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Gebreiter, Florian; Ferry, Laurence

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Accounting and the ‘Insoluble’ Problem of Health-Care Costs

FLORIAN GEBREITER* and LAURENCE FERRY**

**Aston Business School, Aston University, Birmingham, UK and **Durham University Business School, Durham University, Durham, UK*

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ABSTRACT Health service accounting reforms are frequently promoted, explained or justified with reference to aging populations, expensive medical technologies and their purported implications for the cost of health care. Drawing on Foucault’s genealogical method, we examine the emergence of concerns regarding health expenditure in the wake of the creation of the British National Health Service in 1948, and their relationship with health service accounting practices. We argue that concerns regarding the cost of health care are historically contingent rather than inescapable consequences of demographic and technological change, and that health service accounting practices are both constitutive and reflective of such concerns. We conclude by relating our analysis to current attempts to control costs and increase efficiency in the health services.

Introduction

It is widely believed that health expenditure, which already accounts for more than 10% of GDP in many countries,¹ will increase further due to aging populations, increasingly expensive medical technologies and their mutual interactions. Specifically, the concern is that as more expensive and effective health care allows people to live longer, they require yet more health care and incur yet more health expenditure. This purported relationship between demographic change, technological advances and health expenditure lies at the heart of suggestions that the cost of health care is an ‘insoluble’ problem (Roberts, 1952).

Concerns about the cost of health care form an important part of the social and institutional environment of hospital accounting. Many publications use health care costs to promote, justify, explain or contextualize accounting changes in the health services (e.g. Cardinaels & Soderstrom, 2013; Chapman, Kern, & Laguecir, 2014), often with specific reference to the above mentioned purported relationship between aging populations, medical advances and health expenditure (e.g.

Correspondence Address: Florian Gebreiter, Aston Business School, Aston University, Aston Triangle, Birmingham B4 7ET, UK. Email: f.gebreiter1@aston.ac.uk

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¹In 2012, Britain spent 9.3% of its GDP on health services, France 11.6%, Germany 11.3% and the United States 17% (World Health Organization, 2015).

Hopwood, 1992; Jones & Mellett, 2007; Kurunmaki, Lapsley, & Melia, 2006; Lapsley, 2001; Organization of Economic Co-operation and Development, 2000). Despite their ubiquity and apparent importance to accounting in the health services, accounting researchers have yet to critically examine concerns regarding the cost of health care and their implications for hospital accounting.

Following a rich tradition of Foucauldian research in accounting (e.g. Hopwood, 1987, 1992; Jeacle, 2014; Miller, 1998; Sargiacomo, 2008; Walker, 2010), we draw on the genealogical method (Foucault, 1977, 1991; Miller & Napier, 1993) to examine concerns regarding the cost of health care and their relationship with accounting practices. Genealogies seek to challenge generally accepted ideas and practices such as current concerns regarding health expenditure or the perceived need for managerial accounting practices in hospitals, by rediscovering the complex of connections, forces and encounters which led to their emergence. By exposing the often accidental and messy nature of their emergence, genealogical studies can show that such ideas and practices are neither universal nor inevitable, but are contingent and contestable.

In the present study, we trace how discourses which conceptualized health expenditure in various ways and 'humble and mundane' (Miller & Rose, 2008, p. 63) practices like accounting interacted to give birth to concerns regarding the cost of health care and the perceived need for managerial hospital accounting practices in mid-twentieth-century Britain. Drawing on an analysis of 761 documents collected from professional journals, government reports and other sources,² we show how perceptions of health expenditure transformed from a profitable investment in the productive capacities of the nation to an insoluble socioeconomic problem, threatening to bankrupt the country. Managerial hospital accounting reforms, meanwhile, transformed from the pet project of a handful of enthusiasts to a national priority embraced by government, hospital administrators and even doctors.

The paper offers several conclusions and contributions. Firstly, we show that current concerns regarding the cost of health care are historically contingent rather than inevitable consequences of aging populations and increasingly expensive medical technologies. Specifically, we argue that the nationalization of health services, together with the compilation of health estimates and changing notions of health and disease, constituted the cost of health care as an insoluble problem in the mid-twentieth century.

Secondly, we show that accounting is both constitutive and reflective of concerns regarding the cost of health care (Hopwood, 1987, 1992). We argue that the publication of government health estimates³ from 1949 onwards was an important factor in the emergence of concerns regarding health expenditure, which in turn led to the nationwide introduction of a managerial hospital costing system in 1957. We place particular emphasis on the role of health estimates in the emergence of worries about health expenditure and argue that by aggregating the costs of individual health-care providers into one national figure, the health estimates compiled by the Ministry of Health gave visibility to the hitherto unknown costs of health care to the nation.

²Specifically, we collected articles from professional journals including the *British Medical Journal*, *The Accountant*, *The Hospital* and *The Lancet* relating to the period between the publication of the 'Report on the British Health Services' (Political and Economic Planning, 1937) and the introduction of the departmental hospital costing system in 1957. With regard to the *British Medical Journal* and *The Lancet*, we identified relevant articles by searching these publications' digital archives for keywords and phrases (e.g. 'cost accounting', 'costing', 'cost of health', 'health expenditure' and 'health estimates'). We searched *The Accountant* and *The Hospital* manually and identified relevant articles by reading the title of every article published in these two journals between 1937 and 1957. The authors also identified several relevant books, government reports and other publications by following references from these articles. Finally, we inductively developed a set of categories according to which we manually coded the materials collected for the present study.

³In the British public sector, the term 'estimates' is widely used to describe budgets. The term 'health estimates' refers to the annual NHS budget that is put before Parliament for scrutiny and approval.

The publication of these estimates both triggered and framed concerns regarding health expenditure, which dominated public debate on the newly created National Health Service (NHS), whilst issues such as the effectiveness, equity and humanity of health services were marginalized. These findings are particularly interesting because they contradict the widely held view that, before the rise of New Public Management (NPM), accounting was merely descriptive but not constitutive of public sector organizations (e.g. Hopwood, 1984). Our discussion also provides a rare example of the constitutive power of 'macro' rather than 'micro-managerial' accounting practices (cf. Napier, 2006; Suzuki, 2003) and shows that their transformative power extends into social domains like the health services.

Thirdly, we show that, in a centralized, single-funder health system, the simple accounting and budgeting arrangements adopted by the NHS helped to reduce health expenditure in the early 1950s. This contrasts with decentralized, multi-funder health systems, such as the pre-NHS British health services or the current American health system, in which accounting is frequently used in a strategic manner to increase revenues rather than decrease costs (e.g. Cardinaels & Soderstrom, 2013; Eldenburg & Kallapur, 1997; Gorsky, Mohan, & Powell, 2002). We argue that hospitals have greater scope and incentives to use accounting strategically in decentralized, multi-funder health systems, and caution that current reforms promoting the decentralization of health services in Britain and beyond (e.g. Prime Minister's Office, 2011) could reduce rather than increase accounting's ability to facilitate the control of health service costs.

Finally, we argue that both in the 1950s and the present day, concerns regarding aging populations, expensive medical technologies and the cost of health care have focused much attention on accounting practices that seek to encourage hospitals to provide various health services at the lowest possible cost (i.e. maximize their technical efficiency). Numerous accounting studies have examined to what degree this has been successful (e.g. Borden, 1988; Eldenburg & Kallapur, 2000). Conversely, the questions whether hospitals use the most efficient mix of inputs to provide these services (i.e. maximize the allocative efficiency of health service inputs), and whether hospitals produce those services which provide the greatest health benefits relative to their costs (i.e. maximize the allocative efficiency of health service outputs), have attracted little attention in the accounting literature.⁴ We point towards suggestions that especially the latter of these two questions will assume increasing importance in the health policy arena (e.g. Health Foundation, 2015) and call upon health service accounting researchers to engage more closely with questions relating to allocative efficiency.

The remainder of the paper is structured as follows. In the next two sections, we discuss relevant literatures and the historical context of the present study. We subsequently examine the emergence of concerns regarding the cost of health care and the related rise of managerial hospital accounting practices in the early years of the NHS. We conclude with a discussion of our findings and their implications.

Literature Review

Two sets of literatures are of particular relevance to the present study. The first set addresses the purported relationship between aging populations, medical progress and the cost of health care, which has fueled much public debate on the future sustainability of the health services and motivated calls for radical reform (e.g. Economist Intelligence Unit, 2011; Prime Minister's Office, 2011; Timmins, 2008). Despite the ubiquity of such debates, little scientific evidence

⁴See Street, O'Reilly, Ward, and Mason (2011) for further definitions of technical and allocative efficiency as well as a detailed discussion of these concepts from a health economics perspective.

supports such a link. On the contrary, social and medical scientists have used social security data and statistical methods to question this purported relationship. Regarding the link between age and the cost of health care, some studies have demonstrated that health expenditure does not depend on people's age but on their proximity to death (e.g. Zweifel, Felder, & Meiers, 1999). Others have shown that people's healthy life spans have increased faster than their life expectancies (e.g. Fries, 1989). Both findings suggest that increases in life expectancy do not automatically translate into increases in health expenditure. Regarding the effects of science and technology on health expenditure, there appears to be a tentative consensus amongst medical and social scientists that they have contributed to health-care cost inflation over the last few decades. However, research has also shown that the uptake of expensive medical technologies is often determined by financial incentives and the availability of specialists rather than by clinical need, suggesting that large amounts of science-related health expenditure could be avoided (e.g. Weisbrod, 1991).

The second set of studies addresses the extent to which hospital accounting practices reflect and constitute their social and institutional environment. Regarding its reflective properties, research has shown that hospital accounting can be affected by factors as diverse as the historical development of the Finnish accounting profession (Kurunmaki, 2004), the attitudes of doctors (Bourn & Ezzamel, 1986) and the separation of inpatient and outpatient care in Germany (Soderstrom, Eldenburg, & Ernst, 2006). Additionally, the accounting literature almost routinely relates concerns regarding the cost of health care to hospital accounting reforms. Numerous papers reference the purported relationship between demographic change, technological progress and the cost of health care to contextualize or explain accounting change in the health services (e.g. Hopwood, 1992; Jones & Mellett, 2007; Lapsley, 2001). Whilst the academic literature has linked the above mentioned social and institutional factors to hospital accounting on the basis of rigorous research, suggestions that accounting reforms are driven by interactions between aging populations, medical science and the cost of health care are frequently based on little more than the common-sense appeal of the argument.

The extant literature has also addressed the constitutive properties of hospital accounting practices. Several studies have suggested that, historically, hospital accounting has not shaped the environment in which it operated (e.g. Bourn & Ezzamel, 1986; Robson, 2003). These studies portrayed accounting as a marginal practice that was concerned merely with recording, rather than infiltrating or changing, the activities of the health services (Hopwood, 1984). This changed dramatically with the emergence of NPM and associated hospital accounting reforms in the 1980s. Many studies have argued that the introduction of accounting practices like clinical budgeting and diagnosis-related groups (DRGs) had significant constitutive effects in the health services (e.g. Chua, 1995; Gebreiter, *in press*; Llewellyn & Northcott, 2005; Lowe & Doolin, 1999).

Similar to earlier research in the industrial setting (e.g. Hopwood, 1987; Miller & O'Leary, 1987), studies that documented the constitutive power of accounting in the health services focused on the organizational level and 'micro-managerial' accounting practices (Napier, 2006; Suzuki, 2003). However, the use of accounting is not limited to the organizational level. Bodies like the British government, the European Union and the Organization of Economic Co-operation and Development compile accounts relating to the national, regional and global levels. With the exception of Suzuki (2003), who suggests that the creation of national accounts in Britain was centrally implicated in the development of macroeconomics, macro-accounting practices and their potential roles in shaping modern societies have attracted little attention from accounting researchers (Napier, 2006). In particular, the potentially constitutive power of macro-accounting practices in social domains like health services remains largely unexplored.

This paper seeks to contribute to both sets of literature. It further scrutinizes the purported relationship between aging populations, medical technology and health expenditure by examining it from a historical perspective, and it explores the relationship between accounting and concerns regarding the cost of health care with reference to the constitutive and reflective properties of accounting practices.

Historical Context: Health Expenditure and Hospital Accounting Before 1948

The Cost of Health Care Before the NHS

In the 1930s, both the provision and funding of health care in Britain were highly fragmented. An array of health service providers (e.g. voluntary, municipal, cottage and infectious disease hospitals, general practitioners, medical officers of health) were funded by a range of sources including central government and local authority grants, national and private insurance schemes, subscriptions, donations, investments and fees for service (e.g. MacKeown, 1942). The cost of health services was a concern for individual health-care providers and patients, but it was not perceived as a macroeconomic problem.⁵ Indeed, due to the fragmented nature of the health services and their funding arrangements, the cost of health care to the nation was unknown.

The first attempt to measure the total costs of health care to the British economy was undertaken by Political and Economic Planning (1937).⁶ Their report described the funding of the health services as 'obscure and little understood' (p. 409) and pointed to the 'grossly excessive number of channels from which the finance of many health services is drawn' (p. 27). After years of extensive research, the report estimated the cost of health services in Britain at £185m a year, or 4% of national income.

Political and Economic Planning (1937) expressed no concerns regarding the cost of health care. Instead, it emphasized the 'cost of ill-health', which, once the value of work lost because of disease was included, was estimated to be at least £300 million a year (p. 387). In light of this perceived burden of illness on the economy, the report called for increased health expenditure: '£1 of new expenditure at a strategic point, although apparently difficult to "afford", may well save several pounds' worth of existing expenditure' (p. 27). The perceived economic benefits of greater health expenditure were also highlighted by subsequent sources, including the government's Chief Medical Officer, who suggested that investment in health 'pays higher dividends, to the individual and the nation, than any other form of investment' (Jameson, 1943, p. 142).

Whereas commentators emphasized the perceived economic benefits of health expenditure, the cost of health services inspired little debate in the late 1930s and early 1940s. As plans to introduce a socialized medical service took shape, several sources published cost estimates for such a service. The Beveridge Report (Beveridge, 1942), for example, estimated a cost of £170m. The NHS White Paper (Ministry of Health, 1944) and the financial memorandum of the NHS Bill (Ministry of Health, 1946) calculated figures of £132m and £152m, respectively.⁷

⁵In the United States, where state funding of health services was largely restricted to federal grants for specific programs like maternity plans during the inter-war years, the cost of health care was similarly perceived as a problem for individuals and hospitals rather than for the state (Maslow, 1939).

⁶Political and Economic Planning was founded in 1931 by influential figures from business, government and science. Its aim was to promote rational planning approaches to a range of public policy issues including housing, education, international trade and the health services.

⁷Cutler (2000) suggested that these estimates were extrapolated from National Health Insurance data for 1938. The differences between them reflected changing assumptions about the service, including its funding (entirely free at the point of

Yet, despite the desperate state of public finances in war-torn Britain and the prospect of making the nation's medical services available to the entire population free at the point of use, few sources questioned the affordability of the proposed NHS.

Social Medicine, Positive Health and the Nature of Health and Disease

The emergence of economically beneficial notions of health expenditure reflected a shift from biomedical to sociomedical conceptions of health and disease in the 1930s. The biomedical model had dominated medicine since the early nineteenth century, when doctors at Parisian hospitals first related the signs and symptoms of disease to local pathological changes identified in postmortem examinations. Under this approach, death and disease became the 'essence of medical inquiry' (Porter, 1999, p. 307). Health, on the other hand, came to be defined in negative terms. Bichat, a leading Parisian doctor, called it 'the sum of all the functions by which death is resisted' (cited in Porter, 1999, p. 307).

By the early twentieth century, the biomedical approach had helped clinicians develop detailed knowledge of the precise pathological changes leading to various diseases. Yet, this greater understanding did not translate into an increased ability to cure disease. Meanwhile, public health initiatives like regular garbage collections and sewer construction led to significant declines in mortality. Against this background, the narrow, mechanistic and morbid focus of the biomedical paradigm was attacked and came to be labeled 'the cult of negative health' (Mabery, 1943, p. 55).

These attacks were spearheaded by the proponents of social medicine, who argued that medicine should focus less on the 'immediate [biomedical] causes of disease' and more on its 'ultimate' social causes, such as malnutrition, overcrowding and poor education (Ryle, 1942, p. 109). They suggested that disease could be conquered and replaced with 'positive health' if housing, food and education were improved and a socialized health service was created (e.g. Beveridge, 1942; Ryle, 1942). Such ideas achieved much support among Britain's medical elites (e.g. Buzzard, 1942; Jameson, 1943) and played an important role in the nationalization of the health services (e.g. Beveridge, 1942).

The emergence of social medicine and its underlying sociomedical model of disease had significant implications for the manner in which health expenditure was perceived prior to the creation of the NHS. By establishing a socialized health service and by addressing the sociological determinants of disease, social medicine aimed to combat existing disease and prevent future disease. Together, these two measures would have huge economic benefits by reducing the cost of illness and creating a healthier and more productive workforce. Whereas these benefits would be permanent, the increases in health expenditure would be temporary. Once the backlog of existing disease had been cleared and the sociological causes of disease addressed, the incidence of disease in the population and the associated need for health expenditure would decrease markedly. Health expenditure was thought to be self-limiting (e.g. Beveridge, 1942).

Hospital Accounting Before the NHS

In the nineteenth century, Britain's hospital accounting practices were similarly fragmented as its health services. Most hospitals used their own, customized accounting systems (Jones & Mellett, 2007). At the turn of the twentieth century and at the behest of the King's Fund, a

use or co-payments for various services), geographical scope (the entire United Kingdom or just England and Wales), coverage (the whole population or priority groups) and the availability and pay of consultant physicians.

leading provider of charitable health service funding, several hospitals adopted Burdett's (1893) *Uniform system of accounts*. This system classified expenditure into around 60 categories (e.g. salaries, drugs and meat) and calculated a cost-per-inpatient-day ratio for the entire hospital. This approach was mainly concerned with accurate recordkeeping and stewardship, and became known as the 'subjective' system because it arranged costs according to the subject on which they were expended (Robson, 2003).

Stone (1936) suggested that Burdett's 'subjective' system was inadequate for the increasingly large and complex hospitals of the 1930s.⁸ Specifically, he suggested that Burdett's system did not provide a 'reliable guide for intelligent consideration of efficiency and economy' and that it ignored the 'true function of accounting, which is to control administration and to assist the administration to control' (Stone, 1936, p. 6). Stone (1936) proposed an alternative approach based on the calculation of unit costs for various hospital departments (e.g. cost per meal served for the kitchen department), which he argued would promote efficiency and economy in the health services.

British hospitals did not widely adopt Stone's departmental approach. With an array of potential funding sources at their disposal, hospitals preferred to address financial difficulties by attempting to increase their income rather than curtail their expenditure. Against this background, many hospitals prepared their financial statements in a manner that overstated deficits, as they found it easier to elicit additional charitable contributions if they could point to a severe financial shortfall in their accounts (e.g. Gorsky et al., 2002; Jones & Mellett, 2007). Thus, hospital accounts were often used in a strategic manner to increase revenues rather than control costs (cf. Cardinaels & Soderstrom, 2013).

The passing of the NHS Act in 1946 and the prospect of a fully state-funded health service did not significantly increase interest in hospital accounting or other potential mechanisms for controlling health-care costs. Occasional calls for the introduction of departmental costing (e.g. 'Hospital accounts,' 1946) did not resonate with the government or hospital management committees. We argue that this lack of interest reflected sociomedical notions of health and disease and associated conceptions of health expenditure. At a time when health expenditure was perceived as transient, self-limiting and economically beneficial, the introduction of managerial hospital accounting practices was not seen as a priority.

Accounting and the Emergence of the Problem of Health-Care Costs

The Cost Crisis

The NHS was created on 5 July 1948. Parliament made £150m available to fund the NHS for the remainder of the 1948–1949 financial year ('Cost of the health services,' 1948).⁹ Barely a week earlier, Parliament had approved Statutory Instrument 1414 (S.I. 1414), which included regulations for 'Hospital Accounts and Financial Provisions' (Ministry of Health, 1948). S.I. 1414

⁸Captain Joseph Edmund Stone was a Fellow of the Society of Incorporated Accountants and Auditors and held several high-profile appointments, including chief accountant at St. Thomas's Hospital in London and secretary to the King's Fund.

⁹The financial year of British government organizations runs from April to March. £150m referred to the net cost of the NHS to the Treasury, which was the figure most widely discussed in Parliament and professional journals in the late 1940s and early 1950s. The NHS cost figures in the subsequent paragraphs refer to the net cost of the service. The gross cost of the service was rarely discussed during health expenditure debates in the early years of the NHS, and it was not customary to express the cost of health care as a percentage of GDP. It was only with the publication of the Guillebaud Report (Ministry of Health, 1956) that a systematic consideration of NHS costs in relation to national income was published. This report estimated that the cost of the NHS was 3.51% of GDP in 1948–1949.

instructed all NHS hospitals to submit accounts showing their expenditure for the current financial year to the Ministry of Health by December of each year. These accounts were prepared according to the traditional 'subjective' system and subsequently used by the Ministry to calculate the aggregate budget for the NHS, which was known as the health estimates.

The nationalization of the health services in July 1948 had no immediate effects on health expenditure discourses. The cost of the NHS was neither the subject of wider debates nor concerns during the first six months of the fully state-funded service. This changed abruptly in early 1949, when the Ministry of Health processed the accounts submitted as required by S.I. 1414 and it became apparent that £150m was insufficient to support the NHS until the end of the financial year 1948–1949. In consequence, the Minister of Health petitioned Parliament for a supplementary estimate of £58m in February 1949. The supplementary estimate marked the initial emergence of concerns regarding the cost of health care to the nation (e.g. Assheton, 1949; 'Costs and policy,' 1949).

Such concerns escalated in the next financial year, when the Minister of Health petitioned Parliament for a supplementary estimate of £99m in addition to the initial 1949–1950 NHS budget of £259m. This second large supplementary estimate within two years precipitated a sense of crisis. In the parliamentary debate about the estimate, the Chancellor seemingly conceded that health expenditure was increasing too fast and imposed a cap of £400m on the NHS budget (Cripps, 1950). *The Lancet* noted that, including the supplementary estimate, the cost of the NHS had reached £358m, which was described as a 'colossal burden on the taxpayer' ('Hospital finance,' 1950, p. 499). *The Accountant's* commentary on the revised health estimates concluded that health expenditure had reached 'almost astronomic heights' ('Hospital cost accounting,' 1950, pp. 257–258), whilst the *British Medical Journal* suggested that health-care costs had 'got completely out of hand' ('Cost of the NHS,' 1950, p. 656) and that the NHS was 'heading for the bankruptcy court' ('A failing policy,' 1950, p. 1262). After large supplementary estimates in 1948–1949 and 1949–1950, the cost of the NHS remained within the Chancellor's budget ceiling for the subsequent three financial years ('Health service costs,' 1953; 'The estimates,' 1954). Even so, health expenditure remained a significant concern, and the health estimates published by the Ministry of Health continued to provide an important reference point for debates on the cost of health care in the early and mid-1950s (e.g. Abel-Smith & Titmuss, 1956; 'Health service costs,' 1953; Ministry of Health, 1956; 'The health service estimates,' 1953).

Spending £400m on health services appeared excessive to many in post-WWII Britain. Yet, neither the level of health-care costs nor the seemingly rapid increases in health expenditure provides a simple explanation for the emergence of concerns regarding health expenditure in the early years of the NHS. Indeed, Eckstein (1958) remarked that the cost of health care was higher and had risen more sharply in other countries during the 1940s and 1950s without causing similar concerns.

We argue that the nationalization of the health services and the associated creation of national health estimates played an important role in the emergence of concerns regarding health expenditure. With the creation of the NHS, multiple 'obscure and little understood' (Political and Economic Planning, 1937, p. 409) channels of health-care funding were replaced by a single source, the state. Health expenditure became a matter of public debate and came into direct competition for state funding with other public services like education or welfare. Additional health-care funding could no longer be procured by appealing to wealthy benefactors with the help of hospital accounts which had been strategically adjusted to show large deficits. Under the NHS, all increases in health expenditure had to be debated and approved by Parliament.

Moreover, we argue that the accounting and budgeting systems of the newly created NHS were a significant factor in the rise of concerns regarding the cost of health care. As the above paragraphs have shown, the debate on health expenditure in the early years of the NHS

was both triggered and framed by the health estimates compiled by the Ministry of Health. Concerns about the cost of health care first emerged in direct response to the supplementary estimate to the 1948–1949 NHS budget and intensified with the publication of subsequent estimates. Thus, the creation of these health estimates gave visibility to the hitherto unknown and invisible cost of health care to the nation (e.g. Miller & O'Leary, 1987).

Whilst the perceived increases in health-care costs, alongside the nationalization of the health services and the systematic measurement of health expenditure, had constituted the cost of health care as a problem, it was not yet an insoluble problem. Indeed, proponents of social medicine suggested that the higher than expected levels of health expenditure supported rather than contradicted their theories on the cost of health care. They argued that the overspends were caused by a greater than expected backlog of untreated disease and therefore represented evidence not for 'the extravagance of the new organisation but the deficiencies of the old' ('A question of cost,' 1949, p. 312). Whilst clearing this backlog was expensive, higher health expenditure would only be temporary and result in a more productive workforce. The cost of health care was a short-term cash-flow issue.

The Expansion of Medicine, Aging Populations and Negative Health

The cost of health care only became a fundamental socioeconomic problem when social medicine and associated notions of economically beneficial health expenditure started to be questioned and biomedical notions of health and disease re-emerged. At the heart of this development was Roberts (1949, 1952), a radiologist, whose contributions were widely reflected in debates on the cost of health care during the early years of the NHS (e.g. Abel-Smith & Titmuss, 1956; 'Economics and doctors,' 1952; Ministry of Health, 1956; 'The estimates,' 1954). Roberts (1949) suggested that the proponents of economically beneficial notions of health expenditure had not considered the 'effect of the ageing of the population', the 'intrinsically expansile nature' of scientific medicine and their mutual interactions (p. 293). Specifically, he argued that scientific medicine would become better at curing the acute diseases suffered mainly by the young, only for them to join the ranks of the old who suffered from chronic and degenerative diseases that could be treated but never cured. On this basis, Roberts (1952) argued that 'the further medicine advances, the greater the amount of work which it makes for itself' (p. 93) and concluded that the problem of health expenditure was 'by its very nature, insoluble' (p. 193).

According to Roberts (1949, 1952), the apparent misjudgment of the cost of health care by proponents of economically beneficial notions of health expenditure reflected misconceptions about the nature of health and illness. He denounced social medicine and sociomedical notions of health and disease as 'wishful thinking and idealistic dreaming' (Roberts, 1952, p. 24) before offering his own reflections on the issue. These displayed a strong focus on the biomedical mechanics of the body and a fascination with death and disease characteristic of what the proponents of social medicine had labeled 'negative health' a decade earlier. Roberts defined health 'as the individual's capacity, innate or acquired, to resist disease or death' (1952, p. 219) and emphasized the 'inherent [...] physical infirmities' and 'mortal nature' of human beings (1949, p. 295). Under the biomedical model of health and illness propagated by Roberts, disease and thus health expenditure, were inevitable.

Departmental Costing

The creation of the NHS and the publication of S.I. 1414 did not spark interest in hospital accounting beyond the usual suspects (e.g. 'Hospital accounting,' 1948). This changed

dramatically in 1949, when the first large supplementary estimate for the NHS was approved in Parliament and when Roberts (1949) first voiced his ideas regarding health expenditure. As the cost of health care emerged as a matter of considerable concern, hospital costing promised to supply a means to control health expenditure. In a series of leading articles, *The Accountant* ('Hospital cost accounting,' 1950, 1952a, 1952b; 'Hospital costing in Scotland,' 1951) repeatedly emphasized the 'urgent need for effective control of hospital finance' ('Hospital cost accounting,' 1952a, p. 178) and pointed to departmental costing as a 'means for checking this enormous expenditure' ('Hospital cost accounting,' 1950, p. 258). *The Hospital* ('Hospital costing accounting,' 1952) similarly called for the introduction of a departmental costing system.

As the cost of the health service emerged as the dominant health policy issue (Abel-Smith & Titmuss, 1956), interest in hospital costing extended into fields that hitherto had paid little attention to accounting. In 1949, Britain's leading medical journals began publishing articles about costing, often with considerable technical detail (e.g. Mohun, 1953; Stone, 1949). Both the *British Medical Journal* ('Hospital cost accounting,' 1952) and *The Lancet* ('Control of hospital expenditure,' 1951) supported hospital costing reform.

Amid concerns that the NHS was 'heading for the bankruptcy court' ('A failing policy,' 1950, p. 1262) and widespread calls for hospital accounting reform, the Ministry of Health commissioned four reports to investigate hospital costing (King's Fund, 1952; Ministry of Health, 1955; Nuffield Trust, 1952; Regional Hospital Board Treasurers, 1952). All four reports recommended the adoption of a departmental costing system, which was introduced in April 1957. This system focused on technical efficiency and sought to encourage hospitals to produce various services at the lowest possible cost. It did not concern itself with the allocative efficiency of health service outputs and therefore did not encourage hospitals to maximize the health benefits of scarce health service funds. A strong focus on technical efficiency and disregard for the allocative efficiency of health service outputs became a feature of all hospital costing systems adopted by the NHS since the 1950s, including the current DRG-inspired costing approach (e.g. Department of Health, 2002; Department of Health and Social Security, 1983; Perrin, 1978).

Thus, whilst managerial accounting practices were of interest only to a small number of hospital costing enthusiasts in the inter-war period, the emergence of concerns regarding the cost of health care moved them to the front of the agenda in the years after 1949. Against the background of a state-funded health service, worries about aging populations and a series of health estimates that highlighted the cost of health care to the nation, the introduction of a departmental costing system focused on increasing the technical efficiency of hospitals became a national priority.

The Guillebaud Report

At the height of the cost crisis in the early 1950s, the Ministry of Health commissioned an investigation into the cost of the NHS led by Claude Guillebaud. The investigation's report, published in 1956, showed that the net cost of the NHS had increased from £327.8m in 1948–1949 to £430.3m in 1953–1954 (Ministry of Health, 1956). Yet, adjusted for inflation, the net cost had only increased from £327.8m to £380.8m (in 1948–1949 prices). As a percentage of national income, it had declined from 3.51% to 3.24% during this timeframe. The report suggested that concerns regarding the cost of the NHS had been caused by general (rather than health-service specific) inflation and a backlog of previously untreated disease. It supported Roberts (1949, 1952) suggestions regarding the cost effects of medical technologies but rejected his ideas regarding the cost implications of aging populations. The report concluded that the

NHS was a 'wealth producing as well as a health producing service' (Ministry of Health, 1956, p. 50).

The publication of the Guillebaud Report marked the end of the cost crisis. Concerns regarding the effects of medical science and aging populations on health expenditure had been allayed, if only temporarily.¹⁰ Interest in hospital accounting again became limited to a small number of enthusiasts. The departmental costing system, introduced in 1957, was enthusiastically welcomed by *The Accountant* ('Official hospital costing system,' 1957) but received little attention in medical journals beyond a short note in *The Lancet*, which suggested that the 'comparison of [cost] figures between different hospitals does not seem to be particularly rewarding' ('Hospital cost returns,' 1958, p. 1319). Recent studies by Gebreiter (2016) and Robson (2003) indicate that the departmental costing system had no significant effects on the work of administrators or doctors in the NHS.

Conclusions and Implications

In the present study, we have developed a genealogy of concerns regarding the cost of health care in Britain and their relationship with health service accounting practices. This genealogy has shown that current concerns about health expenditure are not inescapable consequences of aging populations and technological advances but are instead historically contingent. Specifically, it has demonstrated that such concerns first emerged in the mid-twentieth century in response to the nationalization of the health services, the compilation of health estimates and the renaissance of biomedical notions of health and disease.

The genealogy has also shown that accounting was both reflective and constitutive of concerns regarding health expenditure (e.g. Hopwood, 1987, 1992). It has, in particular, highlighted the constitutive role of the health estimates compiled by the Ministry of Health, which gave visibility to the hitherto unknown cost of health care to the nation (e.g. Miller & O'Leary, 1987). Their publication from the financial year 1948–1949 onwards transformed health policy debates in Britain, marginalizing issues like the equity and effectiveness of health services as health expenditure, cost control and the technical efficiency of hospitals came to dominate public debate on the newly created NHS. These findings are of particular interest for two reasons. Firstly, they confound the generally accepted assumption that, prior to the emergence of NPM in the 1980s, accounting did not constitute or shape but only described and documented the activities of public sector organizations (e.g. Hopwood, 1984). Secondly, our findings build on the work of Napier (2006) and Suzuki (2003) by highlighting that the constitutive role of accounting is not restricted to the organizational or 'micro-managerial' level, and by showing that the transformative power of macro-accounting practices extends into social domains like the health services.

¹⁰Although Guillebaud had endorsed many social medicine positions regarding health care and its costs, this discipline declined terminally in the 1950s. The biomedical model, perhaps more attuned to the focus on individualism in Western societies, to the belief in 'hard' science and to the interests of the medical profession, dominated health policy in the second half of the twentieth century (Porter, 2006). Huge sums were invested in hospital building and biomedical research programs, specialties multiplied, and medical practice became increasingly narrow and technological. Normal biological processes like pregnancy or aging became increasingly medicalized (Illich, 1975). Preventive medicine, meanwhile, was starved of both funds and prestige. In parallel to these developments, state involvement in funding and delivering health services increased across the developed world in the second half of the twentieth century. As in the British case described above, greater state involvement in the health services was frequently accompanied by efforts to account for health expenditure, both at national and international levels (e.g. Organization of Economic Co-operation and Development, 2000). Against this background, concerns regarding the cost of health care, the expansion of medicine and aging populations re-emerged in the 1970s, as did calls for the introduction of managerial hospital accounting practices.

The genealogy developed in this paper has potential implications for the role of accounting in current attempts to control costs in the health services. It is noteworthy that in the context of a centralized, state-funded service the simple accounting and budgeting arrangements mandated by S.I. 1414 (Ministry of Health, 1948) helped to establish control over the cost of the NHS. Following overspends in the first two years after the creation of the NHS (mainly caused by general inflation and a backlog of untreated disease), they helped to reduce its cost from 3.71% to 3.24% of GDP between 1950–1951 and 1953–1954 (Ministry of Health, 1956).

This seemingly successful use of accounting to contain health expenditure contrasts with accounts of its use in more decentralized health-care systems, where hospitals act as autonomous units and have access to a wide range of public and private funding sources (e.g. Eldenburg & Soderstrom, 1996; Gorsky et al., 2002; Steinbusch, Oostenbrink, Zuurbier, & Schaepekens, 2007). In these circumstances, there appears to be a strong temptation amongst hospitals to use accounting practices in a strategic manner, that is, to increase revenues rather than to control costs or improve efficiency (Cardinaels & Soderstrom, 2013). Such behaviors could historically be observed in pre-NHS hospitals, where financial statements were often prepared in a manner that exaggerated deficits to elicit charitable contributions (e.g. Gorsky et al., 2002; Jones & Mellett, 2007), and currently in the context of DRG-based prospective payment systems, where hospitals engage in practices such as cost-shifting, miscoding and upcoding to increase their revenues (e.g. Eldenburg & Kallapur, 1997; Eldenburg & Soderstrom, 1996; Soderstrom, 1993; Steinbusch et al., 2007). Thus, it would appear that in highly centralized health systems that rely on a single funding source and do not closely link hospital funding allocations with reported activity measures, accounting was used to control costs. Conversely, more decentralized systems, in which autonomous health-care providers draw on a wider range of funding sources, seem to provide both greater scope and incentives for the strategic use of hospital accounting practices.

Of course, the combination of a fully state-funded health service and simple accounting and budgeting mechanisms, such as the ones set out by S.I. 1414, offers few explicit incentives to increase the efficiency of health services. Yet, against the background of reforms promoting the decentralization of health services in Britain and beyond that are justified with reference to concerns regarding health expenditure (e.g. Prime Minister's Office, 2011), it should be noted that such reforms could decrease rather than increase accounting's ability to facilitate cost control.

The findings of this genealogical study also have potential implications for current attempts to increase efficiency in the health services. Like in the 1950s, when worries regarding aging populations and the expansion of medical science led to the introduction of a departmental costing system focused on technical efficiency, twenty-first-century concerns regarding health expenditure have similarly concentrated much health policy and hospital accounting discourse on increasing the technical efficiency of health service providers (e.g. Chang, Chang, Das, & Li, 2004). Prospective payment systems based on DRGs (or similar patient classifications) have been the focus of such attempts, as they seek to incentivize hospitals to treat patients suffering from various diseases at the lowest possible cost. The extent to which this has been successful is the subject of much accounting research (e.g. Borden, 1988; Eldenburg & Kallapur, 2000).

This strong emphasis on technical efficiency has not been matched by a similar focus on allocative efficiency. Whereas a small number of recent hospital accounting studies have started to explore issues relating to the allocative efficiency of inputs (e.g. Holzhacker, Krishnan, & Mahlendorf, 2015; Hsu & Qu, 2012), the relationship between hospital accounting practices and the allocative efficiency of health service outputs has not been a focus of the accounting literature. Amidst emerging suggestions that health systems like the NHS cannot remain financially viable unless they focus scarce resources on those services that provide the greatest health benefits

relative to their costs (e.g. Health Foundation, 2015), we conclude by calling upon accounting researchers to engage more closely with the issue of allocative efficiency in the health services.

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References

- Abel-Smith, B., & Titmuss, R. (1956). *The cost of the National Health Service in England and Wales*. Cambridge: Cambridge University Press.
- A failing policy. (1950). *British Medical Journal*, 2, 1262–1263.
- A question of cost. (1949). *The Lancet*, 253, 312.
- Assheton, R. (1949). Medical notes in Parliament. *British Medical Journal*, 1, 372–374.
- Beveridge, W. (1942). *Social insurance and allied services*. London: HMSO.
- Borden, J. (1988). An assessment of the impact of diagnosis-related group (DRG)-based reimbursement on the technical efficiency of New Jersey hospitals using data envelopment analysis. *Journal of Accounting and Public Policy*, 7(2), 77–96.
- Bourn, M., & Ezzamel, M. (1986). Organisational culture in hospitals in the National Health Service. *Financial Accountability and Management*, 2(3), 203–225.
- Burdett, H. (1893). *The uniform system of accounts*. London: The Scientific Press.
- Buzzard, F. (1942). The place of social medicine in the reorganization of the health services. *British Medical Journal*, 1, 703–704.
- Cardinaels, E., & Soderstrom, N. (2013). Managing in a complex world: Accounting and governance choices in hospitals. *European Accounting Review*, 22(4), 647–684.
- Chang, H., Chang, W., Das, S., & Li, S. (2004). Health care regulation and operating efficiency of hospitals: Evidence from Taiwan. *Journal of Accounting and Public Policy*, 23(6), 483–510.
- Chapman, C., Kern, A., & Laguecir, A. (2014). Costing practices in health care. *Accounting Horizons*, 28(2), 353–364.
- Chua, W. (1995). Experts, networks and inscriptions in the fabrication of accounting images: A story of the representation of three public hospitals. *Accounting, Organizations and Society*, 20(2), 111–145.
- Control of hospital expenditure. (1951). *The Lancet*, 258, 395–397.
- Cost of the health services. (1948). *British Medical Journal*, 1, 532.
- Cost of the NHS. (1950). *British Medical Journal*, 1, 656.
- Costs and policy. (1949). *The Hospital*, 45, 111–113.
- Cripps, S. (1950). Medical notes in Parliament. *British Medical Journal*, 1, 734–739.
- Cutler, T. (2000). *The cost of the National Health Service: Problem definition and policy response 1942–1960*. Unpublished PhD thesis. University of London.
- Department of Health. (2002). *Payment by results*. London: HMSO.
- Department of Health and Social Security. (1983). *NHS management inquiry*. London: HMSO.
- Eckstein, H. (1958). *The English health service*. Cambridge, MA: Harvard University Press.
- Economics and doctors. (1952). *British Medical Journal*, 1, 642–643.
- Economist Intelligence Unit. (2011). *The future of healthcare in Europe*. London: Author.
- Eldenburg, L., & Kallapur, S. (1997). Changes in hospital service mix and cost allocations in response to changes in Medicare reimbursement schemes. *Journal of Accounting and Economics*, 23(1), 31–51.
- Eldenburg, L., & Kallapur, S. (2000). The effects of changes in cost allocations on the assessment of cost containment regulation in hospitals. *Journal of Accounting and Public Policy*, 19(1), 97–112.
- Eldenburg, L., & Soderstrom, N. (1996). Accounting system management by hospitals operating in a changing regulatory environment. *The Accounting Review*, 71(1), 23–42.
- Foucault, M. (1977). *Discipline and punish*. London: Allen Lane.
- Foucault, M. (1991). Questions on method. In G. Burchell, C. Gordon, & P. Miller (Eds.), *The Foucault effect: Studies in governmentality* (pp. 73–86). Chicago, IL: University of Chicago Press.
- Fries, J. (1989). The compression of morbidity: Near or far. *Millbank Quarterly*, 67(2), 208–232.
- Gebreiter, F. (2016). 'Comparing the incomparable': Hospital costing and the art of medicine in post-war Britain. *British Accounting Review*, 48(2), 257–268.

- Gebreiter, F. (in press). Accounting and the emergence of care pathways in the National Health Service. *Financial Accountability and Management*.
- Gorsky, M., Mohan, J., & Powell, M. (2002). The financial health of voluntary hospitals in interwar Britain. *Economic History Review*, 55(3), 533–557.
- Health Foundation. (2015). *Hospital finances and productivity: In a critical condition?* London: Author.
- Health service costs. (1953). *British Medical Journal*, 1, 723–724.
- Holzhaecker, M., Krishnan, R., & Mahlendorf, M. (2015). The impact of changes in regulation on cost behavior. *Contemporary Accounting Research*, 32(2), 534–566.
- Hopwood, A. (1984). Accounting and the pursuit of efficiency. In A. Hopwood & C. Tomkins (Eds.), *Issues in public sector accounting* (pp. 167–187). Deddington: Philip Allan.
- Hopwood, A. (1987). The archaeology of accounting systems. *Accounting, Organizations and Society*, 12(3), 207–234.
- Hopwood, A. (1992). Accounting calculation and the shifting sphere of the economic. *European Accounting Review*, 1(1), 125–143.
- Hospital accounting. (1948). *The Accountant*, 119, 101–102.
- Hospital accounts. (1946). *The Accountant*, 115, 77–79.
- Hospital cost accounting. (1950). *The Accountant*, 122, 257–258.
- Hospital cost accounting. (1952). *British Medical Journal*, 2, 1247–1249.
- Hospital cost accounting. (1952a). *The Accountant*, 127, 177–178.
- Hospital cost accounting. (1952b). *The Accountant*, 127, 661–663.
- Hospital costing. (1952). *The Hospital*, 48, 483–486.
- Hospital costing in Scotland. (1951). *The Accountant*, 124, 154.
- Hospital cost returns. (1958). *The Lancet*, 272, 1319–1320.
- Hospital finance. (1950). *The Lancet*, 255, 499–500.
- Hsu, S., & Qu, S. (2012). Strategic cost management and institutional change in hospitals. *European Accounting Review*, 21(3), 499–531.
- Illich, I. (1975). *Medical nemesis: The expropriation of health*. London: Calder and Boyars.
- Jameson, W. (1943). Positive health. *The Hospital*, 39, 141–142.
- Jeacle, I. (2014). Fast fashion: Calculative technologies and the governance of everyday dress. *European Accounting Review*, 24(2), 305–238.
- Jones, M., & Mellett, H. (2007). Determinants of changes in accounting practices: Accounting and the UK health service. *Critical Perspectives on Accounting*, 18(1), 91–121.
- King's Fund. (1952). *Report on costing investigation for the Ministry of Health*. London: Author.
- Kurunmaki, L. (2004). A hybrid profession – the acquisition of management accounting expertise by medical professionals. *Accounting, Organizations and Society*, 29(3), 327–347.
- Kurunmaki, L., Lapsley, I., & Melia, K. (2006). *Cost, care and rationing: A comparative study of intensive care in the UK and Finland*. London: CIMA.
- Lapsley, I. (2001). Accounting, modernity and health care policy. *Financial Accountability and Management*, 17(4), 331–350.
- Llewellyn, S., & Northcott, D. (2005). The average hospital. *Accounting, Organizations and Society*, 30(6), 555–583.
- Lowe, A., & Doolin, B. (1999). Casemix accounting systems: New spaces for action. *Management Accounting Research*, 10(3), 181–201.
- Maberly, A. (1943). The cult of negative health. *British Medical Journal*, 2, 55–56.
- MacKeown, T. (1942). Voluntary hospital revenue. *The Hospital*, 38, 57–58.
- Maslow, H. (1939). The background of the Wagner National Health Bill. *Law and Contemporary Problems*, 6(4), 606–618.
- Miller, P. (1998). The margins of accounting. *European Accounting Review*, 7(4), 605–621.
- Miller, P., & Napier, C. (1993). Genealogies of calculation. *Accounting, Organizations and Society*, 18(7/8), 631–647.
- Miller, P., & O'Leary, T. (1987). Accounting and the construction of the governable person. *Accounting, Organizations and Society*, 12(3), 235–265.
- Miller, P., & Rose, N. (2008). *Governing the present*. Cambridge: Polity Press.
- Ministry of Health. (1944). *A national health service*. London: HMSO.
- Ministry of Health. (1946). *National Health Service Bill*. London: HMSO.
- Ministry of Health. (1948). *Statutory Instrument 1414*. London: HMSO.
- Ministry of Health. (1955). *Report of the working party set up to devise a system of costing the departments and services of a hospital*. London: HMSO.
- Ministry of Health. (1956). *Report of the committee of the enquiry into the cost of the National Health Service*. London: HMSO.
- Mohun, A. (1953). Hospital costing: Its importance to the doctor. *The Lancet*, 261, 990–992.

- Napier, C. (2006). Accounts of change: 30 years of historical accounting research. *Accounting, Organizations and Society*, 31(4/5), 445–507.
- Nuffield Trust. (1952). *Report of an experiment in hospital costing*. Oxford: University Press.
- Official hospital costing system. (1957). *The Accountant*, 136, 347.
- Organization of Economic Co-operation and Development. (2000). *A system of health accounts*. Paris: Author.
- Perrin, J. (1978). *Management of financial resources in the National Health Service*. London: HMSO.
- Political and Economic Planning. (1937). *Report on the British health services*. London: Author.
- Porter, D. (2006). How did social medicine evolve, and where is it heading? *Plos Medicine*, 3(10), 1667–1672.
- Porter, R. (1999). *The greatest benefit to mankind*. London: Harper Collins.
- Prime Minister's Office. (2011). *Working together for a stronger NHS*. London: Author.
- Regional Hospital Board Treasurers. (1952). *Hospital cost accounting*. London: Committee of Regional Hospital Board Treasurers.
- Roberts, F. (1949). The cost of the National Health Service. *British Medical Journal*, 1, 293–297.
- Roberts, F. (1952). *The cost of health*. London: Turnstile Press.
- Robson, N. (2003). From voluntary to state control and the emergence of the department in UK hospital accounting. *Accounting, Business and Financial History*, 13(2), 99–123.
- Ryle, J. (1942). The science of health. *British Medical Journal*, 2, 745–748.
- Sargiacomo, M. (2008). Accounting and the art of government: Margaret of Austria in Abruzzo (1539–86). *European Accounting Review*, 17(4), 667–695.
- Soderstrom, N. (1993). Hospital behavior under Medicare incentives. *Journal of Accounting and Public Policy*, 12(1), 155–185.
- Soderstrom, N., Eldenburg, L., & Ernst, C. (2006). Investigating accounting issues and incentives in a DRG-setting. *Betriebswirtschaftliche Forschung und Praxis*, 58(6), 618–636.
- Steinbusch, P., Oostenbrink, J., Zuurbier, J., & Schaepekens, F. (2007). The risk of upcoding in casemix systems: A comparative study. *Health Policy*, 81(2/3), 289–299.
- Stone, J. (1936). *Hospital accounts and financial administration*. London: Faber and Faber.
- Stone, J. (1949). Costing for hospitals. *The Lancet*, 254, 212–213.
- Street, A., O'Reilly, J., Ward, P., & Mason, A. (2011). DRG-based hospital payment and efficiency. In R. Busse, A. Geissler, W. Quentin, & M. Wiley (Eds.), *Diagnosis-related groups in Europe* (pp. 93–114). Maidenhead: Open University Press.
- Suzuki, T. (2003). The accounting figuration of business statistics as a foundation for the spread of economic ideas. *Accounting, Organizations and Society*, 28(1), 65–95.
- The estimates. (1954). *British Medical Journal*, 1, 864.
- The health service estimates. (1953). *British Medical Journal*, 1, 716–717.
- Timmins, N. (2008). *Rejuvenate or retire: views of the NHS at 60*. London: Nuffield Trust.
- Walker, S. (2010). Child accounting and the 'handling of the human soul'. *Accounting, Organizations and Society*, 35(6), 628–657.
- Weisbrod, B. (1991). The health care quadrilemma: An essay on technological change, insurance, quality of care and cost containment. *Journal of Economic Literature*, 29(2), 523–552.
- World Health Organization. (2015). *World health statistics 2015*. Geneva: Author.
- Zweifel, P., Felder, S., & Meiers, M. (1999). Ageing of population and health care expenditure: A red herring? *Health Economics*, 8(6), 485–496.