one of the largest settings in the NHS and accounted for 10.4% of the total expenditure in 2016/17
- Discontinuities in the data sources and reporting mean is it difficult to get a reliable picture of HCE trends for this setting
- Morbidity and health status were important drivers of primary care expenditure. They also predict utilisation

- Limited evidence suggests that age remains an important driver of expenditure, even after adjusting for proximity to death
- Healthy aging is unlikely to be sufficient to curb growth in primary care expenditure
- An English study found that greater deprivation was predictive of higher expenditure, after controlling for morbidities and other factors

Community prescribing expenditure

- From 2008/09 to 2016/17, community pharmaceutical expenditure – from prescriptions written by GPs, nurses or other health care professionals who work in the community – rose by 10%. Volume grew by 45% and costs declined by 24%
- Our review did not identify any UK studies of drivers of community prescribing expenditure
- A Dutch study found that growth in expenditure occurred mainly in the highest cost cases, driven by factors such as technological progress
- Several studies showed that accounting for time-to-death reduced the impact of age
    - The effect of age remained an important explanatory factor and appears to be non-linear; those dying at a younger age had higher per capita expenditure than older decedents
    - At the individual level, health status was an important predictor of expenditure

We identified no individual-level analyses on drivers of expenditure on chemotherapy, radiotherapy, radiology, high-cost drugs, rehabilitation or most community services. This lack of evidence is a concern: in England, spend on chemotherapy and on high-cost drugs more than doubled over the last decade (from 2008/09 to 2016/17, spend rose by 113% and 231% respectively).

Towards a projections model of health care expenditure

We have identified four lessons from the study that could inform decisions on building projection models of HCE.

1. Mechanisms that shape demand are complicated, and may be complex

- there is some inherent unpredictability involved in the process of 'projecting' future expenditures and future demand for health care – not simply uncertainty around point estimates of effect size

2. Methodology matters

- Identifying the factors driving demand is just a first step: the way they are measured and the model with which they are analysed are likely to affect their projected effects on future demand. Potential interactions should also be captured

3. The pathway linking demand to HCE needs to be explicit

- Drivers of utilisation may differ from drivers of expenditure – even within the same care setting
- Microsimulation models offer potential advantages, but also have drawbacks. Their added value, costs and feasibility should be carefully considered

4. Data challenges should not be underestimated

- Models are dependent on the quality, availability and coverage of routine datasets and surveys
- When reporting projections of HCE, uncertainties should reported, and, if possible, quantified