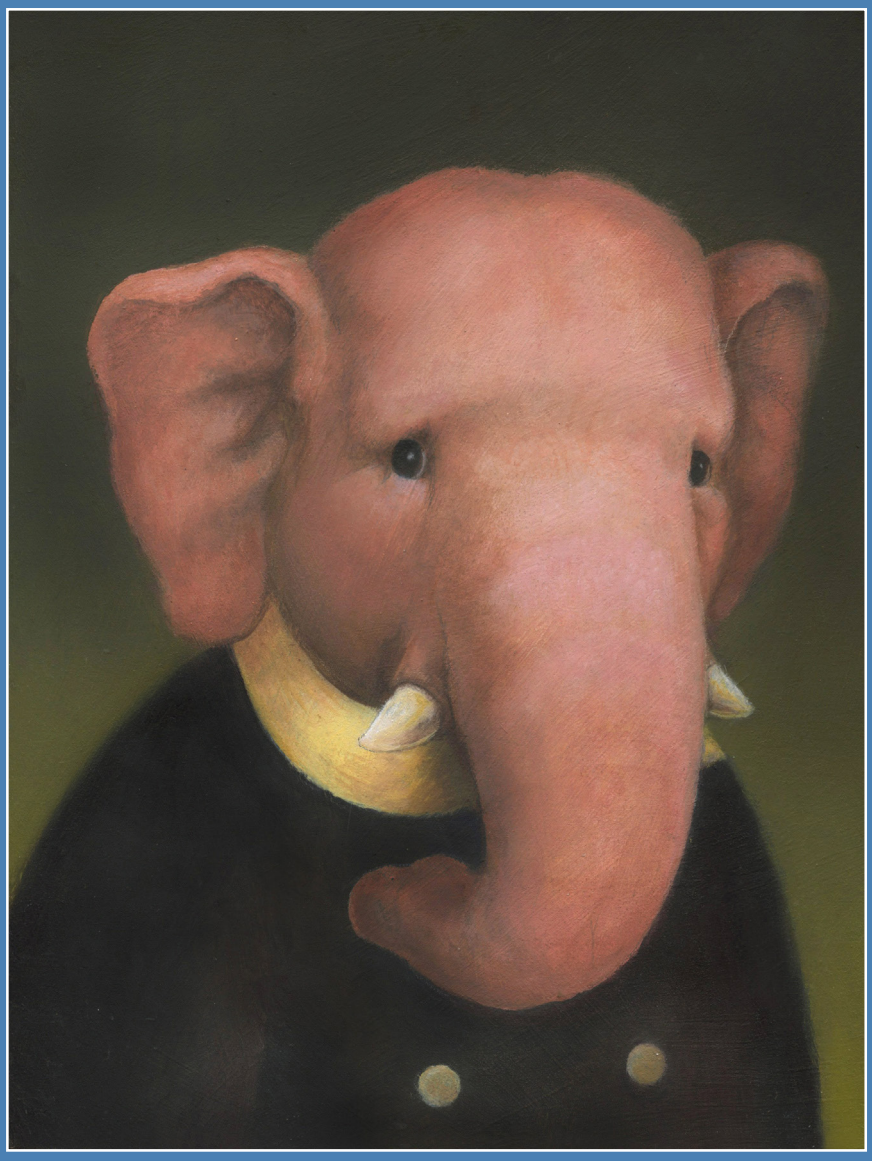
A Closer Look at the Governance of Academic Medical Centres

An Elephant by the Tail



Ester M.M. Cardinaal

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A Closer Look at the Governance of Academic Medical Centres

An Elephant by the Tail

Ester Maria Margaretha Cardinaal

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An Elephant by the Tail

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A Closer Look at the Governance of Academic Medical Centres

An Elephant by the Tail

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A Closer Look at the Governance of Academic Medical Centres

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Dissertation to obtain the degree of doctor
from Radboud University Nijmegen
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according to the decision of the Doctorate Board
to be defended in public on

Monday, June 24, 2024
at 12.30 pm

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Who will conquer all?

She, queen of the kings, running so fast, beating the wind
Nothing in this world can stop the spread of her wings

She, queen of the kings, broken her cage, threw out the keys
She will be the warrior of the North and Southern Seas

Alessandra Mele (2023)

PROLOGUE

Looking at the cover of my dissertation, you may have wondered what on earth an elephant has to do with the governance of academic medical centres. And let's not even talk about the tail.....

On 11 July 2014, the Dutch Minister of Health and Welfare and the Minister of Sport and Education, Culture and Science wrote a 'positioning policy paper on university medical centres' (Positioneringsnota umc's). Although not described in so many words, this note seems to contain some critical questions about the right to exist of academic medical centres (AMCs). My assumption was that this was definitely of some importance to the AMCs and that the management would definitely do something about it. My attention was caught. In the years that followed, I continued to be puzzled by what I considered to be a "deafening silence" when it came to the actions taken by the top-level executives of the AMCs to highlight their distinctive character. If there was any action, it went unnoticed by me. At the time, this was not so strange; after all, I had only worked in a university medical centre for a very short time. But it continued to fascinate me, especially as public debate and opinion magazines became increasingly critical of the number of AMCs in the Netherlands.

In 2018, while sitting at a table in the Radboudumc restaurant with a good friend, the idea of doing research to satisfy my desire to develop myself intellectually was born. The topic of my research was immediately clear, looking back at the fascination that had not left me since 2014: the governance of academic medical centres. At the beginning of my PhD project, I discovered that the governance of AMCs is complex and little has been written about it, yet AMCs are key organisations in the healthcare landscape. So it is a fantastic topic, there is really something to contribute to the improvement of healthcare by providing more insight.

Finally, the elephant and its tail. The subtitle of my dissertation is actually a combination of two phrases. "An elephant in the room" is a phrase used to say that something is very obvious, you can't miss it, but no one wants to be the one to point it out or talk about it. It is assumed that everyone has noticed it. I am referring to the discussion about the distinctiveness and competitive position of AMCs. A discussion that is rarely held in public.

“A tiger by the tail”, with the vivid image of catching a dangerous beast like a tiger with bare hands, means something too difficult to manage or cope with. This refers to the governance of AMCs, which are considered to be among the most complex organisations in the world, combining three different core missions with different business models converge in one organisation. For me, the contraction of these two phrases touches the core of my dissertation. The management of the AMC is organisationally complex because of the different core tasks and the cooperation with the university (the tail), and then there are factors that make the management of AMCs even more complex. Factors related to political and competitive sensitivities, which are not always openly discussed and therefore cannot be adequately addressed (the elephant).

Now that I have explained the tail and the elephant in the subtitle, I hope your mind is free to take a closer look at the governance of academic medical centres.

Enjoy!

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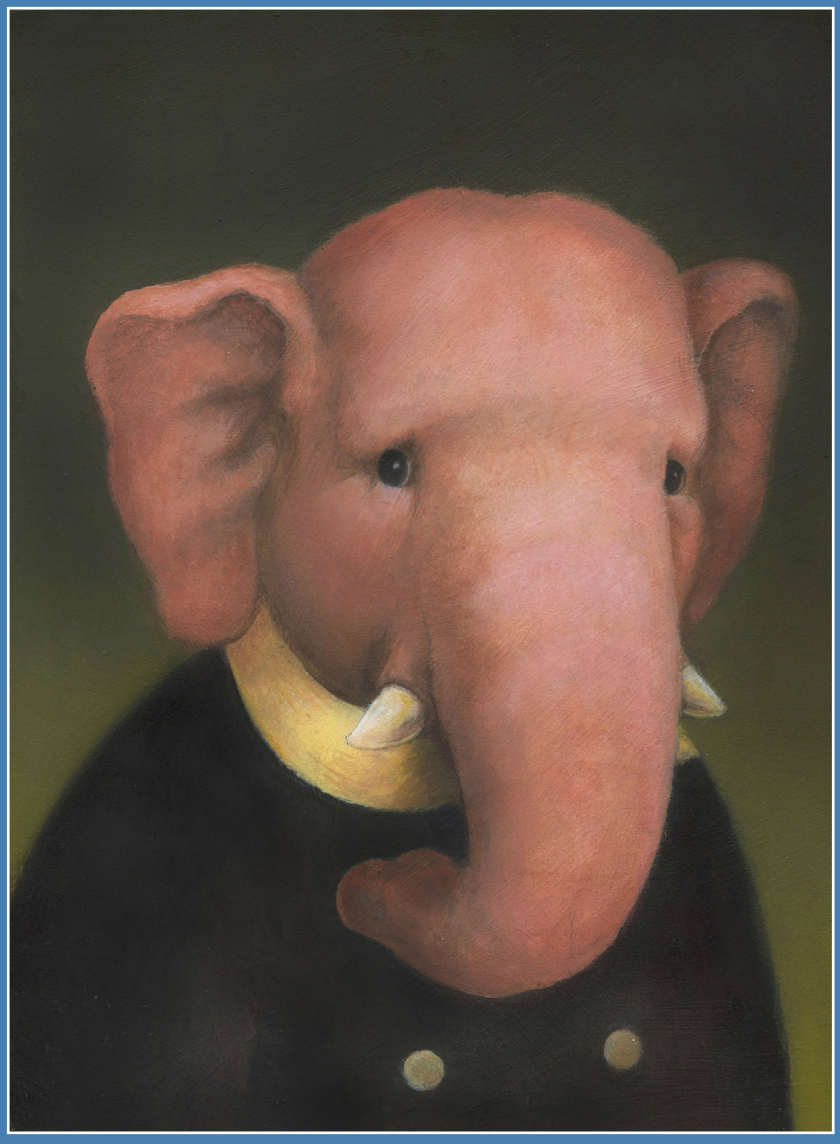


Chapter 1

General introduction

1.1 Aim of this dissertation

Academic medical centres (AMCs) are power centres within the health sector. However, rising healthcare costs, increasing labour shortages, a rapidly ageing patient population with multiple chronic conditions, massive inflation, the energy crisis and the aftermath of a pandemic are forcing even these powerhouses to rethink their position and strategy. The healthcare landscape is changing and healthcare organisations are facing a rapidly evolving environment - global talent shortages and fierce competition for healthcare professionals - as well as internal dynamics such as an ageing, multi-generational workforce and the changing nature of healthcare organisation and governance structures. These changes also affect AMCs, forcing them to be flexible and adapt to change. However, one of the greatest organisational challenges for AMCs and their leaders is the ability to respond effectively to change [1]. This study explored the complex organisation and governance of European AMCs in general and those in the Netherlands in particular, in order to fill a gap in the literature and provide insight and a better understanding of this topic. This chapter outlines the historical background, starting with developments in the United States (US), followed by Europe in general and, finally, the Netherlands in particular. The United States is chosen as the starting point, because North America can be seen as the cradle of the modern AMC, where patient care, research and teaching are combined in one organisation in close partnership with the university [2]. In the absence of a clear definition of an academic medical centre, terms such as university hospital, academic medical centre and teaching hospital are used interchangeably. For the sake of simplicity, these terms will be used in this dissertation to refer to a hospital that has a partnership with a university and provides (highly complex) patient care, research and teaching at the same time.

1.2 Historical background

1.2.1 The United States

Biomedical science developed rapidly in the USA at the end of the 19th and beginning of the 20th century, against the background of strong economic growth. Economic development influenced the way clinical and basic research was viewed. Abraham Flexner was a leading critic of medical education. He ran a progressive college preparatory school that he had founded. In 1908 he wrote a critical article on the American educational system [3]. This prompted the Carnegie Foundation to ask him to assess the quality of 155 medical schools in the US and Canada [4]. At that time, the

entry requirements for becoming a doctor were low. Training was largely theoretical. After his research, Flexner concluded that medicine should be based on science. All doctors had to be given the responsibility of conducting medical research and disseminating the knowledge they had acquired through their training. The quality of medical education had to be ensured by ensuring that all students had a university education. Flexner laid this out in his report for the Carnegie Foundation in 1910, better known as the now widely circulated Flexner Report [5]. This report can be seen as the blueprint for the current organisation of AMCs in the USA. The core of American AMCs was formed by bringing together patient care, research and education in one organisation in a cooperative relationship with a university.

Flexner's credo "ambulando discimus" ("we learn by going out") fits well with the topic of this dissertation. The aim of this dissertation is, firstly, to fill a gap in the literature in order to provide insights and a better understanding of the governance of European AMCs. Secondly, it examines two details of Dutch practice with the aim of sharing the knowledge gained and thereby contributing to improving the governance of AMCs in general.

1.2.2 Europe

Hospitals as we know them today did not emerge until the 18th century. The development of AMCs followed at the end of the 19th century, when research and education were added to patient care [6]. Just as economic growth influenced the formation of AMCs in the US, each country has experienced a certain socio-cultural development that has shaped healthcare in general and healthcare organisations in particular. Until about 1700, hospitals in Europe existed as refuges for the needy, which were intended for the care of poor people, mostly the chronically ill from the lower classes of society. After 1830, the number of hospitals in the USA and Europe increased significantly. This growth stabilises from 1930 as a result of adverse economic changes. After the Second World War, governments became increasingly involved in hospital care and in several countries they began to limit the growth of hospital spending in order to control rapidly rising costs. A period of concentration and mergers begins [6].

1.2.3 The Netherlands

Annet Mooij, in her book 'Doctors of Amsterdam', outlines very well the development in the Netherlands described in the previous paragraph [6]. People, mostly chronically ill, from the lower classes of society were cared for in so-called shelters. Wealthier patients who could afford it were cared for at home. Gradually, the shelters changed from environments for care to environments for treatment. Medical care outside the home became more and more accepted, so that even the wealthier patients began to seek care in these shelters. This development and growth eventually led to the establishment of the first private hospitals. Medical research was not yet linked to the shelters or the newly established private hospitals. In the 17th and 18th centuries, Dutch universities were primarily a place for academic education and theoretical training. Scientific research was still in its infancy and was carried out in laboratories outside the universities, often by people who pursued science as a hobby. This changed at the end of the 19th century when some of the first private hospitals gradually expanded patient care to include education and research. These progressive hospitals treated less fortunate patients free of charge in exchange for their participation in education and research. This is the precursor to an AMC-like organisation. The transformation of the shelters and several subsequent developments led to today's academic hospitals with complex organisation and governance, where patient care, teaching and research take place simultaneously. These developments naturally had an impact on the organisation and governance of what we now call in the Netherlands a "University Medical Centre (UMC)". Some key organisational developments in a nutshell: In the 18th and 19th centuries, hospitals were run by religious and civil servants who cared for the poor in public, municipal hospitals. These public hospitals coexisted with private not-for-profit hospitals run by religious orders. The public hospitals could be seen as the last safety net for the poor. Gradually, religious and civil servants gave way to medical professionals to run the hospitals. The 20th century saw an increase in supply and demand in the health sector and the need for more professional management. These developments necessitated different ways of managing and organising hospitals. After the Second World War, as hospitals grew and more emphasis was placed on business operations, managers with business and economic expertise entered hospital organisations. In the 1970s, the sharp increase in demand for hospital care and the need to control costs, also in relation to new technologies, made it necessary to regulate the whole health system. This had an impact on all hospitals and in particular on the establishment, organisation and

management of the Dutch UMCs. For example, the Act of 28 August 1969, amending the Scientific Education Act [7], made the UMCs independent legal entities. This law linked the teaching hospitals to the medical faculties for training and research, which gave the UMCs a special position in the Dutch hospital landscape. Although the cross-fertilisation of different goals and tasks within a UMC is conducive to the performance of its core tasks, it also involves complex organisation and governance. For example, in order to safeguard the relationship between the university and the hospital, in the Netherlands the position of the dean is embedded in both the UMC board and the university board.

1.2.4 AMCs today

In 150 years, shelters have evolved into institutions with complex governance and organisation [8, 9]. Today, AMCs are among the most complex organisations in the world. This is generally due to the size of the organisation, its place in the healthcare landscape and the different functions within one organisation [10, 11]. AMCs can be characterised as concentrations of power. This gives them a degree of immunity from the government and health insurers. This allows them to afford inefficiencies. However, healthcare is evolving globally. Both internal and external developments influence the governance and design of healthcare organisations, creating a need to critically examine their own functioning [12, 13]. Little research has been done in this area. This dissertation attempts to shed more light on how and in what context an AMC is organised, what the bottlenecks are and what future trends we can expect. The study covered the situation in the European health sector, with a special focus on the Netherlands.

Peter Drucker once said in an interview "Even small healthcare institutions are complex, barely manageable places... Large healthcare institutions may be the most complex organisations in human history" [14].

1.3 Research questions

1.3.1 Study 1 Scoping review

AMCs are now recognised as vital to the health and well-being of society as a whole through their core missions of patient care, research and education. However, very little is known about how these organisations go about achieving their three missions simultaneously [15, 16]. French et al. noted that the literature on AMCs is largely theoretical and heavily dominated by reports of individual case studies from North America [2]. To expand knowledge, the first study identified and analysed literature on

1) the relationship between the university/medical school and the academic medical centre;
2) the organisation of the board and the management body;
3) legal ownership.

These three elements were derived from Weiner's organisational theory [17]. Weiner created eight organisational models based on three dimensions: clinical enterprise organisation, academic-clinical enterprise integration, and authority position of the chief academic officer/medical dean. See section 1.3.1.1. for further explanation.

As the governance of AMCs is a relatively unexplored area of research, a scoping review was deemed appropriate to provide a broad overview of the available literature [18]. The study population was selected to represent a cross section of European countries. The Czech Republic, Germany, Latvia, the Netherlands, Poland, Spain, Sweden and the United Kingdom were included. There was little scientific literature available. A lot of grey literature was used.

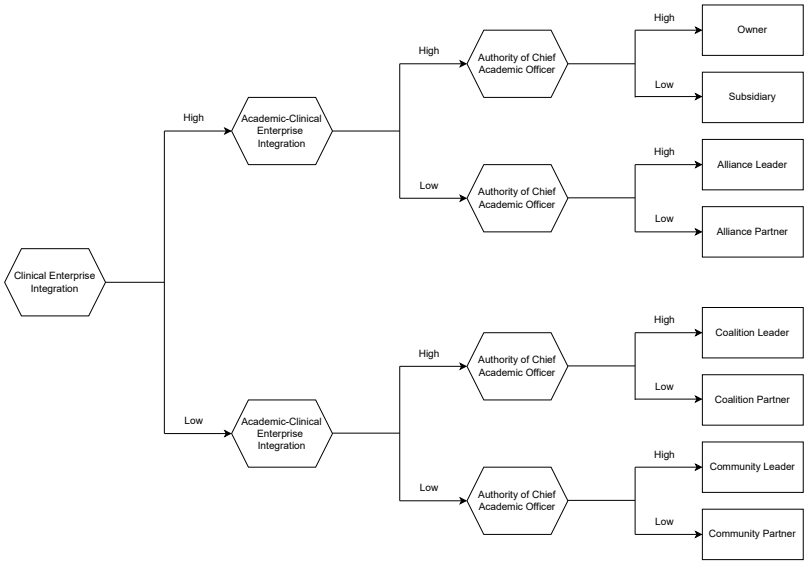
1.3.1.1 Weiner's organisational theory

The findings of the review were categorised using the organisational model theory of Weiner et al. [17]. Weiner found that AMCs and their leaders needed organisational models that could better respond to internal and external change. At the same time, he concluded that these organisations had little information about what organisational models were available, which ones might be appropriate and how to use them for academic purposes. Therefore Weiner created eight organisational models that AMCs could use to anticipate change by supporting and better understanding the

governance of an AMC. These eight models are based on three dimensions: 1) clinical enterprise organisation, 2) academic-clinical enterprise integration and 3) the authority position of the chief academic officer/medical dean. Figure 1 shows how the eight organisational models compare with the three dimensional framework that characterises the organisational relationship between the medical school and the AMC. These dimensions indicate the extent to which 1) the clinical enterprise resembles an 'organised delivery system,' 2) the medical faculty organises and integrates the clinical practice activities of its faculty with other parts of the clinical enterprise and 3) the authority of the chief academic officer over the clinical enterprise.

Most of the participants in this study characterise the Dutch UMCs as "subsidiairy" in the terminology of the Weiner model. This means that 1) there is a high degree of clinical enterprise organisation, a high degree of academic-clinical enterprise organisation and low academic authority over the clinical enterprise, 2) the medical faculty exercises relatively little power in the governance and management of the clinical enterprise, 3) the main role of the medical faculty is to support the broader mission of the clinical enterprise, and 4) the dean has no or limited authority to allocate financial and other resources to operational units or between the academic and clinical enterprise.

Figure 1 Diagram of eight ideal organisational models for medical school – clinical enterprise relationships. [17]



1.3.2 Study 2 European comparison

Prior to this dissertation, there had been no comparison of the governance of European AMCs. In order to better understand the governance of AMCs in Europe, the opinions, expectations, knowledge and experiences of experts in AMC governance were examined. More specifically the study examined

1) the definition of an AMC
2) the specific characteristics of an AMC;
3) the governance of an AMC; and,
4) future trends and challenges in AMC governance.

Due to a lack of literature, a qualitative study was conducted, using a questionnaire. Based on the results of the questionnaire and the review of the available literature, similarities, differences and future trends could be identified regarding the governance of AMCs. The design of the questionnaire was based on the aforementioned classification by Weiner et al. [17]. Ten countries were selected representing a cross section of Europe (Cyprus, Czech Republic, Denmark, Germany, Italy, Latvia, Netherlands, Norway, Poland and Spain), and Israel. Respondents to the questionnaire were purposively selected to provide a diverse and rich source of information and perspectives [19].

1.3.3 Study 3 Dutch AMC business models

As mentioned in section 1.2.4 of this chapter, the organisation and governance of AMCs is challenging for a number of reasons [12]. Weiner et al. found that AMC leaders are looking for new organisational models to adapt their operations to these changes. At the same time, however, he pointed out that AMC leaders have relatively little information about which organisational models might be suitable for supporting academic tasks and how these models should be applied [17]. Organisational structures and management models are often looked to for solutions to contemporary problems. Some academics are critical of these approaches and offer nuance. Culbertson et al. emphasise that no organisational model is superior to another. Instead, Culbertson suggests that the best choice of organisational model depends on history, local conditions and leadership [20]. Blumenthal et al. warned that not every academic centre has the same profile and therefore the generalisability of solutions in organisational models must be viewed with great caution [21]. Wietecha et al. attributed this to the complex organisational structure and the associated complex decision-making, characterised by different objectives

and distributed influence [8]. Some researchers develop criteria to help find the right model or system [22]. Others are critical and say that it is absolutely essential for each AMC to consider its governance structure and operational implementation in the context of its specific history, culture and environment [23]. Some believe that, regardless of the governance structure, the likelihood of success depends largely on the leadership of the directors and the strength of their relationships [23, 24].

AMCs constantly seek to adapt their activities, cooperation and, logically, their governance to changing circumstances. For AMCs and their leaders, it is a constant search for the most appropriate model for their organisation. It is far from clear for many AMC leaders how to anticipate the multitude of internal and external changes that are coming their way [17]. One of the challenges for European AMCs is their limited capacity to adapt to changing circumstances [1]. The adaptability of AMCs is hampered by the simultaneous implementation of different business models related to the performance of public functions in patient care, education and research [8]. One way in which the governance of an AMC can be adapted to changing circumstances is through the use of a business model. A business model is a model used to identify and manage different aspects of a business. These can include operational, organisational and financial aspects [25]. Duran et al. wonder why business models has not been developed, discussed and analysed in healthcare in general and in hospitals in particular [26]. DaSilva et al. conclude that managers should be able to adapt their business model effectively and in a timely manner when an opportunity or threat arises. They conclude that a business models is a means of managing an organisation [25]. Specifically for AMCs, Wietecha et al. [8] state that successful governance of complex organisations such as an AMC is possible through the simultaneous use of multiple business models. Taking the conclusions of the above authors together, the assumption can be made that the (simultaneous) use of one or more business models is potentially important for the governance of an AMC. This study did not identify a business model that accurately reflects the complexity of an AMC, but it aims to provide further insight into the management of an AMC through a business model. More specifically,

1) whether the concept of a business model is recognised, used and applied as such by managers; and
2) whether a business model is used as a tool to initiate change.

In the absence of information on a properly designed and analysed hospital business model [26], this study was designed as a quantitative case study [27]. Purposive sampling was used to include participants who could provide in-depth and detailed information about the use of business models in Dutch AMCs [19]. At least one respondent was included from each AMC. To be included, the respondent had to be involved in business operations or at least in the business side of an AMC.

1.3.4 Study 4 Dutch AMCs: Muddling through or radical change

In the 1970s, when new legislation on AMCs in the Netherlands was being discussed, there was a public debate about the role, place and function of these teaching hospitals and their relationship with universities [28-31]. This debate continues and AMCs are still regularly on the political agenda. Politicians have raised critical questions about the organisational effectiveness, the transparency and legitimacy of AMCs [32-35].

Although the Dutch AMCs have a relatively short history, they are already facing a situation where societal changes and public debate are forcing them to rethink their position (e.g. the number of AMCs) and profile (e.g. the distribution of care among them) [36]. The patient population is ageing, multimorbidity is increasing, the technological developments and staff shortages require a different approach to care. In addition, society expects AMCs to become more efficient. Successive Ministers have urged AMCs to sharpen their academic profile and clarify their positioning [32-34, 37-40]. At the same time, stakeholders such as healthcare insurers and other, non-academic hospitals, opinion leaders and politicians raise critical questions about the unique position of AMCs. For this reason, the government launched a 'Spending Review' (Interdepartementaal Beleids Onderzoek) in 2012 to investigate whether the method of financing and managing AMCs is efficient or whether adjustments are needed [41, 42]. In addition, the Topcare experiment was launched in 2013, whereby top referral care, research and education would be paid for in three non-academic hospitals during the period 2014-2018, demonstrating the social added value of this subsidy in nonacademic hospitals [43]. This led to the Minister’s decision that all non-academic hospitals wishing to strengthen specific health care functions could apply for additional funding. At the same time as the Topcare project, the AMCs and the Minister of Health started the 'ROBIJN' project (Rijks Overheids Bijdrage IJverig Nageplozen) [44]. The aim of this project is to develop a financing model for academic patient care. Subsequently, in

2014, the Ministers of Health and of Economic Affairs wrote a report in which they described the unique position that the AMCs occupy in the healthcare landscape. However, the Ministers felt that AMCs should make greater efforts to reach mutual agreements on the distribution and concentration of care [33]. And in 2019, the Minister of Health set the AMCs a task of change to increase their distinctiveness and efficiency and to ensure sustainability of healthcare spending [37]. The Minister continues to urge AMCs to critically examine their organisation with regard to the concentration of highly complex care in a small number of providers, the transfer of non-top referral care from the AMCs to general hospitals and the role of AMCs in establishing collaborations and networks [40].

Today, AMCs and their leaders continue to be under pressure. On the one hand, politicians wonder whether the AMCs are sufficiently different from other health care providers to receive financial resources that other health care providers are not entitled to. On the other hand, their mutual cooperation is being put to the test because the report 'The Right Care in the Right Place' (De Juiste Zorg op de Juiste Plek) calls for prevention of (more expensive) care, the substitution of care (closer to people's homes) and the replacement of care (by other care, such as e-health) [45]. The AMCs should focus on top referral care and make mutual agreements on the distribution of this top referral care. This trend will continue in the coming years. Demand for care is increasing and financial and human resources are scarce, so care has to be organised differently. A different organisation to ensure quality, accessibility and affordability of care. To address this, the ‘Integral Care Agreement’ (Integraal Zorgakkoord) requires all curative care providers to make agreements with each other on cooperation, concentration of care, strengthening primary care, prevention, value-based care, digitisation and labour market issues [46].

The situation in the Netherlands is not unique. Worldwide, the organisation of health care is under pressure due to the changing environment. This is particularly true for AMCs, which are faced with changing objectives and an increasingly complex financial environment in relation to the core tasks of highly complex patient care, research and education [13]. For more than 40 years, the unique position of AMCs has been questioned and they have been accused of a lack of transparent accountability [41]. In recent years, AMCs have been the subject of numerous parliamentary debates and Ministerial orders. However, little seems to have changed in the AMCs, and

these discussions and criticisms continue. In this research this is referred to as 'muddling through', a term introduced by Charles Lindblom. Lindblom later articulated this as incrementalism, referring to the decision-making process as a series of small, usually intuitive changes [47, 48]. As opposed to large, carefully planned changes, incrementalism is evolutionary rather than revolutionary. Today, incrementalism continues to influence current empirical research and theoretical debates [49]. In this fourth study is

1) hypothesized whether the current incrementalism in AMC governance is diminished by potential radical change, and
2) examined in which contexts these changes would be possible.

A thematic analysis, more specifically an inductive approach, was used to explore the opinions and experiences of high-level stakeholders regarding the governance of AMCs. The COREQ checklist was used as a guide for the study design. Tong et al. developed this checklist for explicit and complete reporting of qualitative studies, including in-depth interviews [50]. First, a literature review on the Dutch policy situation was conducted. Followed by unstructured interviews with expert stakeholders with integral knowledge of the management and policy of the Dutch healthcare landscape in general and the position of AMCs in particular [51, 52]. Unstructured interviews were chosen because structured interviews or questionnaires could inadvertently guide the interviewees [51, 53]. Participants were selected on the basis of purposive sampling [19]. The respondents in this study were selected and considered to be representative of the main strategic issues of AMCs. Respondents from different organisations, with different functions and different perspectives on the healthcare landscape were asked to participate in order to broaden the scope of this study.

Outline dissertation

AMCs are considered to be among the most complex organisations in the world. This complexity implies that these organisations struggle to adapt to changing circumstances. The central question of this dissertation concerned the organisation and governance of European AMCs in general and the Dutch AMC in particular, in order to fill a gap in the literature and provide insight and a better understanding of this topic.

Chapter 2 identifies and analyses the organisation and governance of a cross-section of European AMCs. Specifically, it examines the relationship between the university/medical school and the academic medical centre, the organisation of the board and management, the legal ownership structure and the presence and functioning of an umbrella organisation.

Chapter 3 compares the organisation and governance of European and Israeli AMCs and examines the definitions and characteristics of different European AMCs. Finally, it identifies trends and challenges in the governance of European AMCs.

Chapter 4 focuses on the use of business model potential in an AMC. As all AMC leaders face governance challenges related to a changing health care environment, the potential of business models to address these challenges was explored. More specifically, it explores whether a business model can be used as a tool for change.

Chapter 5 zooms in on the institutional complexities and equally complex governance challenges that encourage incrementalism or muddling through, on the assumption that radical change can offer a way out of incrementalism.

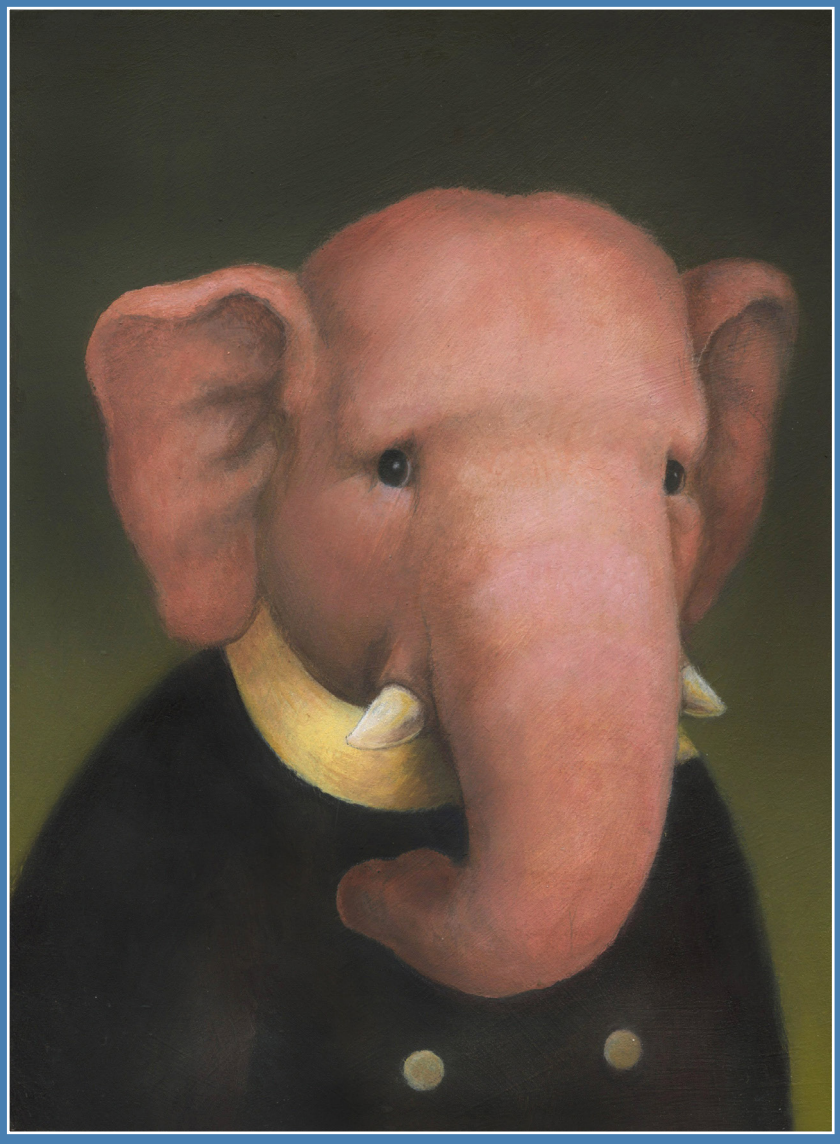
This dissertation concludes with a summary and general discussion in Chapter 6, with a reflection on the overall findings, the limitations of the study and suggestions for policy makers and top-level executives of AMCs. A Dutch summary of this dissertation is included in Chapter 7.

References

1. Cardinaal EMM, Duighuisen HNW, Jeurissen PPT, Berden H. Inventory and analysis of literature on the organisation of eight European academic medical centres-A scoping review. PLoS One. 2023;18(3):e0282856.
2. French CE, Ferlie E, Fulop NJ. The international spread of Academic Health Science Centres: a scoping review and the case of policy transfer to England. Health Policy. 2014;117(3):382-91.
3. Flexner A. The American college: a criticism / by Abraham Flexner. New York: Century; 1908.
4. The Carnegie Foundation. [Internet]. Available from: https://www.carnegiefoundation.org/about-us/. [Last accessed 2024-04-07].
5. Flexner A. Flexner Report. 1910.
6. Mooij A. Doctors of Amsterdam: Amsterdam University Press; 2002.
7. Wet op het Hoger onderwijs en Wetenschappelijk onderzoek . [Internet]. Available from: https://wetten.overheid.nl/BWBR0005682/2021-10-01. [Last accessed 2024-04-07].
8. Wietecha M, Lipstein SH, Rabkin MT. Governance of the academic health center: striking the balance between service and scholarship. Acad Med. 2009;84(2):170-6.
9. Wartman SA. The Transformation of Academic Health Centers: Meeting the Challenges of Healthcare's Changing Landscape. 2015.
10. Schreyogg J, von Reitzenstein C. Strategic groups and performance differences among academic medical centers. Health Care Manage Rev. 2008;33(3):225-33.
11. Becker BN, Formisano RA, Getto CJ. Commentary: dinosaurs fated for extinction? Health care delivery at academic health centers. Acad Med. 2010;85(5):759-62.
12. Cardinaal E, Dubas-Jakobczyk K, Behmane D, Bryndova L, Cascini F, Duighuisen H, et al. Governance of academic medical centres in changing healthcare systems: An international comparison. Health Policy. 2022.
13. McKee M, Merkur S, Edwards N, Nolte E, North J. The Changing Role of the Hospital in European Health Systems2020. 1-305 p.
14. Drucker PF. The post-capitalist executive. Interview by T George Harris. Harv Bus Rev. 1993;71(3):114-22.
15. Dzau VJ, Ackerly DC, Sutton-Wallace P, Merson MH, Williams RS, Krishnan KR, et al. The role of academic health science systems in the transformation of medicine. The Lancet. 2010;375(9718):949-53.
16. Dzau VJ, Cho A, Ellaissi W, Yoediono Z, Sangvai D, Shah B, et al. Transforming academic health centers for an uncertain future. N Engl J Med. 2013;369(11):991-3.
17. Weiner B, Culbertson R, Jones R, Dickler R. Organizational Models for Medical School—Clinical Enterprise Relationships. Academic medicine: journal of the Association of American Medical Colleges. 2001;76:113-24.
18. Munn Z, Peters MDJ, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. BMC Med Res Methodol. 2018;18(1):143.
19. Etikan I. Comparison of Convenience Sampling and Purposive Sampling. American Journal of Theoretical and Applied Statistics. 2016;5:1.
20. Culbertson RAR. Organizational models of medical school relationships to the clinical enterprise. Academic Medicine. 1996;71(11):1258-74.

21. Blumenthal D, Weissman JS, Griner PF. Academic health centers on the front lines: survival strategies in highly competitive markets. Acad Med. 1999;74(9):1038-49.
22. Chari R, O'Hanlon C, Chen P, Leuschner K, Nelson C. Governing Academic Medical Center Systems: Evaluating and Choosing Among Alternative Governance Approaches. Acad Med. 2018;93(2):192-8.
23. Guzick DS, Wilson DE. Governance of Academic Medical Centers Is Indeed a Complex and Unique Operation. Acad Med. 2018;93(2):154-6.
24. Hastings DA, Crispell KR. Policy-making and governance in academic health centers. J Med Educ. 1980;55(4):325-32.
25. DaSilva CM, Trkman P. Business Model: What It Is and What It Is Not. Long Range Plann. 2014;47(6):379-89-89.
26. Durán A, Wright S. Understanding Hospitals in Changing Health Systems2020.
27. Swanborn PG. Case studies - Wat, wanneer en hoe? Den Haag: Boom Lemma Uitgevers; 2013.
28. Jongkees LB. [Task, role and function of the academic hospital]. Ned Tijdschr Geneeskd. 1975;119(12):478-9.
29. Jongkees LB. [Once again academic hospitals]. Ned Tijdschr Geneeskd. 1975;119(17):678.
30. Jongkees LB. [Academic hospitals]. Ned Tijdschr Geneeskd. 1979;123(22):936.
31. Jonxis JHP. De toekomst van onze academische ziekenhuizen. NedTGeneesk. 1979;123(22):937-8.
32. Borst-Eilers, E., Minister van Volksgezondheid, Welzijn Sport en Onderwijs, Hermans, L.M.L.H.A., Minister van Onderwijs, Cultuur en Wetenschappen, Positionering academische ziekenhuizen (1998-11-02). [https://www.parlementairemonitor.nl/9353000/1/j9vvij5epmj1ey0/vi3ah7v3lezl].
33. Schippers E. Positioneringsnota UMCs (2014-07-11) [Internet]. Available from: https:// open.overheid.nl/documenten/ronl-archief-36d43656-fc9b-4073-9c20-dc3bdc308837/pdf .[Last accessed 2024-03-30].
34. Hoogervorst JF. Positionering academische ziekenhuizen (2006-12-20) [Internet]. Available from: https://zoek.officielebekendmakingen.nl/kst-26275-4.pdf. [Last accessed 24-03-30].
35. Bruins B. Maatschappelijke rol umc's (2019-07-19) [Internet]. Available from: https:// www.parlementairemonitor.nl/9353000/1/j4nvgs5kjg27kof_j9vvij5epmj1ey0/vl08ecbdptuv/f=/kst332788.pdf. [Last accessed 2024-03-30].
36. Jeurissen P, Duran A, Saltman RB. Uncomfortable realities: the challenge of creating real change in Europe's consolidating hospital sector. BMC Health Serv Res. 2016;16 Suppl 2:168.
37. Bruins, B. Interdepartementaal Beleids Onderzoek Maatschappelijke rol van umc's in het medisch zorglandschap (2019-07-12) [Internet]. Avaible from: https://zoek.officielebekendmakingen.nl/kst-33278-8.html [Last accessed 2024-03-30].
38. Bruins B. De publieke functies van de umc's in een marktomgeving (2005-11-20) [Internet]. Available from: https://www.parlementairemonitor.nl/9353000/1/ j9vvij5epmj1ey0/vi3aqf556izy [Last accessed 2024-03-30].
39. Ark T. Kamerbrief Stand van zaken umcs (2020-10-08) [Internet]. Available from: https:// open.overheid.nl/documenten/ronl-ad09db35-d1ab-4dfd-bb5e-2e058d1f4ca7/pdf. [Last accessed 2024-03-30]

40. Kuipers, EJ. Interdepartementaal Beleidsonderzoek: Universitair Medische Centra (UMC's). [Internet]. Available from: https://zoek.officielebekendmakingen.nl/kst-33278-12.html. [Last accessed 2024-04-05].
41. Schippers E. Interdepartementaal Beleidsonderzoek Universitair Medische Centra (UMC's) (2012-05-23)[Internet]. Available from: https://www.parlementairemonitor.nl/9353000/1/j9tvgajcovz8izf_j9vvij5epmj1ey0/vizxe96bffxk. [Last accessed 2024-03-30].
42. Nederlandse Zorgautoriteit. Monitor UMC's 2021. [Internet]. Available from: https:// www.rijksoverheid.nl/documenten/rapporten/2022/03/10/monitor-umcs-2021. [Last accessed 2024-03-30].
43. Postma JD, Dongen A, Hakkaart L, Bal R. Evaluatie Topzorg. Erasmus School of Health Policy and Management. 2018. [Internet]. Available from: https://www.eur.nl/sites/corporate/files/2019-01/Evaluatie%20TopZorg%20december%202018%20def.pdf. [Last accessed 2024-03-30].
44. Nederlandse Federatie van Universitair Medische Centra. ROBIJN. [Internet]. Available from: https://www.nfu.nl/themas/bestendig-zorgstelsel/robijn. [Last accessed 2024-03-30].
45. Ministerie van Volksgezondheid, Welzijn en Sport. Rapport Juiste Zorg op de Juiste Plek. 2018. [Internet]. Available from: https://open.overheid.nl/documenten/ronl-7241c365-d8f3-4eb0-befe-6de4dc088f60/pdf. [Last accessed 2024-03-30]
46. Kuipers EJ. Integraal Zorgakkoord: 'Samen werken aan gezonde zorg' 2022 [Internet]. Available from: https://www.rijksoverheid.nl/documenten/rapporten/2022/09/16/ integraal-zorgakkoord-samen-werken-aan-gezonde-zorg. [Last accessed 2024-03-30].Lindblom CE. The Science of Muddling Through. Public Admin Rev. 1959;19(2):79-88.
47. Lindblom CE. Still muddling, not yet through. Public Admin Rev. 1979;39(6):517-26.
48. Lindblom CE. The Science of Muddling Through. Public Admin Rev. 1959;19(2):79-88.
49. Rothmayr Allison C, Saint-Martin D. Half a century of “muddling”: Are we there yet? Policy and Society. 2011;30(1):1-8.
50. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349-57.
51. Zhang Y, Wildemuth B. Qualitative Analysis of Content. Applications of Social Research Methods to Questions in Information and Library Science. 2009.
52. Mueller A, Segal D. Structured versus Semistructured versus Unstructured Interviews. 2015.
53. Low J. Unstructured and Semi–Structured Interviews in Health Research. Researching Health: Qualitative, Quantitative and Mixed Methods. 2019:123-41.



Chapter 2

Inventory and analysis of literature on the organisation of eight European academic medical centres – A scoping review

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ABSTRACT

Academic Medical Centres (AMCs) are important organisations for shaping healthcare. The purpose of this scoping review is to understand the scope and type of evidence related to the organisation of European AMCs. The study population was selected intending to obtain a demographic cross-section of European countries: Czech Republic, Germany, Latvia, the Netherlands, Poland, Spain, Sweden and the UK. The search strategy focused on the relationship between medical schools and AMCs, the organisation of governing bodies, and legal ownership. The bibliographic databases of PubMed and Web of Science were searched (most recent search date 17-06-2022). Google search engines were used to search for relevant websites to enrich the search result. The search strategy yielded 4,672 records for consideration. After screening and reviewing full-text papers, 108 sources were included. The scoping review provided insight into the scope and type of evidence related to the organisation of European AMCs. Limited literature is available on the organisation of these AMCs. Information from national-level websites complemented the literature and provided a more complete picture of the organisation of European AMCs. Some meta-level similarities were found regarding the relationship between universities and AMCs, the role of the dean and the public ownership of the medical school and the AMC. In addition, several reasons were found why a particular organisational and ownership structure was chosen. There is no uniform model for AMC organisations (apart from some meta-level similarities). Based on this study, no explanation can be given with regard to the diversity in these models. Therefore, further research is needed to explain these variations. For example, by generating a set of hypotheses through in-depth case studies that also focus on the context of AMCs. These hypotheses can then be tested in a larger number of countries.

1. INTRODUCTION

Academic Medical Centres (AMCs) originated at the end of the 18th century as academic medicine became increasingly institutionalised in a few Paris hospitals. In 1910, the former pedagogue and reformer of the American education system, Abraham Flexner, presented his ideas on the then-current system of medical education in US. This report caused a radical change in the North American medical education system and laid the foundation for today's evidence-based academic medicine [1, 2]. Although the term academic medical centre is used in numerous countries, there is currently no universally accepted definition. The most common way of defining an AMC is its tripartite mission, which consists of patient care, research, education, and their relation to universities [3-5]. This tripartite mission suggests that AMCs are expected to achieve high standards of (specialised) clinical care, perform fundamental and translational research, and educate doctors and other health professionals [6-8]. The existence of different organisational components within one organisation ensures variability and thus complexity in the organisational structure of an AMC [9]. Since their establishment, these complex organisations have been confronted by healthcare reforms and challenged in their business operations [10, 11]. AMCs are continually adapting and devising solutions to internal and external influences. These include growing medical knowledge, staff shortages, emerging expensive technologies, and ageing patient populations with new demands for care. AMC leaders must cope with tension regarding the distribution of financial resources and competition with other healthcare providers [1, 12-14]. Governments have increasingly emphasised the public and social role of AMCs [15, 16]. According to Raus et. al, AMCs must adapt to this new reality [1]. Although the world around AMCs is changing rapidly, they are still largely organised according to a century old model. However, the current model is slowly evolving towards a dynamic and integrated model in which there is more focus on integration of care and collaboration between different organisations. There is an increasing emphasis on the use of evidence-based medicine and big data and artificial intelligence in clinical practice. To meet contemporary challenges (e.g. financial, human resources, competitive and social), solutions are regularly sought in governance and organisational structures [17-22]. So far, most of the literature on the governance and organisation of AMCs is based on the situation in North America as the issues facing AMCs worldwide are similar [4, 23, 24]. The literature presents little information on AMCs' governance and organisation in other countries.

This research aims to map and identify literature on the governance and organisation of European AMCs.

Specifically, the literature on the relationship between medical schools and AMCs, the organisation of governing bodies, and the legal ownership of AMCs in eight European countries: Czech Republic, Germany, Latvia, Netherlands, Poland, Spain, Sweden, and United Kingdom were identified and analysed

2. METHODS

To map and analyse the literature on the governance and organisation of European AMCs, a scoping review was used, a common and valuable approach for mapping and identifying gaps, according to Munn et al. [25]. This review was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analysis: for Scoping Reviews (PRISMA-ScR) guidelines [26, 27].

2.1 Eligibility criteria

The study population consisted of a demographic cross-selection of AMC's from European countries.

Data from the Czech Republic, Germany, Latvia, the Netherlands, Poland, Spain, Sweden, and the United Kingdom were included.

2.2 Information sources

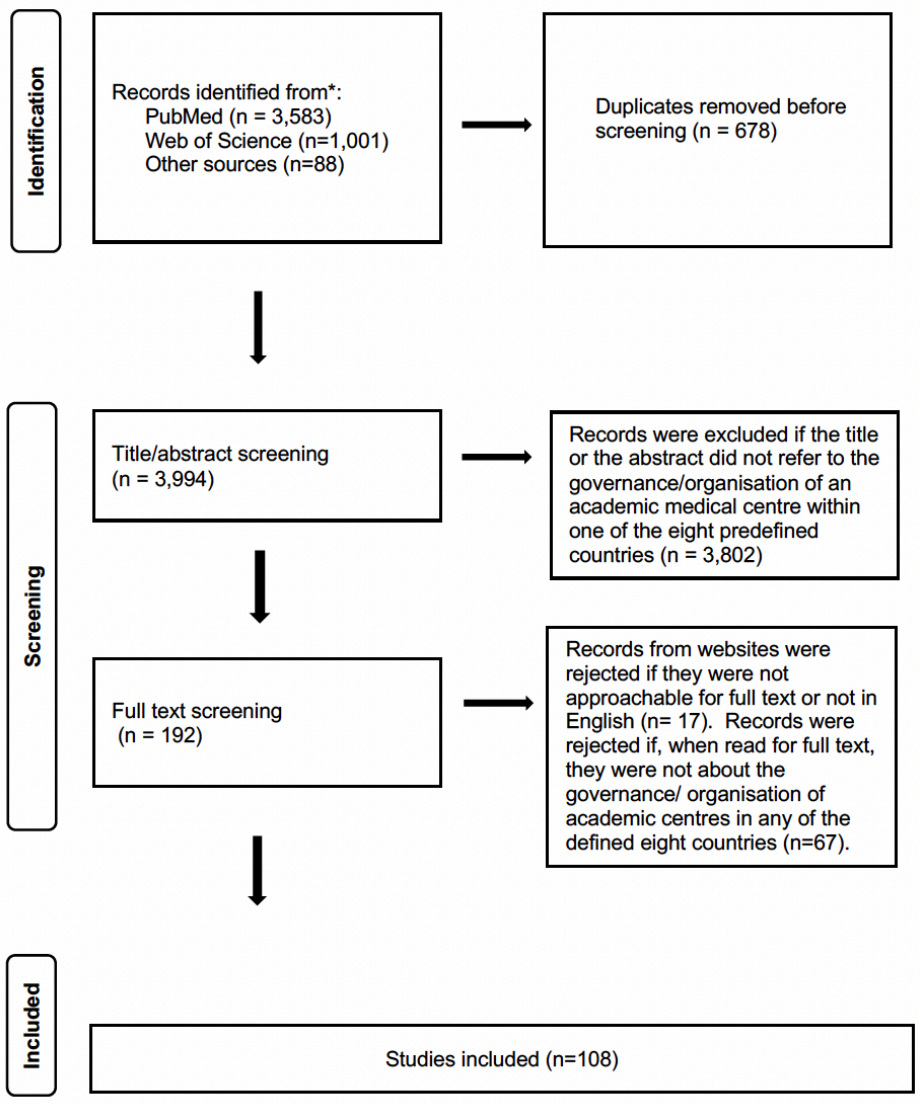
To identify relevant documents, the following bibliographic databases: PubMed and Web of Science were searched (most recent search date 17-06-2022, see supporting information Table S1). These databases were selected because they include a broad spectrum of scientific, health, and social science journals.

2.3 Search strategy

With the support of a librarian, two authors Ester Cardinaal (EC) and Heleen Duighuisen (HD) prepared a search string for PubMed and Web of Science. Table S1 details the search strategy. The search strategy consisted of three sections: 1) academic medical centres, 2) AMC governance/organisation, and 3) selection of the number of countries. Each section using MeSH (Medical

Subheadings) terms and title/abstract terms was searched (free text words). Another author Patrick Jeurissen (PJ) verified the search strategy. In total 4,584 publications were found, of which 3,583 were from PubMed and 1,001 were from Web of Science. Fig 1 shows that the search strategy yielded 4,672 records for consideration, of which 4,584 were from database searches and 88 from other sources (see supporting information Other Sources). After screening and reviewing full-text papers, 108 articles were included.

Figure 1 Identification of studies via databases and other sources



2.4 Selection of sources of evidence

Other sources were included in the review (see supporting information File S1 Other Sources). The review revealed that recent literature on the governance and organisation of the eight European AMCs is limited. As grey literature is becoming increasingly important for many types of review, it has been included to enrich the literature review [28]. The term grey literature is defined as "that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers" [29]. Google search engines were used to conduct targeted searches for websites in the eight countries selected. Government websites and documents were accessed to identify AMCs, research institutes, and medical universities. Subsequently, the websites of identified institutes were screened.

After reviewing the selected literature, additional articles using backwards citations were identified and included in the review. Fig 1 shows the search results.

2.5 Critical appraisal, data charting process, synthesis of results

The literature review included evidence sources from PubMed and Web of Science, as these cover a broad spectrum of scientific, health, and social science journals. The results had to relate to the organisation and governance of AMCs in Czech Republic, Germany, Latvia, Netherlands, Poland, Spain, Sweden, and the United Kingdom. When examining the grey literature, the classifications provided by Adams et al. were referred to: the degree to which the authority of the literature producer can be determined, and the degree to which literature is published in relation to explicit and transparent criteria [30]. Sources of high control and credibility, such as government reports, books and journals, and sources of moderate control and credibility, such as annual reports and news articles, were included. Sources that could be classified as low outlet control and low credibility, such as blogs, tweets, and e-mails, were excluded [30]. Google search engines were used to access sources published on the official websites of the AMC or the medical school. Sources related to the management and/or organisation of the institute were selected. Given the language skills of the researchers, sources in English, Dutch and German could be included. For this reason, sources in Swedish, Czech, Polish, Spanish and Latvian were excluded, unless the websites offered an option for translation into English.

The study focused on three elements related to the organisation of an AMC. These elements were drawn from Weiner's organisational theory [20]. Weiner created eight organisational models based on three dimensions: clinical enterprise organisation, academic-clinical enterprise integration, and authority position of the chief academic officer/medical dean. These principles helped to categorise the findings. One reviewer (HD) developed a data-charting form based on Weiner's organisation models, which was verified by two other reviewers (EC and PJ) (see Table 1). These three reviewers discussed these results and updated them in an iterative process.

Table 1. Overview of the governance and organisation of AMCs per country

	Czechia	Germany
Relation medical school - AMC:		
Hospital is related to one medical school	X	X
Hospital is related to more than one medical school	X	
Medical school owns hospital		
Governing body:		
One governing body for academic and clinical part		X (integration model)
Separate governing bodies for medical school and AMC	X	X (cooperation model)
Medical dean part of clinical governing body		X
Legal structure:		
One legal entity for academic and clinical part		X (integration model)
Separate legal entities for academic and clinical part	X	X (cooperation model)
Public ownership[c]	X (central)	X[d] (regional)
Private ownership[c]		X

N/A: not available [a]Not used anymore [b]'Special' UMCs [c]No remark meaning equal ownership for hospital and medical faculty (university) [d]Most common form of ownership [e]Hospital and medical school have different legal entities (hospitals private, university 6/8 public 2/8 private) [f]University hospitals of medical universities[f]

Table 2. AMC characteristics per country

Country	Number of AMCs	AMC per 10 million inhabitants	Local name for AMC
Czechia	10	9.3	Fakultní Nemocnice
Germany	34	4.1	Universitätsklinikum
Latvia	3	15.9	Universitātes slimnīca
Netherlands	7	4.1	Universitair Medisch Centrum
Poland	N/A	N/A	Szpital Kliniczny
Spain	102	21.8	Hospital universitarioc
Sweden	7	6.9	Universitetssjukhuset
United Kingdom	8	1.2	Academic Health Science Centre

[a]Simple refers to simple patientcare, research and undergraduate medical education
[b]Highly complex refers to highly complex patientcare, translational research and under- and postgraduate medical education [c]University- associated hospitals not included

Latvia	Netherlands	Poland	Spain	Sweden	United Kingdom
	X	X	N/A	X	N/A
X			N/A		N/A
		X			
	X	N/A			X (joint leadership +management model)[a]
X		N/A	X	X	X (joint partnership model)
	X			X	X (joint leadership and management model)
	Xb				
X	X	X	X	X	X
X (central)	X[e] (central)	X[f] (central)	X[d] (regional)	X (regional)	X (central)
	Xe		X		

English/literature name for AMC	Tripartite mission		Additional missions
	Simple[a]	Highly complex[b]	
University hospital, teaching hospital	X [31]	X [31, 32]	
University hospital		X [33, 34]	Innovation [33]
University hospital		X [35]	Public health [35], innovation [36, 37]
University Medical Centre		X [38]	Public health, innovation [38]
University hospital	X [39, 40]		
University hospital	X [41]	X [42]	
University hospital		X [43-45]	Innovation [46]
Academic Health Science Centre		X [47]	Innovation [48], wealth creation [47]

2.6 Data items

The variables were limited to eight countries: Czech Republic, Germany, Latvia, Netherlands, Poland, Spain, Sweden, and United Kingdom.

3. RESULTS

In this study, institutions are considered AMCs if they are designated with a special term, engaged in patient care, research, and education, and have a relationship with an university (Table 2).

Meta-level similarities in the relationship between hospitals and medical schools, the role of the dean within governing bodies and legal ownership, were discovered. However, these similarities have different nuances.

3.1 Medical schools and AMCs

In 2017, German medical education was offered at 36 medical faculties at public universities and at a small minority of private universities [49]. Two models are used in the “Universitätsklinikums” [34, 50]. The first is the cooperation model, which is characterised by the legal separation of the university hospital (patient care) and medical school (research and education). The second model is the integration model, in which the medical school (research and education) and university hospital (patient care) form one legal entity and are integrated in all areas [51, 52].

The governance and organisational aspects of the Dutch "Universitair Medisch Centra" are defined in the Dutch Law on Higher Education [53]. The Ministry of Health, Welfare, and Sport and health insurance companies contribute to financing patient care; while the Ministry of Education, Culture, and Science finance education and research. Universities contribute to the financing of education and research, as well as providing a workplace to train doctors in medical schools and hospitals.

In Poland, the Ministry of Health has established medical universities, which in turn have established medical university hospitals. The Ministry of Health and territorial self-governments are responsible for the governance of the health system, medical research, and education [54]. University hospitals are specialised hospitals that provide highly complex patient care, as well as perform medical education and research via the medical school [55, 56].

The total number of Polish AMCs is difficult to establish due to various data sources. There is a variance from nine medical universities [57] to fifteen medical faculties [58] and up to 20 medical faculties (public and private, including twelve medical universities). In 2016, medical universities owned 36 hospitals [54]. Medical education used to only be offered at medical universities. However, as a result of physician shortages, usually in provinces that did not count any medical universities, medical education was also offered at medical faculties of nonmedical, multi-faculty universities [54]. Medical universities use various non-academic hospitals for their clinical training.

In Spain, there are 102 Spanish “hospitales universitarios” (university or teaching hospitals) [59]. The relationship between Spanish teaching hospitals and universities is defined by the teaching hospital title granted by the government if most or all the hospital's care units are used for either clinical teaching or university research.

In Sweden, the tripartite mission is present in seven university hospitals (“universitetssjukhuset”) that provide highly specialised care [43] and fulfil a role in the training of medical staff [46]. At least until 2011, academic missions were fulfilled by seven public universities providing undergraduate medical education [60].

In 2007, the United Kingdom’s Department of Health established several cross-sector collaborations, one of which was the establishment of academic health science centres [61]. Partnerships consist of universities, medical schools [62], and hospitals, which are known as either university or teaching hospitals.

In the Czech Republic, the tripartite mission can be seen in so-called university hospitals or teaching hospitals (“Fakultní Nemocnice”) [32]. All university hospitals have partnerships with medical faculties [63].

In Latvia, clinical education takes place at three university hospitals (“universitātes slimnīca”) and non-university hospitals [35].

3.2 Governing bodies

Although the organisation of European AMCs differs, the role of the dean is important both in the medical school and hospital, confirming the findings of Weiner et al. [20].

Within the different contextual frameworks, these European countries have shaped the governing bodies of an AMC in their own ways. For example, in Germany, hospital boards ("Klinikumsvorstand") head university hospitals. In general, the board includes a medical director (often the chairperson), administrative/commercial director, nursing director, and medical dean. Tasks within the boards may differ and depend on the organisational model, legal form, and board composition. The dean is responsible for academic matters such as research and teaching. These tasks are similar across all German university hospitals [50].

Dutch AMCs and medical faculties delegate responsibilities to an AMC executive board to ensure effective fulfilment of the tripartite mission of clinical care, medical education and research. For the same reason, the dean has a role in both the medical school and AMC boards [4]. The administration and working relationship between the university and hospital are regulated by law [53]. Members of the supervisory board are appointed by the Minister of Culture and Education [4, 64].

Swedish AMCs are governed by the respective regional administrative entities [65]. University hospitals can be subordinate to a regional administrative body that manages other hospitals [66]. The dean is the highest governing authority of the medical school [67] and is subordinate to the vice-chancellor [68-70] who is in turn subordinate to the university board, the highest governing body of the university [67, 69, 71]. Most of the board is appointed by the government according to Swedish law [72]. In some cases, the university hospital boards include the dean [73] and, others do not [74, 75].

In the United Kingdom, all university hospitals are part of the National Health Service (NHS). These hospitals are registered with either NHS Trusts or NHS Foundation Trusts [76]. NHS Trusts are statutory organisations that have been authorised by the Secretary of State for Health and Social Care to operate care centres or hospitals. NHS Foundation Trusts are more autonomous organisations with boards accountable to a board of governors that represents local communities [77].

In the Czech Republic, the governing bodies of medical schools typically consist of a dean as the highest governing body of the medical school, faculty management, an academic senate, and a scientific board [78-81].

The academic senate and scientific board also have important decision-making powers [82]. The Ministry of Education supervises educational tasks [32].

Latvian AMC governance is defined in Latvian law, which provides for a two-tier structure of a management/executive board and supervisory board [83, 84]. The university hospital's executive board is the primary governing body within the university hospital that falls under the supervisory board. The nomination of members for both boards is also regulated by law. The highest governing body of the medical school in Latvia is the vice-rector or dean (subordinate to the vice-rector) [85]. The vice-rector is subordinate to the rector of the university [86].

In Poland, university hospitals are supervised by the Ministry of Health [56] with a management team headed by a director or CEO (Chief Executive Officer) [87, 88]. Within medical universities, the highest governing body is the rector [89-91] with the dean of the medical school governing the medical school [92, 93]. The vice-rector is responsible for clinical affairs, such as the supervision, inspection, and administrative support of teaching hospitals [89, 94, 95].

In Spain, the highest governing body within the university hospital is the management ("Gerencia") [96, 97] while the faculty board is the highest governing body within the medical school. Both the university hospital and medical school are governed by the faculty board and management team [98-100]. The dean plays an important role at both the university hospital and medical school [98, 99, 101].

3.3 Legal ownership

Public ownership of medical schools and associated university hospitals is the most common form of ownership. Most national models show separate legal entities, suggesting that functional integration is the preferred model over institutional integration. Countries without an integration model described in the literature show characteristics of functional integration in a "collaborative" or "joint partnership" model. These models exhibit separate governing bodies and legal entities for both hospitals and medical schools. This observation has a wide range of differences as illustrated by numerous country-specific nuances.

For instance, Czech university hospitals have partnerships with medical faculties. University hospitals can provide clinical education for several medical faculties [31].

In Germany, university hospitals can be regarded as a network that creates collaboration between patient care, research, and education, although they are not obliged to perform research or provide education [34]. Most university hospitals have become independent legal institutions under public law. Some German states have implemented the “corporate solution” in which the university hospital operates in the form of a corporation under public law and, provides members of the corporation with a certain degree of influence. Conversely a minority of the states have arranged university hospitals under private law. A minority of university hospitals operates under other legal forms [50].

In Latvia, universities and university hospitals are state-owned [35]. This is in contrast to most Latvian hospitals, which are owned by municipalities and have less stringent operating obligations than state-owned hospitals [102].

The Dutch Law on Higher Education views universities and AMCs as separate and independently governed units. The law regulates the administration and working relationship between universities and hospital [53]. Of the eight Dutch AMCs six involve partnerships between public universities and private hospitals where both the academic and clinical parts maintain their own legal entity. The remaining two “special” AMCs involve partnerships between private universities and hospitals [4, 64].

In Poland, university hospitals are owned by medical universities, while medical universities are publicly owned [55].

Spain is divided into seventeen autonomous communities (ACs), each with its own legislative and executive autonomy, parliament, and government. The decentralisation of public and social security healthcare centres, services, and competencies in 2002 led to an increase in regulative powers for the ACs [103]. ACs lead public health services via local public agencies. Although ownership and organisational models of hospital care vary substantially, most university hospitals are owned by these local public agencies [103]. Private non-profit ownership plays a substantial role in the governance of the Madrid and Catalonia ACs [59]. Several university hospitals are affiliated with a

medical school. Partnerships between medical faculties, university hospitals (or university-associated hospitals), and medical faculties and research institutes ensure clinical and research education [104, 105]. Currently, there are 49 faculties where medical degrees can be obtained, with the majority of them being owned by public governments through ACs [106].

In the United Kingdom, all university hospitals are part of the NHS [61, 62]. Partnerships consist of universities and hospitals, which are called either universities or teaching hospitals. Both universities and hospitals are publicly owned [62]. Additionally, instead of being subject to the Department of Health, foundation trusts are supervised by Monitor, a regulatory body [77]. Accountability is divided since universities, university hospitals and, research institutes are accountable to different government departments [47, 107].

The Swedish healthcare system is decentralised, with the main responsibility for the provision and financing of healthcare resting with regional bodies. There are 21 counties, which are further divided into six medical regions to provide better cooperation in tertiary care [44]. University hospitals, like most other hospitals in the country, are publicly owned [43].

4. DISCUSSION

Differences in the organisation, governing bodies, and legal structures of European AMCs have a cultural and historical background in which the government's views, laws, and regulations play an important role. At a meta-level, this study identified three common factors across the eight countries studied. First, most countries operate with separate governing bodies and legal entities for the medical school and hospital. Second, most countries have a dean who simultaneously plays a role in the organisation of both the medical school and hospital. Finally, most countries prefer a functionally integrated relationship between medical schools and hospitals. Despite these common factors, a variety of reasons why a particular governance organisation and ownership structure was chosen, emerged from this research. A multitude of internal and external conditions, challenges, and objectives drive organisations to rethink and adapt their organisation and legal structures [11, 12, 108]. Examples from this study illustrate these different national perspectives and circumstances.

Since the 1990s, Germany has wanted to measure up in global competition. To achieve this, the country needed to become more manageable and flexible [34, 109, 110]. In 2006, the privatisation of two merged university hospitals in Germany was conducted to achieve synergy effects, but ultimately failed [111, 112]. For the same reason, one of the Dutch AMCs recently changed the university and medical school to two different legal entities [113]. Similar considerations in the United Kingdom led to the formation of academic health science centres in 2009, building on existing AMC structures [23, 114]. In Poland, there were other reasons for opting to separate universities and AMCs. Medical faculties were part of universities until the 1950s. They became independent medical universities to make them more accessible to the public [115]. Moreover, due to a shortage of doctors, mostly in provinces that did not have medical universities, the government had to allow nonmedical universities to train doctors as well [56]. In Sweden, collaborations and mergers between AMCs and other hospitals, universities, and training institutions are increasing, mainly to meet steadily rising costs [60, 116].

Weiner et al. [20] presented eight organisational models based on three dimensions: clinical enterprise organisation, academic-clinical enterprise integration, and the authority position of the chief academic officer. The eight models describe mutual relationships and propose ideas on the distribution of power in decision-making processes. However, Weiner et al. emphasise that “few, if any [of the existing AMCs], are likely to resemble these pure forms”, demonstrating the complexity and variability of an AMC organisation. This variability is reflected in the results. Therefore, it is striking that despite this multitude of different perspectives, more or less the same organisation, legal structure, and functionally integrated relationship between universities and hospitals seem to be preferred without considering the challenges faced by AMCs. The review reveals that while the baseline organisation of AMCs seems similar, there is significant variation in how they are implemented in practice. Factors other than organisation are more important in determining the functionality of AMCs.

This research was deliberately broad in scope to get an overview of the range of literature on AMC governance and organisation. Despite its strengths, this review has several limitations. Some literature may not have been detected as only two databases were consulted. To overcome this, additional information was manually searched for. The definition of an AMC is not unambiguous and depends on contextual factors; thus, it may

not be possible to find all relevant organisations. This was addressed by establishing a definition for an AMC beforehand (university-AMC relationship and tripartite mission). Furthermore, the selection of only eight European countries may not reflect the diversity of AMC governance and organisation in other European countries. Finally, it could be a limitation that the purpose of scoping reviews is not to produce a critically assessed and synthesised answer to a particular question, but to provide an overview of the evidence; therefore, its practical implications are quite different from those of a systematic review. Despite these limitations, this study identified evidence-based gaps, providing a stimulus to fill those gaps through further research.

5. CONCLUSION

Little literature exists on the organisation of European AMCs. The use of national-level websites complements the literature and gives a more complete picture of the organisation of these organisations. The organisation of AMCs in the eight countries studied show meta-level similarities in terms of the relationship between universities and AMCs, the role of the dean and the public ownership of the medical school and the AMC. Most countries have separate governing bodies and legal entities for the medical school and the hospital, have a dean who simultaneously plays a role in the organisation of both the medical school and the hospital, and prefer a functionally integrated relationship between the medical school and the hospital. However, the organisation of AMCs in the eight countries seems to differ when it comes to why a particular organisation and ownership structure is chosen. Several factors influence the choice of a particular organisation and legal structure including internal and external circumstances, challenges and objectives. There is no uniform model for AMC organisations (apart from some meta-level similarities). Based on this study, no explanation can be given for the diversity in these models. Therefore, further research is needed to explain these variations. For example, by generating a set of hypotheses through in-depth case studies that also focus on the context of AMCs. These hypotheses can then be tested in a larger number of countries.

References

1. Raus K, Mortier E, Eeckloo K. Past, present and future of university hospitals. Acta Clin Belg. 2020;75(3):177-84. Raus K, Mortier E, Eeckloo K. Past, present and future of University Hospitals. Acta Clinica Belgica. 2019;75(3):177–184.
2. Diller L. 100 years later, the Flexner Report is still relevant. Hastings Center Report. 2010;40(5):49.
3. Blumenthal D, Meyer GS. The future of the academic medical center under Health Care Reform. New England Journal of Medicine. 1993;329(24):1812–1814.
4. Davies SM, Tawfik-Shukor A, de Jonge B. Structure, governance, and organizational dynamics of University Medical Centers in the Netherlands. Academic Medicine. 2010;85(6):1091–1097.
5. Dzau VJ, Cho A, ElLaissi W, Yoediono Z, Sangvai D, Shah B, et al. Transforming Academic Health Centers for an uncertain future. New England Journal of Medicine. 2013;369(11):991–993.
6. Wartman SA. Toward a virtuous cycle: The changing face of Academic Health Centers. Academic Medicine. 2008;83(9):797–799.
7. Guo KL. Roles of managers in academic health centers. The Health Care Manager. 2002;20(3):43–58.
8. Hastings DA, Crispell KR. Policy-making and governance in academic health centers. Academic Medicine. 1980;55(4):325–332.
9. Lee PR. A tiger by the tail. Academic Medicine. 1973;48(1):27–39.
10. Aitken R. Universities and government the constant dialogue. The Lancet. 1966;288(7458):331– 332.
11. Durán A, Wright S. Understanding hospitals in Changing Health Systems. Basingstoke: Palgrave Macmillan; 2021.
12. Chari R, O'Hanlon C, Chen P, Leuschner K, Nelson C. Governing Academic Medical Center Systems. Academic Medicine. 2018;93(2):192–198.
13. Morrison JM, Wood DF. Academic medicine in crisis. Medical Education. 2004;38(8):796–797.
14. Schmidt CE, Möller J, Hesslau U, Bauer M, Gabbert T, Kremer B. Universitätskliniken im Spannungsfeld des Krankenhausmarktes. Der Anaesthesis. 2005;54(7):694–702.
15. Baker MG, Singhal BS, Menken M. Governance of Academic Medicine should be with public trustees. BMJ. 2004;329(7469).
16. Schippers E. Positioneringsnota UMCs (2014-07-11) [Internet]. Available from: https://open.overheid.nl/ documenten/ronl-archief-36d43656-fc9b-4073-9c20-dc3bdc308837/pdf.[Last accessed 2024-03-30].
17. Woolf SH. The meaning of translational research and why it matters. JAMA. 2008;299(2).
18. Cardinaal E, Dubas-Jakóbczyk K, Behmane D, Bryndová L, Cascini F, Duighuisen H, et al. Governance of academic medical centres in changing healthcare systems: An international comparison. Health Policy. 2022;126(7):613–618.
19. Minkman MMN. Longing for Integrated Care: The Importance of effective governance. International Journal of Integrated Care. 2017;17(4).
20. Weiner BJ, Culbertson R, Jones RF, Dickler R. Organizational models for Medical School—Clinical Enterprise Relationships. Academic Medicine. 2001;76(2):113–124.
21. Siewert JR. The Surgical University Hospital: Perspectives in the 21st Century. The American Journal of Surgery. 2007;194(4).

22. Schreyögg J, von Reitzenstein C. Strategic groups and performance differences among Academic Medical Centers. Health Care Management Review. 2008;33(3):225–233.
23. French CE, Ferlie E, Fulop NJ. The international spread of Academic Health Science Centres: A scoping review and the case of policy transfer to England. Health Policy. 2014;117(3):382–391.
24. Blumenthal D, Edwards N. A tale of two systems: The Changing Academic Health Center. Health Affairs. 2000;19(3):86–101.
25. Munn Z, Peters MD, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic Review or scoping review? guidance for authors when choosing between a systematic or scoping review approach. BMC Medical Research Methodology. 2018;18(1).
26. Colquhoun HL, Jesus TS, O'Brien KK, Tricco AC, Chui A, Zarin W, et al. Study protocol for a scoping review on rehabilitation scoping reviews. Clinical Rehabilitation. 2017;31(9):1249–1256.
27. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. Prisma extension for scoping reviews (PRISMA-SCR): Checklist and explanation. Annals of Internal Medicine. 2018;169(7):467–473.
28. Manietta C, Rommerskirch-Manietta M, Purwins D, Roes M. Consulting concepts and structures for people with dementia in Germany: A protocol for a 'grey-shaded' scoping review. BMJ Open. 2022;12(4).
29. Paez A. Gray literature: An important resource in systematic reviews. Journal of Evidence-Based Medicine. 2017;10(3):233–240.
30. Adams RJ, Smart P, Huff AS. Shades of grey: Guidelines for working with the grey literature in systematic reviews for management and Organizational Studies. International Journal of Management Reviews. 2016;19(4):432–454.
31. Hauge M. About US - University Hospital in Motol [Internet]. Fakultní nemocnice v Motole. c2022. Available from: https://www.fnmotol.cz/en/o-nas/ [Last accessed 2022-10-30].
32. Alexa J, Rečka L, Votápková J, Van Ginneken E, Spranger A, Wittenbecher F. The performance of the Czech health system: Untapped potential for efficiency gains and health improvement. European Journal of Public Health. 2015;25(suppl_3).
33. Die Sonderrolle der deutschen Universitätsklinika. Die Deutschen Universitätsklinika. [Internet]. Available from: https://www.uniklinika.de/die-deutschenuniversitaetsklinika/sonderrolleuniversitaetsmedizin/. [Last accessed 2024-03-31].
34. Deutscher Bundestag WD. Ausarbeitung Begriff, Rechtsformen und Finanzierung der Universitätskliniken in Deutschland [Internet]. Available from: https://www.bundestag.de/resource/blob/417706/6e9eb8e17dbe2a1905d3fc8d9a4acf51/WD-9-16-pdf-data.pdf. [Last accessed 2024-03-30].
35. Public Report on the State-Owned Enterprises and Shares in 2018 . Valsts Kapitālsabiedrību Pārvaldība. Cross-Sectoral Coordination Centre Republic of Latvia; 2019 [Internet]. Available from: https://issuu.com/guntis.rozenbergs/docs/gp2019_latvia_report-onstate_ municipalities-owned. [Last accessed 2024-03-31].
36. Paula Stradiņa Klīniskā universitātes slimnīca. Mission / Vision / Strategy [Internet]. Stradiņa slimnīca. 2019 [Internet]. Available from: https://www.stradini.lv/lv/content/misija-vizijastrategija. [Last accessed 2024-03-31].

37. Rīgas Austrumu Klīniskā Univiersitātes Slimnīca. About Riga East University Hospital . [Internet]. Available from: https://aslimnica.lv/en/. [Last accessed 2024-03-31].

38. Nederlandse Federatie van Universitair Medische Centra. Over de NFU. [Internet]. Available from: https://www.nfu.nl/nfu/over-de-nfu. [Last accessed 2024-03-31].

39. Medical University of Lodz. Teaching hospitals. [Internet]. Available from: https:// studymed.umed.pl/about-mul-2/teaching-hospitals/. [Last accessed 2024-03-31].

40. Medical University of Warsaw. Teaching hospitals [Internet]. Available from: https:// www.wum.edu.pl/en/kliniki. [Last accessed 2024-03-31].

41. Puerta JL, Martín-Moreno JM, Bravo S, Gutiérrez-Fuentes JA. Valoración de la investigación que se realiza en los hospitales españoles. Revista Clínica Española. 2011;211(4):169–178.

42. Agencia Estatal Boletín Oficial del Estado. Consolidated Legislation [Internet]. Available from: https://www.boe.es/buscar/act.php?id=BOE-A-1986-20584. [Last accessed 2024-03-31].

43. OECD and European Observatory on Health Systems and Policies. Sweden: Country health profile 2021. State of Health in the EU. 2021.

44. Anell A, Glenngård AH, Merkur S. Sweden health system review. Health Syst Transit. 2012;14(5):1-159. PMID: 22894859

45. Commonwealth Fund. International Profiles of Health Care Systems, 2015 [Internet]. Available from: https://www.commonwealthfund.org/publications/fund-reports/2016/jan/ international-profiles-health-care-systems-2015. [Last accessed 2022-10-30].

46. Universitetssjukhuset Örebro. About Us. 2014 [Internet]. Available from: https://www.oru.se/english/about-us/. [Last accessed 2024-03-31].

47. Ovseiko PV, Heitmueller A, Allen P, Davies SM, Wells G, Ford GA, et al. Improving accountability through alignment: The role of Academic Health Science Centres and networks in England. BMC Health Services Research. 2014;14(1).

48. Academic health science networks [Internet]. Available from: https://www.england.nhs.uk/aac/what-we-do/innovation-for-healthcare-inequalities-programme/academic-health-science-centres/. [Last accessed 2024-03-31].

49. Zavlin D, Jubbal KT, Noé JG, Gansbacher B. A comparison of medical education in Germany and the United States: from applying to medical school to the beginnings of residency. Ger Med Sci. 2017 Sep 25;15:Doc15. doi: 10.3205/000256. PMID: 29051721; PMCID: PMC5617919.

50. Debatin JF, Rehr J. Die Rollen der Vorstandsmitglieder in Einem Universitätsklinikum. Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz. 2009;52(9):891–898.

51. Hormuth S. Zum verhältnis Zwischen Medizinischer Fakultät und Universität. Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz. 2009;52(9):899–903.

52. Siewert JR, Merk S. Das Verhältnis von Klinikum und Fakultät. Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz. 2009;52(8):807–810.

53. Wet op het hoger onderwijs en wetenschappelijk onderzoek [Internet]. Available from: https://wetten.overheid.nl/BWBR0005682/. [Last accessed 2024-03-31].

54. Sowada C, Sagan A, Kowalska-Bobko I, Badora-Musial K, Bochenek T, Domagala A, et al. Poland: Health System Review. Health Syst Transit. 2019 Jun;21(1):1-234. PMID: 31333192.

55. Dubas-Jakóbczyk K, Kocot E, Kozieł A. Financial Performance of Public Hospitals: A crosssectional study among Polish providers. International Journal of Environmental Research and Public Health. 2020;17(7):2188.

56. OECD and European Observatory on Health Systems and Policies. Poland: Country health profile 2019: En [Internet]. Available from: https://www.oecd.org/health/poland-country-healthprofile- 2019-297e4b92-en.htm. [Last accessed 2024-03-31].
57. European Statistical System. Statistics Poland [Internet]. Available from: https://stat.gov.pl/en/topics/statistical-yearbooks. [Last accessed 2022-11-01].
58. The Polish National Agency for Academic Exchange. The Polish National Agency for Academic Exchange [Internet]. Available from: https://nawa.gov.pl/en/nawa . [Last accessed 2022-11-02].
59. Ministry of Health. National Catalogue of Hospitals [Internet]. Available from: https://www.mscbs.gob.es/ ciudadanos/prestaciones/centrosServiciosSNS/hospitales. [Last accessed 2022-10-30].
60. Lindgren S, Brännström T, Hanse E, Ledin T, Nilsson G, Sandler S, et al.; Medical education in Sweden [Internet]. Available from: https://pubmed.ncbi.nlm.nih.gov/21942478/. [Last accessed 2022-10-31].
61. Ovseiko P, O'Sullivan C, Powell S, Davies S, Buchan A. Implementation of collaborative governance in cross-sector Innovation and Education Networks: Evidence from the National Health Service in England. BMC Health Services Research. 2014;14(S2).
62. Medical Schools Council. Medical schools [Internet]. Available from: https://www.medschools.ac.uk/ studying-medicine/medical-schools. [Last accessed 2022-10-30].
63. Medical Study Guide. Study medicine in the Czech Republic [Internet]. Available from: https://medicalstudyguide.com/medicine-in-czech-republic.html. [Last accessed 2022-10-31].
64. Vrije Universiteit Amsterdam. Policy and organisation [Internet]. Available from: https://vu.nl/en/employee/ policy-and-organisation. [Last accessed 2022-10-30].
65. Region Östergötland. Our hospitals [Internet]. Available from: https://www.regionostergotland.se/ro/dethar- gor-vi. [Last accessed 2024-03-31].
66. Skåne University Hospital. Our organisation [Internet]. Available from: https://vard.skane.se/en/skaneuniversity- hospital/about-us/our-organisation/. [Last accessed 2022-10-30].
67. Umea University. About the faculty. [Internet]. Available from: https://www.umu.se/ en/faculty-of-medicine/about-the-department/. [Last accessed 2022-10-30].
68. Linköping University. The organisation of Linköping University [Internet]. Available from: https://liu.se/en/ about-liu/organisation. [Last accessed 2022-10-30].
69. Lund University. Organisational structure [Internet]. Available from: https://www.lunduniversity.lu.se/ about-lund-university/management-leadership/organisational-structure. [Last accessed 2022-10-30].
70. Örebro University. Organisation and governance [Internet]. Available from: https://www.oru.se/english/ about-us/organisation-and-governance/. [Last accessed 2022-10-30].
71. Uppsala University. The University Board [Internet]. Available from: https://www.uu.se/om-uu/organisation-och-styrning. [Last accessed 2024-03-31].
72. Swedish Council for Higher Education. The Swedish Higher Education Act (1992:1434) [Internet]. Available from: https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/The- Swedish-Higher-Education-Act/. [Last accessed 2024-03-31].
73. Region Östergötland. About the region. Healthcare. [Internet]. Available from: https:// www.regionostergotland.se/ro/det-har-gor-vi/halsa-och-vard. [Last accessed 2024-03-31].
74. Karolinska Institutet. Board of Karolinska Institutet [Internet]. Available from: https://ki.se/en/about/boardof- karolinska-institutet. [Last accessed 2022-10-30].

75. Akademiska Sjukhuset. Welcome to Uppsala University Hospital. [Internet]. Available from: https://www.akademiska.se/en/. [Last accessed 2022-10-30].

76. Dickson D. Is the UK ready for jointly managed Academic Medical Centers? Nature Medicine. 1998;4(3):256.

77. Ovseiko PV, Davies SM, Buchan AM. Organizational models of Emerging Academic Health Science Centers in England. Academic Medicine. 2010;85(8):1282–9.

78. Palacký University Olomouc. Faculty bodies [Internet]. Faculty of Medicine and Dentistry. 2022. Available from: https://www.lf.upol.cz/en/about/faculty-bodies/. [Last accessed 2022-11-01].

79. Charles University Third Faculty of Medicine. Statutory bodies [Internet]. 2022. Available from: https://www.lf3.cuni.cz/3LFEN-155.html. [Last accessed 2022-11-01].

80. Charles University. Organization structure [Internet]. 2013 . Available from: https:// www.lfhk.cuni.cz/Faculty/Organization-structure/. [Last accessed 2022-11-01].

81. University Masaryk. Faculty authorities [Internet]. Faculty of Medicine Masaryk University | MED MUNI. [Internet]. Available from: https://www.med.muni.cz/en/about-faculty/facultyauthorities. [Last accessed 2022-10-30].

82. Charles University First Faculty of Medicine. Faculty management. First Faculty of Medicine, Charles University. [Internet]. Available from: http://en.lf1.cuni.cz/facultymanagement. [Last accessd 2022-11-01].

83. Pētersone M, Ketners K, Krieviņš D, Kreicberga I, Eriņš I. Developing a comprehensive model for forthcoming reforms of University Hospitals. Management Theory and Studies for Rural Business and Infrastructure Development. 2019;41(2):183–196.

84. Bērnu klīniskā universitātes slimnīca. Scheme of the structure of the hospital [Internet]. 2018 [Internet]. Available from: https://www.developmentaid.org/organizations/view/423351/bernu-kliniskauniversitates- slimnica-childrens-clinical-university-hospital [Last accessed 2022-11-01].

85. University of Latvia. University structure. 2022. [Internet]. Available from: https://www.lu.lv/ en/about-us/structure/university-structure/. [Last accessed 2022-10-31}.

86. Rīga Stradiņš University. Structure. RSU. [Internet]. Available from: https://www.rsu.lv/en/about-us/structure. [Last accessd 2022-10-30].

87. Sobre la Universidad Pompeu Fabra. Estructura y organización - Sobre la Universidad Pompeu Fabra (UPF). [Internet]. Available from: https://www.upf.edu/es/web/universitat/estructuraorganitzacio. [Last accessed 2022-10-30].

88. Independent Clinical Hospital no. 1 Lublin. Directorate SPSK No. 1 [Internet]. Available from: https://www.spsk1.lublin.pl/dyrekcja. [Last accessed 2022-10-30].

89. Pomorski Uniwersytet Medyczny W Szczecinie. 2017. [Internet]. Available from: https:// www.pum.edu.pl/uniwersytet/uczelnia/. [Last accessed 2022-10-30].

90. Poznan University of Medical Science | Center for Medical Education. Authorities [Internet]. Available from: https://pums.ump.edu.pl/contact/authorities.html. [Last accessed 2022-10-30].

91. Wroclaw Medical University. Authorities 2021. [Internet]. Available from: https:// www.en.umed.wroc.pl/about/authorities. [Last accessed 2022-10-30].

92. Medical University of Gdańsk. Directory of MUG organizational structure 2022. [Internet]. Available from: https://structure.mug.edu.pl/. [Last accessed 2022-11-02].

93. Medical University of Warsaw. Teaching hospitals [Internet]. Available from: https:// www.wum.edu.pl/en/kliniki. [Last accessed 2024-03-31].

94. Medical University of Lodz. Teaching hospitals. 2022. [Internet]. Available from: https:// studymed.umed.pl/about-mul-2/teaching-hospitals/. [Last accessed 2022-10-30].

95. Medical University of Lublin. Organizational structure [Internet]. Available from: https:// www.umlub.pl/en/university/organizational-structure/. [Last accessed 2022-10-30].

96. Vall d'Hebron Hospital. Management [Internet]. Available from: https:// hospital.vallhebron.com/es/el-hospital/organizacion-y-participacion/equipo-directivo. [Last accessed 2022-10-30].

97. University Hospital Virgen de las Nieves. Organization. 2022. [Internet]. Available from: https://www.huvn.es/el_hospital/organizacion. [Last accessed 2022-10-30].

98. Universidad Complutenze Madrid. Composition of the Faculty Board [Internet]. Available from: https://medicina.ucm.es/composicion-de-la-junta-de-facultad. [Last accessed 2022-10-02].

99. Universidad Pompeu Fabra. Structure and organization [Internet]. Estructura y organización - Sobre la Universidad Pompeu Fabra (UPF). [Internet]. Available from: https://www. upf.edu/es/web/universitat/estructura-organitzacio. [Last accessed 2022-10-30].

100. Universidad de Granada. Governing bodies [Internet]. Faculty of Medicine. [Internet]. Available from: https://medicina.ugr.es/facultad/organos-de-gobierno#title1. [Last accessed 2022-10-30].

101. Universitat de Girona. Management team [Internet]. Available from: https://www.udg.edu/es/fm/facultat/estructura/organs-de-govern/equip-de-direccio. [Last accessed 2022-11-02].

102. OECD/European Observatory on Health Systems and Policies (2021). Latvia: Country Health Profile 2021 [Internet]. Available from: https://doi.org/10.1787/919f55f0-en. [Last accessed 2022-11-02].

103. Bernal-Delgado E, Garcia-Armesto S, Oliva J, Sanchez Martinez FI, Repullo JR, Pena-Longobardo LM, et al. Spain: Health System Review. Health Syst Transit. 2018 May;20(2):1-179. PMID: 30277216.

104. Universidad autónoma de Madrid. Research Centers and Institutes [Internet]. Available from: https://civis.eu/en/discover-civis/the-civis-alliance/universidad-autonoma-de-madrid. [Last accessed 2024-03-31].

105. Universidad de Sevilla. Teaching organisation [Internet]. Organización docente | Ordenación Académica : Universidad de Sevilla. [Internet]. Available from: http://servicio.us.es/ academica/organizacion-docente. [Last accessed 2022-11-02].

106. Ministerio de educacion, formacion profesional y deportes. Universidadis. https:// www.educacionyfp.gob.es/contenidos/universidad.html[Internet]. Available from: https:// www.educacionyfp.gob.es/contenidos/universidad.html. [Last accessed 2024-03-31].

107. Davies SM, Bennett A. Understanding the economic and social effects of academic clinical partnerships. Academic Medicine. 2008;83(6):535–540.

108. Academic Health Centers: Leading Change in the 21st Century. Academic Emergency Medicine. 2004;11(7):802–806.

109. Adelhard K, Matzko M, Brüning R, Holzknecht N, Stark V, Reiser M. Universitätskliniken als Zentren Radiologischer Leistungsallianzen im Ambulanten und Stationären Sektor. Der Radiologe. 2002;42(2):82–86.

110. Fleckenstein B. Das Konzept der exzellenzuniversitäten. Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz. 2009;52(9):940–948.

111. Arbeitsgemeinschaft Hochschulmedizin. Privatisierung der Hochschulmedizin Gescheitert. 2013. [Internet]. Available from: http://www.ag-hochschulmedizin.de/files/2013/Resolution-Privatisierung_der_Hochschulmedizin_7-2013.pdf. [Last accessed 2022-11-02].

112. Maisch B. Paradigmenwechsel in der universitären Medizin? [A paradigm change in German academic medicine. Merger and privatization as exemplified with the university hospitals in Marburg and Giessen]. Herz. 2005 Mar;30(2):153-158. German. doi: 10.1007/ s00059-005-2679-4. PMID: 15875106.

113. Radboud Universitair Medisch Centrum. Ontvlechting een feit en Nieuwe Raad van Toezicht [Internet]. Available from: https://www.radboudumc.nl/nieuws/2021/ontvlechting-een-feiten-nieuwe-raad-van-toezicht#:~:text=Per%201%20januari%20 2021%20is,het%20huidige %20college%20van%20bestuur. [Last accessed 2022-10-30].

114. Department of Health and Social Care. High quality care for all: NHS Next Stage Review Final Report [Internet]. Available from: https://assets.publishing.service.gov.uk/media/5a7c3a5b40f0b67d0b11fbaf/7432.pdf. [Last accessed 2024-03-31].

115. Kostrzewski J. An integrated approach to health services and Manpower Development: The experience of Poland. Health Policy and Education. 1980;1(2):197–211.

116. Choi S, Holmberg I, Löwstedt J, Brommels M. Executive Management in radical change—the case of the Karolinska University Hospital merger. Scandinavian Journal of Management. 2011;27(1):11–23.

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- S1_Table_Search details and history
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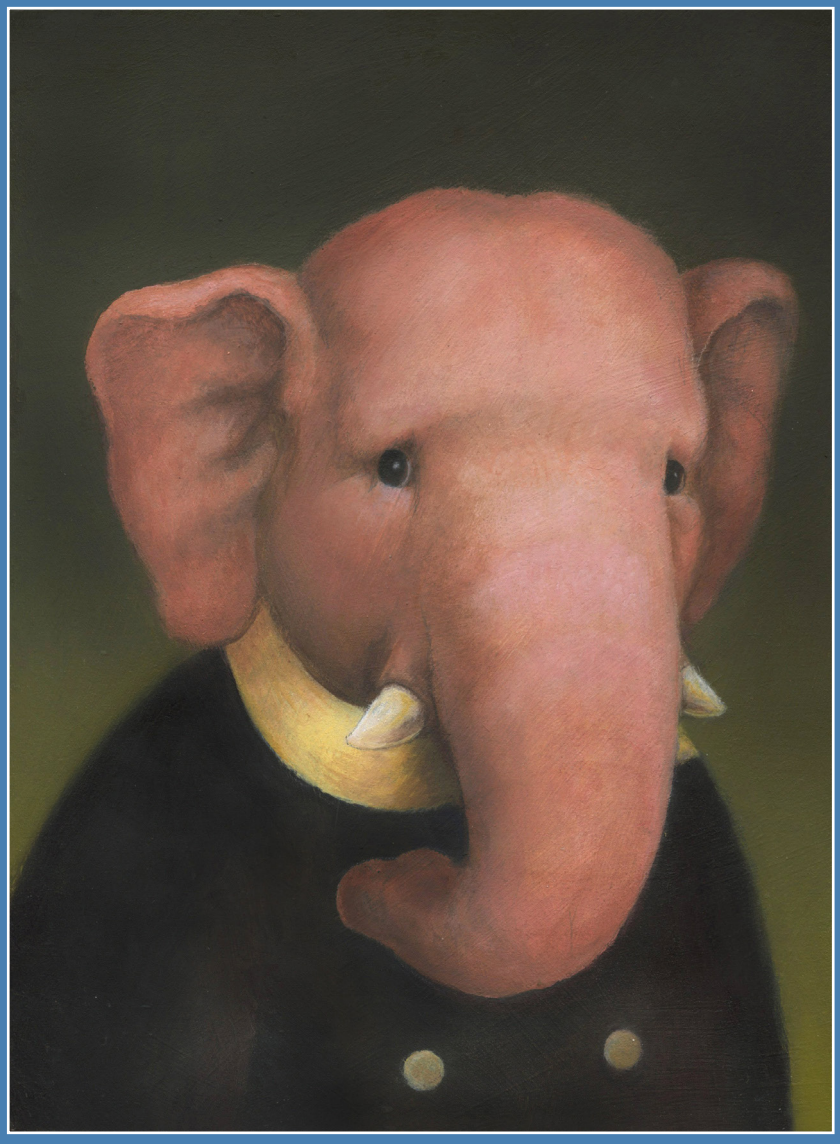

Chapter 3

Governance of academic medical centres in changing healthcare systems: An international comparison

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ABSTRACT

This study provides an exploratory and international comparison of the governance models of academic medical centres. These centres face important challenges such as disruptive external pressures and enduring financial conflicts among its tasks of patient treatment, research, and education. The analysis covers ten European countries (Cyprus, Czechia, Denmark, Germany, Italy, Latvia, Netherlands, Norway, Poland, and Spain) and one associated state (Israel), and is the first of its kind. An expert questionnaire has been developed for the collection of data on the governance of academic medical centres in these 11 countries. The results show that no standardised definition of Academical Medical Centre exists. Countries couple patient care, education/teaching, and research in different ways. Nevertheless, ownership of such institutions is remarkably homogeneous and restricted to public or private not-for-profit ownership. Important differences relate to the level of (functional) integration between the hospital and the medical school. Most experts believe that the governance of Academic Medical Centres will evolve to a more functionally integrated model of patient care, research, and education.

1. INTRODUCTION

Hospitals increasingly struggle with the consequences from ageing populations, advances in medical technology, rising healthcare costs, more needs to prevent chronic illnesses and more needs for both personalized and person centred care [1]. Hospitals will increasingly be actors in the responses to health shocks caused by major events such as epi- or pandemics, wars and other disasters, and are an important setting for training future cadres of health workers. Academic Medical Centres (AMCs) are the solution shops that continuously shift the frontiers of the health systems towards better healthcare. They bundle a comparatively large number of patients including an even larger stock of complex care, biomedical research, education and training of professionals, and knowledge dissemination to other parts of the healthcare system. Considering their crucial position and their multiple tasks, we know surprisingly little on how they try to organise their operations. This is certainly the case in Europe where many different models of governance of AMCs co-exist. The many different and complex tasks might play a role in the governance and organisational structure of AMCs. Although Davies et al. concluded that the challenges related to governance and management of AMCs are very similar across the world [2], the vast majority of the literature (94.4%) nonetheless deals with governance of AMCs in the North American situation [3].

The first conceptual outlines of AMCs were already published in the Flexner Report (1910), based on the needed connection of three core tasks (patient care, education and research) [4]. However, and perceived by both internal and external developments, healthcare organisations need to review their governance and organisational structure [5-7].

Boards of AMCs are challenged by both internal and external factors when it comes to strategic changes in organisation. Not many research has been conducted on the governance of European AMCs. Governance stems from the Latin verb “gubernare”. This means literally steering (e.g. a vehicle). As a concept, governance is open to many different interpretations that have over the years appeared in literature [5, 6, 8-12]. In this study governance refers to leading an organisation from an embedded and underlying vision on how to organise strategic steering.

The main objective of this study is to provide a comparison of the governance models of European AMCs. Specific objectives are to provide (1) an overview

of how countries specifically define an AMC; (2) an inventory of their characteristics; (3) a comparison and analysis of their governance; and (4) an exploration by country experts of relevant trends and challenges.

2. METHODS

This research aims to increase the current knowledge on the governance of European AMCs. For this purpose, the available literature was reviewed and a questionnaire was developed to collect information from experts on the governance models of AMCs in order to explore similarities and differences. The governance models used in this article to assess the organisational form and relationship between an AMC and a medical school is based on the classification developed by Weiner et al. [13]. Weiner et al. introduce eight governance models based on a three-pillar framework that characterises the relationship between medical school and AMC. The three pillars indicate the extent to which 1) the clinical enterprise resembles an "organised delivery system", 2) the medical school organises and integrates the clinical practice activities of its faculty with other parts of the clinical enterprise, and 3) the authority of the chief academic officer/dean over the clinical enterprise. See supporting information file Weiner's typology.

Ten European countries were included (Cyprus, Czechia, Denmark, Germany, Italy, Latvia, Netherlands, Norway, Poland, and Spain), as well as Israel.

The questionnaire was designed firstly to take stock of the current governance and organisational structure, secondly to identify internal and external factors that may challenge the current governance and organisational structure and thirdly to identify expected trends in relation to governance and organisational structures. The initial questionnaire was developed by two authors (Ester Cardinaal and Heleen Duighuisen) and verified by two others (Daiga Behmane and Patrick Jeurissen). The questionnaire was then shared with the remaining authors and modified based on their feedback. The final questionnaire covered four parts: 1) AMC definitions, 2) general characteristics, 3) governance and organisational structure (including ownership, governing relationships, the role of the dean, internal and external challenges), and 4) future trends in organisational models. There were both open and close-ended questions. For the latter, a 5-level Likert scale was applied. See supporting information file Questionnaire overview.

The respondents to the questionnaire were purposively selected to provide a diverse and rich source of information and perspectives [14]. Respondents were chosen because of their expertise in the topic (e.g. researchers on health systems), the positions they occupy that are relevant to understand AMC (e.g. hospital managers, medicine professors) and willingness to participate. Leading experts were identified from the European Observatory on Health Systems and Policies' Health Systems and Policy Monitor (HSPM) network. This network is composed by experts with deep knowledge and insight into the organisation and policy processes of their national health system [15]. For each country, a leading expert became responsible for completing the questionnaire and to invite other experts to participate or to interview them. Thus, the number of participating experts varied per country. Questionnaires could be completed either in an online version or in an editable MS Word file. Data were collected between July and December 2020. The data from the questionnaires were uploaded into an MS Excel file. Quantitative data are summarised in tables, qualitative data were analysed thematically, using a deductive approach. The analysed data was then returned and verified several times by the leading experts in the different countries. This was done both by (bilateral) e-mail as well as in digital plenary sessions.

3. RESULTS

Twenty-nine experts from 11 countries participated in the survey. The total number of respondents varied from one in Cyprus, Czechia, Denmark, Italy, Latvia, and Norway; two in Germany, Poland, and Israel; six in Spain; and eight in The Netherlands.

3.1 Definition of AMC

In all countries studied, no standardised definition for an AMC exists. Different types of organisations link the three core functions of (1) patient care, (2) education/teaching activities and, (3) research (Table 1). Most countries use the term 'university hospital' to describe these institutions. However, numerous other hospital types fulfil these three functions as well, such as major regional hospitals in Denmark, several Polish research institutes, major (more than 500 beds) public and non-profit hospitals in Israel, or so-called top-clinical teaching hospitals in The Netherlands. In both Norway and Spain, all hospitals are obliged to fulfil these three functions, but specific 'university hospitals' cooperate with the university.

Table 1. Definition of AMCs or institutions with tripartite missions

Country	Definition
Cyprus	No AMCs as such; larger hospitals can perform the three functions in collaboration with medical schools; both private and public hospitals can be involved in training medical students.
Czechia	**Teaching hospitals** are owned by the state and subordinated to the Ministry of Health (and the Ministry of Defence – one hospital); to fulfil the teaching function, such a hospital must be affiliated with a medical school.
Denmark	**AMCs** provide tertiary care services. The provision of specialised and highly specialised services must integrate research and training; this includes both university hospitals and major regional hospitals.
Germany	Hospitals considered **AMCs** are mostly large tertiary hospitals that are part of a university's medical school or are closely affiliated, and most are publicly run by the corresponding university or state ('Bundesland'), a minority is publicly run by another party (e.g. the corresponding city) or a private entity.
Israel	Half (6 of 13) of general, public- and, non-profit hospitals with more than 500 beds can be considered **AMCs**; yet the balance among the functions can differ in specific units and according to their university affiliation.
Italy	**AMCs** are affiliated with faculties of medicine. Scientific Institutes for Research, Hospitalisation, and Healthcare have a tripartite mission, but it is not possible to achieve an academic career there.
Latvia	**University hospitals** are regulated by law: a multi-profile inpatient treatment institution that implements academic education and research programs and projects.
Netherlands	**University medical centres** (UMCs) are established and regulated by public law: they consist of a university hospital and a faculty of medicine (and often biomedical sciences). There also exist Top Clinical Teaching hospitals (STZ) that also have a tripartite mission (although not established under public law) but are considerably more focused on secondary patient care, and requires no legal relationship with a university.
Norway	All hospitals have four obligations imposed by law: to treat patients, to educate healthcare professionals, to do research, and to inform patients and relatives; the **university hospitals** have a particular legal obligation to cooperate with a defined university on research and educating medical students.
Poland	Two types of hospitals can be considered AMCs: **university hospitals** owned and run by medical universities and **research institutes** owned by the state and supervised by the Ministry of Health. The latter, although more focused on research, also provide tertiary patient care and teaching activities.
Spain	All public hospitals and some private hospitals aim for the tripartite mission; when a hospital has an agreement with a university, they can be called a 'Hospital Universitario' (**university hospital**).

*(1) patient care, (2) education, and (3) research

- For AMCs, the balance among patient care, research, and education differs: Patient care, although mostly focused on specialised, tertiary care, may also include primary and preventive care activities. Seven countries (Cyprus, Denmark, Germany, Latvia, the Netherlands, Poland, and Spain) indicate involvement of AMCs in 'primary care and prevention'. For example, in the Netherlands, Germany, and Poland, AMCs can be involved in and/or coordinate a variety of health promotion/public health programs. In, Spain, primary healthcare centres may also be formally considered as AMCs.
- Various forms of cooperation exist between the AMC and the university/ medical school. Teaching may cover mainly medical professionals or include other professionals (e.g. in biomedical and health sciences – in the Netherlands and Spain). 'Teaching hospitals' can be used for AMCs providing education for medical undergraduate students but also for those offering solely postgraduate speciality training (e.g. in Poland, Denmark, and Spain). Germany also has 'Akademische Lehrkrankenhäuser'. These are often smaller, e.g. secondary/tertiary care, hospitals that collaborate with medical schools to provide places for internships.
- Research activities are usually conducted in cooperation with a university and include translational and clinical studies. Some AMCs can have strong obligations to develop their research function, e.g. research institutes in Poland and The Netherlands; in Italy, some AMCs must perform research activities to maintain their recognition and receive funds, based on the scientific impact of their research production (measured through peer reviewed papers).

3.2 Characteristics: number of AMCs and representation

Due to a lack of standardised definitions, the quantitative data on the number of AMCs in the included countries must be analysed with caution.

Hospital doctors and medical school professors strongly disagree on how to manage academic facilities. Powerful trade unions of hospital doctors (public servants mainly) are facing the Ministry of Healthcare, medical schools, and the teaching staff.

Table 2. General overview of the number of AMCs (or institutions with tripartite missions) and medical schools per country*

Country	Number of AMCs	Number of medical schools
Cyprus	no data available**	3
Denmark	5	4
Czechia	10	10
Italy	51	42
Germany	36	36
Israel	6	6
Latvia	3	2
Netherlands	8	8
Norway	6	4
Poland	50	13
Spain	57	46

*respondents estimations as of 2019/2020
** For Cyprus, no data are available on the number of AMCs, beds, or undergraduate students.

Six out of 11 analysed countries (Czechia, Germany, Italy, Israel, Poland, and The Netherlands) indicated the existence of an umbrella organisation to provide coordination to, and represent the interests of their member AMCs. These include, e.g. Italy, where the Medical Directors Association and other associations from medical professional categories contribute to the strategy of AMCs; the union of hospital directors, a branch of the Israeli Medical Association, in Israel; the Union of Clinical Hospitals (*Polska Unia Szpitali Klinicznych*) gathering the majority of university hospitals in Poland; the Association of Hospitals of the Czech Republic (*Asociace nemocnic ČR*) in Czechia; or *the Nederlandse Federatie Universitair Medische Centra* in the Netherlands. The political role varies, from relatively strong in Israel and the Netherlands to more limited in Poland. In addition, there can be umbrella organisations for medical facilities that focus mainly on the educational and research functions, e.g. *Vereniging van Universiteiten* in The Netherlands.

3.3 Governance and organisation

Ownership structure of AMCs and medical schools

The majority of the countries have systems that include public, not-for-profit ownership for both AMCs and medical schools. Germany, Cyprus, and Spain

indicate that a small number of AMCs and medical schools are privately owned entities. In Poland, there exist a few private medical schools, yet no privately owned AMCs.

In Denmark, AMCs are organised by regional departments, whereas the universities are organised/governed by the state. In Norway, the medical schools are run by a different governmental department than the hospitals.

Table 3. Ownership of AMCs and medical faculties

Country	AMC public/ private	AMC profit/ non-profit	Medical faculty public/private	Medical school profit/non-profit
Cyprus	Both	both	both	both
Czechia	Public	non-profit	public	non-profit
Denmark	Public	non-profit	public	non-profit
Germany*	Public	non-profit	public	non-profit
Israel	Both	non-profit	public	non-profit
Italy	Both	non-profit	both	non-profit
Latvia	Public	non-profit	public	non-profit
Netherlands	both	non-profit	public	non-profit
Norway	public	non-profit	public	non-profit
Poland	public	non-profit	public/few private	non-profit
Spain	both	both	both	both

*The overwhelming majority of German AMCs are publicly run with a few exceptions. All exceptions are small facilities and are not considered 'full university medical facilities or AMC'.

Relationship between AMC and medical school

Respondents of the questionnaire were asked to compare their country's organisational form and relationship between AMCs and medical schools based on Weiner's typology [13]. Six of the eleven countries compared their organisational model with these classifications. Five countries were not able to label the situation for their country. Latvia and The Netherlands classified their system as Subsidiary (DEF); Italy as Alliance Leader (DEF); Spain and Poland as Alliance Partner (DEF); and Cyprus as Coalition Leader (DEF). These results point to the substantial differences in the relationships between AMCs and the universities in the European countries. This is also evident from the data in the open field of the questionnaire:

- Italy adds that the relationship between the academic authority and the clinical authority is very strong. Decision makers are mainly academics of the faculties of medicine. The administrations are separated, and report to the Ministry of Health or the Ministry of University and Research (research activities).
- In Poland all strategic decisions require consent from the owner (the university). However, since clinical activity gets most resources these interests hold strong informal say. Poland has no dedicated regulations for university hospitals, and thus from a legal point of view, they are treated as standard medical providers.
- In Spain medical school and clinical organisation belong to different institutions that are linked by an agreement that includes functional aspects of teaching and research. The medical school exercises relatively little authority in the management of the clinical enterprise.

Role of the dean

The position of the university in the network of relations is in many cases concentrated in the authority given to the dean. This varies significantly per country. In German and Dutch AMCs, the dean is embedded in the governance of the hospital: the dean participates in the AMC management board. In the Czecia, the dean appoints the chief clinicians, who report on educational aspects. The same holds for Israel, where some research collaborations establish joint research centres between universities and hospitals. In Latvia, the dean can operate in multiple functions for both the university as well as the hospital. In Norway and Spain, intermediating deputy deans take part as university representatives in hospital committees and meetings. In Italy, the dean oversees the strategy and organisation of the scientific departments of the faculty of medicine.

Internal challenges to governance

The inability to steer to rebalance the three core missions and the financial conflicts are considered the most challenging internal issues. Latvia and Poland consider financial conflicts among the three missions a major challenge, although in Czechia and Denmark this is not seen as a major challenge. Five countries scored moderate or high on the collision of cultures between medical and academic topics. Lack of strategic focus and inability to respond effectively to change were deemed major organisational challenges by five countries. Germany encounters problems because the majority of doctors are employed under the 'Wissenschaftszeitgesetz /Hochschulrahmengesetz,' which does not allow employment at academic hospitals for more than 15 years. Therefore,

many middle-career doctors have to look for positions outside AMCs, taking with them often valuable expertise. In The Netherlands, the position of the professional in an academic organisation where the focus lies more on the field of expertise than on the organisation's interests is considered to be challenging. Very similar in Latvia, the separation of training and healthcare processes has stimulated simultaneous employment of medical practitioners in AMCs and universities. In Czechia, simultaneous employment is also common and different remuneration schemes for university-employment and hospital-employment poses tensions because of different pay. Finally, Italy mentioned the low level of leadership skills and lack of systemic vision as main barriers for effective governance. Table 4 summarises the results.

External challenges to governance

Pressing challenges focus on financial sustainability and human resources. Nine countries see expensive technologies as a threat to the control of AMCs. Directly followed by human resource issues relating to workforce shortages of highly skilled staff (eight countries). Also country-specific external challenges were mentioned:

- A regionalised healthcare system (Italy).
- Unstable financing and regulation, lack of long-term planning, strong political involvement (Israel).
- Increasing cost of personnel and decreasing revenues, competition with other hospitals for public funds for research and education, and a discussion about the number of AMCs (The Netherlands).
- Political interference, bureaucratic regulation of personnel and Workers Union pressures and demands (Spain).
- Pressure to restructure because of an unstable financial situation, absence of regulation for university hospitals to control the high cost of teaching and tertiary care (Poland) [16, 17]
- Conflict about regulation and certification of medical professionals, training capacity suffering from serious shortages, lack of coherence between Ministry of Health and Ministry of Education regarding undergraduate and residency study places (Latvia).
- Problems regarding sustainability when academic hospitals employ more expensive diagnostic/therapeutic tools. The structure of reimbursements generates similar revenues independent whether treatment was delivered in a non-academic or academic hospital (Germany).

Table 5 summarises the results.

Table 4. Internal issues challenging the governance of AMC by country

Internal challenges	**Not at all**	**Slightly**
Cultural		
Clash of cultures between organisations		Czechia, Italy, the Netherlands, Norway, Poland
Collision of culture medical/academical		Czechia, Norway
Organisational		
Lack of strategic focus		the Netherlands
Lack of enterpreneurialism		Czechia, Latvia
Inflexibility	Italy	
Ability to respond effectively to change		
Ability to act collectively as a whole		Czechia, Denmark, Latvia
Multiple/conflicting tasks	Israel	Czechia, Italy, Norway
Relation between affiliates		Czechia, Israel, Latvia, the Netherlands
Financial		
Financing conflicts among three missions	Czechia, Denmark	
Leadership		
Leadership skills	Israel	Czechia, Norway, Poland

	Somewhat	Moderately	Extremely
	Denmark, Germany, Latvia, Spain	Israel	Cyprus
	Denmark, Israel, the Netherlands, Spain	Cyprus, Germany, Italy, Latvia, Poland	
	Czechia, Denmark, Germany, Latvia, Norway	Israel, Italy, Poland, Spain	Cyprus
	Cyprus, Denmark, Germany, Israel, Italy, the Netherlands, Norway	Poland, Spain	
	Czechia, Denmark, Germany, Latvia, the Netherlands	Cyprus, Israel, Norway, Spain	Poland
	Czechia, Denmark, Germany, Italy, Latvia, the Netherlands	Israel, Norway, Spain	Cyprus, Poland
	Cyprus, Germany, the Netherlands, Norway, Poland, Spain	Israel	Italy
	Denmark, Germany, the Netherlands, Spain	Latvia, Poland	Cyprus
	Denmark, Germany, Italy, Norway, Poland, Spain		Cyprus
	Italy, the Netherlands, Norway, Spain	Cyprus, Germany, Israel	Latvia, Poland
	Denmark, Germany, Latvia, the Netherlands, Spain	Cyprus, Italy	

Table 5. External issues challenging the governance of AMC by country

External challenges	Not at all	Slightly
Demographic		
Ageing population		Cyprus, Czechia, Latvia, Norway, Poland
Organisational		
Complexity of care		Czechia, Norway, Poland
Legislation		Germany, Norway
Financial sustainability		
Captial investment		Germany
Decreasing reimbursements	Cyprus, Czechia	Spain
Expensive technologies	Czechia	
Human resources		
Workforce shortages		
Shortages of highly skilled personnel	Czechia	
Provision of care		
Competition of other (private) hospitals/chains	Czechia, Denmark, Poland	Italy, Israel, Spain

	Somewhat	Moderately	Extremely
	Germany, the Netherlands, Spain	Denmark, Israel, Italy	
	Cyprus, Denmark, the Netherlands, Spain	Germany, Israel, Italy, Latvia	
	Czechia, Denmark, Israel, Latvia, the Netherlands, Spain	Italy	Cyprus, Poland
	Czechia, Denmark, the Netherlands	Cyprus, Poland, Spain	Israel, Italy, Latvia, Norway
	Denmark, Italy, the Netherlands		Gerany, Israel, Latvia, Norway, Poland
	Italy	Cyprus, Denmark, Germany, the Netherlands, Spain	Israel, Latvia, Norway, Poland
	Cyprus, Czechia, Denmark	Germany, Italy, the Netherlands, Norway, Poland, Spain	
	Cyprus, Denmark	Germany, Italy, Latvia, the Netherlands, Norway, Poland, Spain	
	Cyprus, Germany	Israel, the Netherlands	Norway

3.4 Future trends

Participants were asked to indicate how they see the future design of AMC governance. They were presented four models of integration of patient care, research, and education: 1) a more functionally integrated model 2) a less functionally integrated model 3) a more institutionally integrated model 4) a less institutionally integrated model. Eight out of eleven countries believe that the governance of their AMCs will evolve towards more functional integration with separate governing bodies and legal entities for the academic and clinical parts. The responses show that this is being driven at different levels and with different emphases.

Norway, Czechia, and Denmark mentioned no immediate changes and that patient care, research, and education will remain part of (highly) specialised services. In 2014, Czechia unsuccessfully sought to bring AMCs under the formal control of universities. The strengthening of highly specialised care concentration continues but is not limited to the teaching hospitals [18]. In Norway, the balance between hospitals and universities is considered adequate. Nevertheless, a shift towards more cooperation is to be foreseen. In the specific situation of Poland and Israel, it is expressed that movements to both a functionally as well as an institutionally integrated model belongs to the possibilities. In Poland, some mergers and/or organisational consolidations between university hospitals have taken place [16]. As the government proposes to push forward with overall hospital sector centralisation, further integration of highly specialised providers (including AMCs) can be expected. Israel designs a 'national master plan for the healthcare system 2048'. The plan covers the transformation of hospitals into 'comprehensive medical campi' with many different settings and services, where research and training are expanded and diversified. In Germany strategic goals for AMCs are set for more functionally integrated models of patient care, research, and education but no large reform plans concerning institutional changes are to be expected. Spain works on plans for hospitals and medical schools to improve quality of teaching, healthcare, and research, generating synergies that solve the needs of both institutions. The Netherlands and Poland predict growing institutionalisation of regional networks of care, research, and education (e.g. the oncological care network in Poland). Dutch AMCs move towards a less hierarchical organisational structure. Clustering departments must bring better alignment in strategy and policies. Integration and collaboration with other faculties will be more pronounced because of growing needs for interdisciplinary solutions. This

also applies to Latvia's strategy to develop joint supervision of medical education programs as well as strategies for cooperation between AMCs and universities.

4. DISCUSSION

This study confirms the conclusion of French et. al [3] that there is no universal or even European definition of an AMC. This study shows that organisational types, contents and legal frameworks of the collaboration between faculty and hospitals do vary substantially. It is likely that such differences do relate to the design of the regional and national healthcare systems. The question arises whether we can - at all - speak in a general sense about academic medical centres at the European level?

This study shows that the linkage of (complex) patient care, research and education in AMCs is rather loose in a number of European countries and that, from the perspective of the governance of such institutions, there are considerable differences and varieties. There is no common definition, but typically the three core functions are (loosely) coupled. A main differentiator is the formal level of integration between hospital and medical school. This can be complete, such as in The Netherlands, but typically is on a more horizontal footing with a strong position of the university. In some countries, the resulting dual employment (e.g. as a doctor in the hospital and as a lecturer at the university/faculty) seems to be a common source of tension. The threshold for becoming an AMC also varies from country to country, with Spain appearing to be a country with a slightly lower threshold. Hospital-university relations are different, but almost all of these institutions are owned by the government or by a non-profit organisation, which increases political influence.

Although this study revealed substantial differences in the organisation and governance of AMCs, institutions face comparable challenges[19-22]. Major challenges that have emerged from this study range from staff shortages, changing patient populations and financial pressures, including new treatments and technologies. Solutions might include new organisational structures and collaborations. Raus et al. [23] hypothesize that the current model mainly results from gradual institutionalisation of the academic

mission within university hospitals. Most experts in this study see further functional integration as the most logical way forward.

Strengths and limitations

To the best of the researchers' knowledge, this is the first study that provides an international comparison of AMC organisation and governance. The main limitation of the study is that the general and very open-ended nature of the questionnaire makes it difficult to differentiate between countries on common themes. In line with this, it can be noted that each expert has formed his or her individual judgement with regard to the national organisation model in relation to the classification of Weiner et al. [13]. Another limitation is that only a limited number of countries were included in this comparison. Furthermore, when answering the questions, respondents had an "average" AMC of their country in mind. This means that the results from this study cannot be applied on a one-to-one basis to all AMCs in a specific country. This puts some limits to the general applicability of the findings. In order to generalise and thus strengthen the results, robust follow-up studies are needed, for which this study can serve as a basis.

5. CONCLUSIONS

This exploratory study provides the first international comparison of the organisation and governance models of AMCs. The study reveals a lack of standardised definitions of AMCs and substantial differences in the way medical schools and universities organise their relationships under the umbrella of an AMC. Nevertheless, most of the respondents agree that further functional integration is the logical way forward. Depending on the country, the balance among the three core functions of patient treatment, research, and education can also differ. Most participating countries have systems that include public, not-for-profit ownership for both AMCs and medical schools. The main internal challenges focus on inability to respond to change and the ongoing financial conflicts between the three core tasks. Important external challenges relate to financial sustainability and shortages of staff. Further research on these important institutions is warranted. The variety implies that both policy makers and administrators of AMCs can tap for exercises on mutual learning. More than 100 years ago, Flexner encouraged AMCs to learn by going about: "*ambulando discimus*") [4]. Today, the need and desire to learn from each other is as timely as ever [24].

References

1. McKee M, Merkur S, Edwards N, Nolte E, North J. The Changing Role of the Hospital in European Health Systems2020. 1-305 p.
2. Davies SM, Tawfik-Shukor A, de Jonge B. Structure, Governance, and Organizational Dynamics of University Medical Centers in the Netherlands. Academic Medicine. 2010;85(6):1091-7.
3. French CE, Ferlie E, Fulop NJ. The international spread of Academic Health Science Centres: a scoping review and the case of policy transfer to England. Health Policy. 2014;117(3):382-91.
4. Flexner A. Flexner Report. 1910.
5. Durán A, Wright S. Understanding hospitals in changing health systems. In: Understanding Hospitals in Changing Health Systems. Cham: Palgrave Macmillan, 2020. doi:10.1007/978-3-030-28172-4.
6. Chari Ramya R. Governing Academic Medical Center Systems: Evaluating and Choosing Among Alternative Governance Approaches. Academic medicine : journal of the Association of American Medical Colleges. 2018;93(2):192-8.
7. Institute of M. Academic health centers: leading change in the 21st century. Acad Emerg Med. 2004;11(7):802-6.
8. Lee PR. A tiger by the tail: the governance of the academic health sciences center. J Med Educ. 1973;48(1):27-39.
9. Allison RF, Dalston JW. Governance of university-owned teaching hospitals. Inquiry. 1982;19(1):3-17.
10. Weisbord MR, Lawrence PR, Charns MP. Three dilemmas of academic medical centers. J Appl Behav Sci. 1978;14(3):284-304.
11. Hastings DA, Crispell KR. Policy-making and governance in academic health centers. J Med Educ. 1980;55(4):325-32.
12. Culbertson RAR. Organizational models of medical school relationships to the clinical enterprise. Academic Medicine. 1996;71(11):1258-74.
13. Weiner B, Culbertson R, Jones R, Dickler R. Organizational Models for Medical School—Clinical Enterprise Relationships. Academic medicine : journal of the Association of American Medical Colleges. 2001;76:113-24.
14. Etikan I. Comparison of Convenience Sampling and Purposive Sampling. American Journal of Theoretical and Applied Statistics. 2016;5:1.
15. European Health Observatory. Health Systems and Policy Monitor. [Internet]. Available from: https://eurohealthobservatory.who.int/monitors/health-systems-monitor/overview. [Last accessed 2024-03-31].
16. Dubas-Jakobczyk K, Domagala A, Kiedik D, Pena-Sanchez JN. Exploring Satisfaction and Migration Intentions of Physicians in Three University Hospitals in Poland. Int J Environ Res Public Health. 2019;17(1).
17. Dubas-Jakóbczyk K, Kocot E, Kozieł A. Financial Performance of Public Hospitals: A Cross-Sectional Study among Polish Providers. Int J Environ Res Public Health. 2020;17(7).
18. Bryndova L, Bar M, Herzig R, Mikulik R, Neumann J, Sanak D, et al. Concentrating stroke care provision in the Czech Republic: The establishment of Stroke Centres in 2011 has led to improved outcomes. Health Policy. 2021;125(4):520-5.

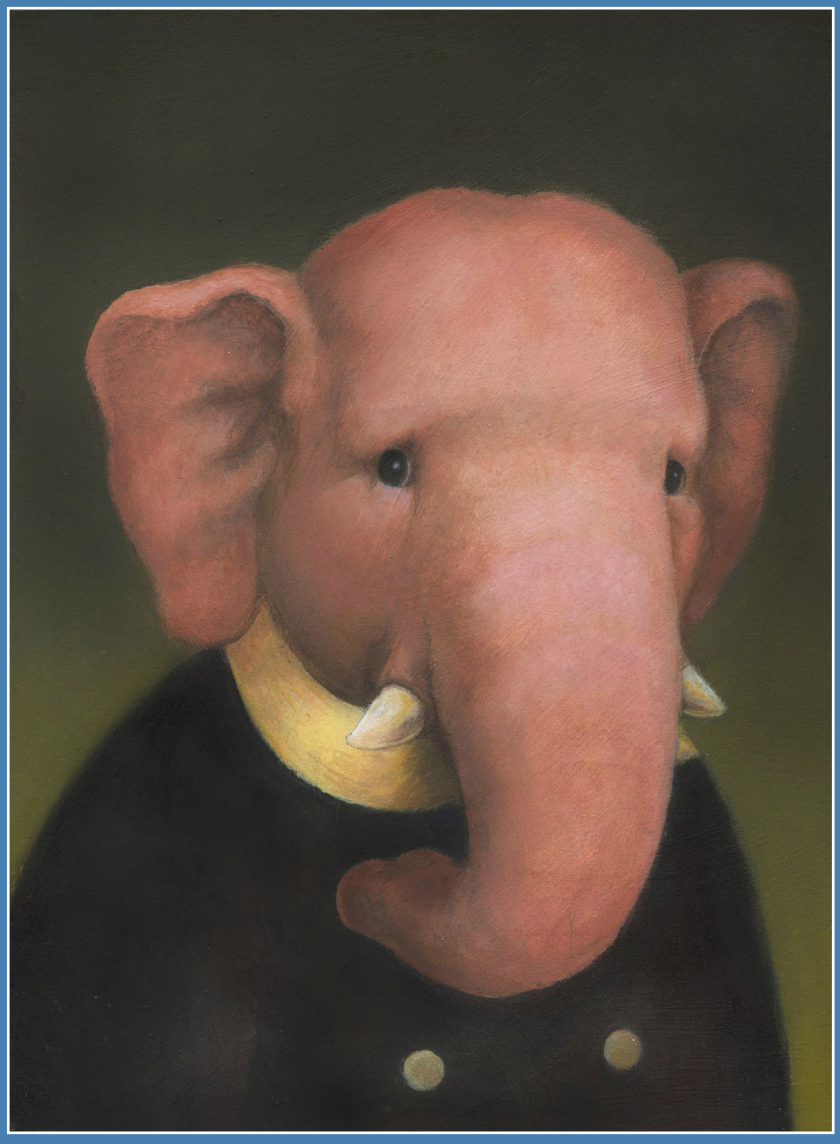
19. Weidner W, Steinmann I. [Privatization of university hospitals. A promising option?: Giessen's experience from the viewpoint of research and teaching]. Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz. 2009;52(9):904-9.
20. Grover A, Slavin PL, Willson P. The economics of academic medical centers. N Engl J Med. 2014;370(25):2360-2.
21. Rich EC, Liebow M, Srinivasan M, Parish D, Wolliscroft JO, Fein O, et al. Medicare financing of graduate medical education. J Gen Intern Med. 2002;17(4):283-92.
22. Alberts B, Kirschner MW, Tilghman S, Varmus H. Rescuing US biomedical research from its systemic flaws. Proc Natl Acad Sci U S A. 2014;111(16):5773-7.
23. Raus K, Mortier E, Eeckloo K. Past, present and future of university hospitals: Taylor & Francis; 2020 2020/05/03. 177-84 p.
24. Ovseiko PV, Davies SM, Buchan AM. Organizational models of emerging academic health science centers in England. Acad Med. 2010;85(8):1282-9.

Supporting information

Available from:

Governance of academic medical centres in changing healthcare systems: An international comparison - ScienceDirect

- Questionnaire overview
- Weiner's typology



Chapter 4

Use of business model potential in Dutch academic medical centres – A case study

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ABSTRACT

Academic Medical Centres (AMCs) are large organisations with a complex structure due to various intertwined missions and (public) roles that can be conflicting. This complexity makes it difficult to adapt to changing circumstances. The literature points to the use of business models to address such challenges. A business model describes the resources, processes, and cost assumptions that an organisation makes in order to the delivery of a unique value proposition to a customer/patient. Do AMC business operations managers actually use business models to address challenges and operate in a way that enables AMCs to adapt to changing circumstances? This study explored whether the use of a business model is a starting point for bringing about change in AMC operations. A case study design was considered appropriate to explore the knowledge and experience of business models among business operations managers of Dutch AMCs. Through purposive sampling, participants were invited to participate in a questionnaire to provide in-depth and detailed information about the use of business models in AMCs.

This research showed that a business model can support the complex organisation of an AMC, but the design and use of business models varies. In general, respondents attribute more potential to the use of a business model than they experience in daily practice. The majority consider a business model to be suitable for bringing about change, but see it only sparingly used in their own AMC. This is the first study to provide some initial insights into the use of business models in Dutch AMCs. This suggests that improvements can be made to optimise the potential for changing business models in AMCs worldwide. In order to successfully implement an innovative business model, the interpretation of the concept of a business model and the creation of a framework of preconditions should be taken into account. Healthcare providers, policy makers or researchers should explicitly identify the environment in which the model will operate. In particular, by identifying the level of readiness for change readiness at all levels of the organisation.

1. INTRODUCTION

Academic medical centres (AMCs) are large hospital organisations that combine highly complex patient care, biomedical research, and training and education [1]. An international comparison showed that European AMCs face significant challenges, including staff shortages and ongoing internal tensions regarding the allocation of financial resources between patient care, research and education [2]. The literature increasingly points to the added value of business models to address such challenges [3]. A business model describes the resources, processes and cost assumptions that an organisation makes to deliver a unique value proposition to a customer/patient [4]. From this perspective, changing one or more components of a business model can potentially lead to change. However, the complexity of AMCs makes it difficult for them to adapt to changing circumstances. Wietecha et al. conclude that the governance of AMCs is complicated by the simultaneously of multiple business models: "*The AMC is not a 'three-legged stool' of patient care, research and teaching – a metaphor implying greater similarity of purpose functioning and financing than is the case. The 'legs' of that stool are distinct and all different business models*". Wietecha et al. state that AMCs can only be successful if they use several multiple business models simultaneously [5]. However, little is generally known about the use of business models by business operation managers of AMCs [6]. More specifically, little is known about the use of business models in AMCs to address contemporary challenges.

This study seeks to explore whether the concept of a business model is recognized, valued, used and applied as such by AMC business operations managers. And, whether a business model is used as a tool to initiate change.

2. THEORETICAL BACKGROUND

2.1 Dutch academic medical centres

The Netherlands has developed different hospital services for its 17,6 million inhabitants: 1) academic medical centres, 2) top clinical hospitals and, 3) general hospitals. AMCs are large hospitals that provide a significant amount of highly specialised care and have a leading position in tertiary patient care, biomedical scientific research, knowledge development and innovation. The seven Dutch AMCs employ more than 80,000 people, have

a combined annual turnover of more than 10 billion euros and treat about 1.2 million patients a year. Top clinical hospitals provide primary care but as well as care that requires specific specialised facilities. Most top clinical hospitals work in collaboration with other hospitals. They also provide training for medical specialists and are often involved in scientific research. General hospitals are regional hospitals that provide mainly primary care and are relatively small, so they do not usually have specialist teams for many types of illness. Around these hospital groups, the landscape also includes outpatient clinics, specialist hospitals, and independent treatment centres. AMCs differ from other Dutch hospitals in a number of ways. Firstly, AMCs are expected to provide a certain level of basic care that supports the educational objectives. The extent to which this is done varies and also depends on the regional context. Second, the large amount of complex tertiary patient care. Thirdly, the AMCs have been entrusted with public tasks as defined in the Higher Education and Scientific Research Act ("Wet op het hoger Onderwijs en wetenschappelijk Onderzoek"). The AMCs receive specific funding for the performance of these public tasks. The AMCs also receive funding for continuing medical education and hospital training courses.

2.2 Business models

In 1957, Bellman et. al introduced a business model to represent reality in a model [7]. Da Silva et. al outline the historical perspective of business model development. They note that the term was not widely used for decades. It was not until the 1990s that there was a renewed interest in business models. With the advent of the Internet, there was a need to organise business differently. The use of bespoke business models was seen as a means of shaping new ways of running Internet businesses [8]. According to Wirtz et al, a business model is a simplified and aggregated representation of the relevant activities of a company [9]. Wirtz identifies a number of components relevant to a business model, including strategy, resources, network relationships, customers, value proposition, revenues and value-creating activities. These components are the basis for the questionnaire.

2.3 Business model innovation in healthcare

Nowadays, the term business model is regularly used in the academic literature, often in combination with innovation or disruptive innovation. Business model innovation is seen as the need to arrive at a new value proposition in response to changing circumstances [3]. Business model

innovation is critical to a firm's ability to achieve growth and long-term viability [10]. Research shows that financially successful companies value business model innovation twice as much as less successful companies, indicating the potential benefits of explicitly using new business models to anticipate change [9]. To understand the concept of business models in the hospital sector, a literature review was conducted by Lopes et al. [11]. They state that a business model: "*helps to describe, analyse, manage, and communicate: (i) the value proposition of the hospital for its patients and the other stakeholders; (ii) the ways in which the organisation creates and delivers this value; and (iii) the economic value required to maintain or to regenerate the environmental, technical, and legal capital, together with the strategies of its organisational boundaries*". The dynamic aspects, the high degree of regulation and the large number of actors in health care are seen as complicating factors for business model innovation. However, empirical research shows that innovation in healthcare can be successfully achieved through the application of business models. For example, a study of healthcare innovation in Indian (teaching) hospitals found that one hospital specialising in cataract surgery had developed a business model whereby paying patients generated enough cash flow to offer free surgery to less well-off patients [12-13].

3. METHODOLOGY

The aim of this study was to increase the current knowledge about the use of business models in Dutch AMCs. Wirtz et al. defined a business model as a simplified and aggregated representation of the relevant activities of a company [9]. They defined a number of components that, in their view, characterise a business model. These include strategy, resources, network relationships, customers, value proposition, revenues and value-creating activities. The framework of the questionnaire is based on these elements. The initial questionnaire was developed by two authors (Ester Cardinaal and Joey Truijens). This questionnaire was piloted with two AMC business operations experts. Based on their feedback minor adjustments were made to the wording of the questions (see supporting information file Questionnaire overview). Finally, the questionnaire was reviewed by two expert authors (Hubert Berden and Patrick Jeurissen). It was considered appropriate to use a questionnaire to ask business operations managers of all AMCs in the Netherlands about their knowledge and experience with business models.

This is partly because it is an exploratory study on a topic on which little research has been done, and partly because business operations managers work across departments to align teams, set goals, implement initiatives and improve processes - helping the organisation to run efficiently and effectively.

The Research Ethics Committee of Radboud University Nijmegen Medical Centre, the Netherlands, confirmed that the above study was conducted out in accordance with the applicable legislation regarding review by an accredited research ethics committee such as the Medical Research involving Human Subjects Act and the Medical Treatment Contracts Act (file number 2022-15824). The Research Ethics Committee of the Medical Center of Radboud University Nijmegen approved the study.

3.1 Data collection

To the best of the researchers' knowledge, little research has been done on this topic. This study is one of the first explorations in this area. It was not intended to include all perspectives (stakeholders) in the study. Therefore, a small research population was chosen. The data was collected using purposive sampling [14]. At least one respondent was included from each AMC. To be included, the respondent had to hold a key position with oversight, experience and executive responsibility for business management operations. The choice of this sample is based on the assumption that business operations managers can be reliable sources of information about their use of business models [15]. The researchers agree that the exploratory research objective has been met now that at least one or more respondents from each Dutch AMC have been included in the study. A total of 31 respondents were invited, of whom 24 completed the questionnaire (see supporting information file Respondents). To ensure that all participants had the same level of knowledge about business models, background information was provided prior to the questionnaire (see supporting information file Questionnaire overview).

Informed consent was incorporated into the digital questionnaire. The first question of the questionnaire concerned the consent statement (see supporting information file Questionnaire overview). The consent form was digitally processed and recorded. A Limesurvey questionnaire (online) was administered. Data were collected between June 2021 and June 2022.

3.2 Analysis

The questionnaire consisted of two parts each with six questions. The questions were the same in both parts, but had to be answered in a different context. The first context concerned the use of a business model in a general sense. The second context concerned the actual use of a business model in the respondent's daily practice. Pre-structured options were offered for 10 questions. The remaining two questions could be answered on a 5-point Likert scale (strongly agree - strongly disagree). To avoid the bias inherent in this design, each question offered an alternative answer or a brief explanation. The data from the questionnaires were uploaded into an Excel file. A senior researcher from IQ Healthcare at Radboud University Medical Centre in Nijmegen performed statistical analysis using IBM SPSS Statistics for Windows, version 25. This analysis produced frequency tables consisting of four columns: 1) absolute frequency, 2) relative frequency 3) validity percentage 4) cumulative percentage. The absolute frequency describes the number of times a particular value for a data item was observed. The second column expresses as a percentage how often a particular value for a variable (data item) was observed in relation to the total number of values for that variable. The relative frequency is calculated by dividing the absolute frequency by the total number of values for the variable. The data in the third and fourth columns were used for verification purposes only. The third column indicates which data items are valid and therefore useful for analysis. The fourth column adds up the percentages. The data from the first tables were presented graphically in bar charts (see Figs 1 and 2). The analysis focused on the perceived difference between the applicability of a business model in a general sense and its actual application in the respondents' organisations. In other words, question 1 from part I was contrasted with question 8 from part II, question 2 with question 9, and so on. Differences were expressed in both numbers of responses and percentages. The interpretation of the results was carried out by two authors (Ester Cardinaal and Joey Truijens) and verified by two other authors (Patrick Jeurissen and Bart Berden).

4. RESULTS

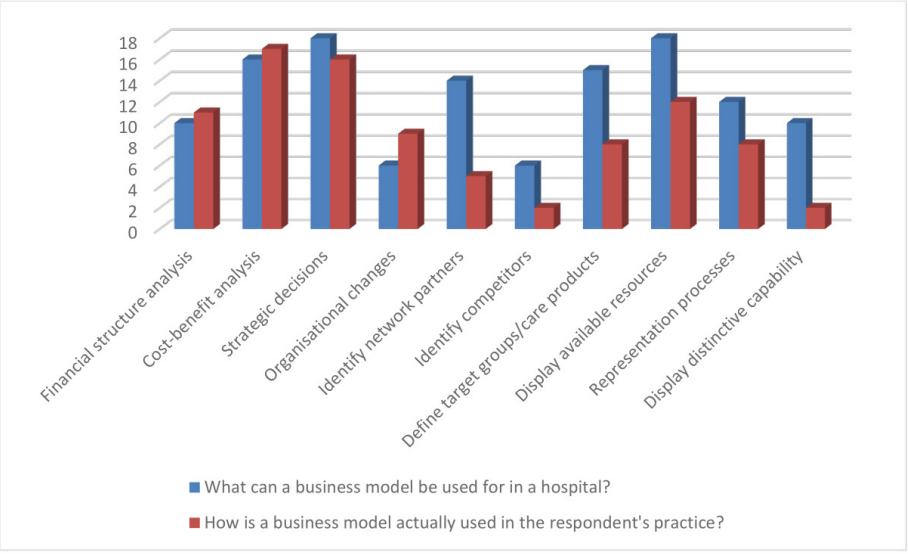
Respondents recognise that a business model can support the complex management of an AMC, but the design and use of business models varies. In general, respondents see more potential in the use of a business model than they experience in day-to-day practice. The majority consider a business

model to be suitable for bringing about change, but see it used only sparingly used in their own AMC.

4.1.1 *Use of a business model*

Differences between the general perception of a business model and daily practice can be found in the areas of network partners, competitors, target groups/care products, processes and distinctive capacity. Respondents are less likely to see these components in their own practice, whereas they believe that a business model can make a positive contribution to these issues. 18 Respondents (75%) indicate that a business model can be used to make strategic decisions. Respondents also indicate that they see a role for business models in value creation and strategic workforce planning. See Fig 1.

Figure 1 Use of a business model



4.1.2 *Multiple business models in an AMC*

22 respondents (91,7%) believe that it is possible to use multiple business models simultaneously within an organisation; 20 respondents (83.3%) see this in their own AMC. Multiple business models are interpreted in different ways: Six respondents (25%) say that the business model of the hospital is different from that of a department. Business models may also differ within departments, for example, to a greater of lesser extent externally focused.

Only four respondents (17%) mention the use of multiple business models in relation to the different missions (patient care, research, education). Three respondents (12.5%) are critical of the use of multiple business models within an organisation. Reasons for this criticism vary from not desirable to not in the hospital's interest or not in the department's interest. Two respondents (8.3%) link different care models (acute, diagnostic, treatment, chronic) to the concept of a business model.

4.1.3 Supporting aspects of business models

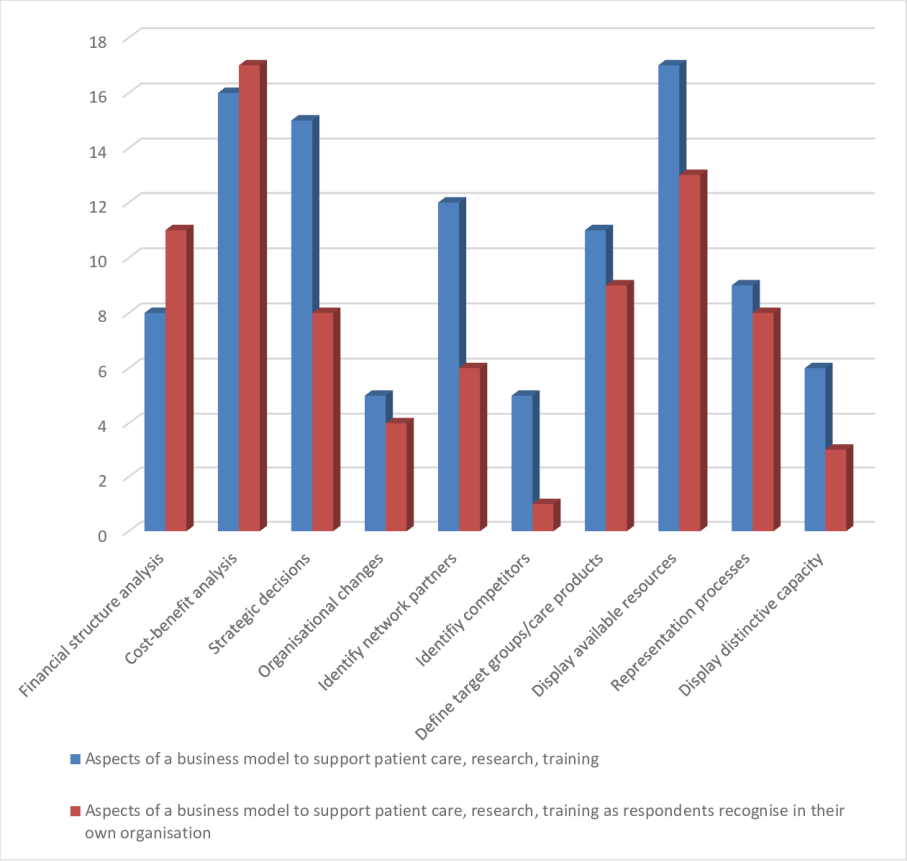
Availability of resource (17 respondents, 70.8%), cost-benefit analysis (16 respondents, 66.7%), strategic decisions (15 respondents, 62.5%) and identification of network partners (12 respondents, 50%) are the most frequently mentioned elements of a business model that could support patient care, education, training and research.

However, respondents see the use of a business model mainly to support cost-benefit analysis (17 respondents, 70.8%) and the financial structure analysis (11 respondents, 45.8%). For the latter, they say that it is important for transparency of financial flows, but less so for operational excellence. Cost-benefit analysis is seen by most as a tool for making decisions in the context of actual operations. The opposite is felt for elements of strategic decision making, identification of network partners and available resources. 12 respondents consider the identification of network partners (50%) to be important in achieving patient-centred and integrated care. They consider strategic decision-making (15 respondents, 62.5%) necessary to set priorities and provide direction and guidance. They see the mapping of available resources (17 respondents, 70.8%) as necessary to manage and optimise operations through capacity planning. However, they see these elements less reflected in business models in their daily practice. See Fig 2.

4.1.4 A business model as a tool for change

23 respondents (95.8%) consider a business model an appropriate tool for change, but only 15 respondents (62.5%) see this reflected in their daily practice. Eight respondents (33.3%) indicate that business models are used to a very limited extent. A business model is mainly used for measuring key performance indicators, portfolio selection and cost-benefit analysis.

Figure 2 Aspects of a business model that support patient care, research and education



4.2.5 *Using a business model to address current challenges*

Most respondents indicated that they would use a business model to address challenges related to the ageing of the patient population, the emergence of medical technology, the shifting boundaries between primary, secondary and tertiary care, the emergence of preventive care, rising health care costs, research funding, tensions over resource allocation between core functions and labour market issues. Some respondents cautioned against using a business model to solve too many challenges at once.

5. DISCUSSION

5.1 Summary of findings

Participants in the research recognised that a business model can support the complex management of an AMC. However, this research also shows that the design, use and understanding of business models varies from respondent to respondent. In addition, the respondents generally attribute more capabilities to the use of a business model than they experience in day-to-day practice. Specifically, the majority of respondents believe that a business model is capable of bringing about change, but see it used sparingly in their own AMCs. In conclusion, this research shows that business models are often perceived as too abstract in Dutch AMCs and are mainly used as a tool, especially for cost-benefit analysis, rather than as a means to bring about change to meet current internal and external challenges.

5.2 The context

The Dutch hospital landscape is characterised by a certain degree of stratification. AMCs are the largest hospitals with a leading position in tertiary highly complex patient care, biomedical scientific research, knowledge development and innovation. There are also large top clinical hospitals, which provide specialised care in addition to primary care and often have partnerships with other hospitals, including in the areas of physician training and scientific research. General hospitals are relatively small hospitals with a regional function that mainly provide primary care [16]. Finally, the Dutch hospital landscape includes smaller hospital organisations, including outpatient clinics, categorical hospitals that focus on a specific population group or disease and independent clinics for private, specialised medical care [17].

According to the Minister of Health, AMCs are unique in the Dutch health care system because they have been assigned public functions by law for which they receive specific funding [18]. This specific funding comes with both rights and obligations. Since the establishment of AMCs, politicians and other stakeholders have continued to debate this exceptional status of AMCs and their efficiency and transparency. In addition to these national pressures on the Dutch AMCs, they also have to deal with the global changes in supply and demand for health care. University hospitals are finding it increasingly difficult to maintain their current operations. An international comparison of 11 European AMCs shows that AMCs face significant challenges such as

disruptive external pressures and ongoing financial conflicts between their patient care, research and teaching missions [2].

The literature increasingly points to the use of innovative business models to address these challenges [19-20]. This makes the use of a business model potentially an important pillar for the management of AMCs. This was recently confirmed by IJntema et al. [21]. Their study shows that organisations achieve better performance in a changing environment by using a business model.

AMCs are large hospital organisations with complex structures due to the intertwining of missions, services and public functions [1, 5, 9]. Or as Peter Drucker once said: "*Even small healthcare institutions are complex, almost unmanageable places... Large health care institutions may be the most complex organisations in human history*" [1]. To successfully manage this complexity, these organisations are forced to use multiple business models simultaneously [5, 8, 22]. However, current AMC business models are based on a 19th century model [23]. At present, a variety of internal and external circumstances, challenges and objectives are forcing AMCs to rethink and adapt their operations [6, 24-25]. In this context, Johansen et. al state that a fundamental change or transition is needed [26]. Hwang and Christensen urge the healthcare sector to think about business model innovation in order to reap the benefits of disruptive innovation [27]. However, there are few examples of disruptive process innovation in healthcare [26, 28], and the positive effects of such innovation often do not materialise in hospitals [29-31].

5.3 Barriers and challenges

From the results of this study, some explanations can be derived as to why there are so few examples of disruptive innovation and disruptive business models in Dutch AMCs. First, it could be due to a lack of in-depth knowledge about the adoption and implementation of business models. In a recent study by Kok et al. on attributes that contribute to the learning and improvement capacity of healthcare organisations, they note that what they call hardware elements (such as capacity management, resources and infrastructure) can facilitate change, but not initiate it [32]. Change also requires what they call software elements (such as psychological and social processes). It is conceivable that a business model alone (hardware) will not initiate change without sufficient attention to the organisation's readiness to change (software). Along the same lines, the research of van den Hoed et al. adds

four factors that contribute to change readiness in healthcare organisations 1) strategic direction 2) climate 3) leadership and 4) commitment to innovation [33]. It is plausible that the absence of these four factors hinders successful business model adoption. Secondly, the results of the study show that business models are not always understood in the same way and that business models are not always used in the same way and for the same purposes. This obviously complicates a collaborative approach to change in the care chain or within a single AMC where multiple business models are being implemented simultaneously [9]. In the IJntema study mentioned above, Dutch managers experience and emphasise the importance of using the same business model in the care chain to achieve and maintain better performance. At the same time, however, they note that this still varies widely in practice [21]. Finally, a European comparison of AMC governance has shown that AMCs struggle to adapt to changing circumstances [2]. A Dutch study found that this is (partly) due to the fact that working with (in) these large organisations is severely hampered by organisational complexity, lack of mutual trust and common interests, and perverse systemic incentives [34]. As noted in the study by van den Hoed et al. there are preconditions for the successful implementation of innovative business models [33].

Although the majority of business managers believe that the use of a business model can contribute to solving their current challenges and agree that it can be used as a tool to initiate change, the above obstacles can be seen as serious barriers to the successful implementation of disruptive or innovative business models.

5.4 Strengths and limitations

To the best of the researchers' knowledge, this is the first study to provide exploratory insights into the use of business models in AMCs. All Dutch AMCs were represented, but in some cases only one person responded. Given the limited sample size, the generalisability of the results must be carefully considered [35]. In this study, sample size and data saturation are considered from the perspective that they should be operationalised in a way that is consistent with the exploratory research question [36]. This research is an exploratory study of the use of business models in AMCs. The aim is to use the exploratory findings to conduct more robust research. Future research on this topic could include a larger and more diverse sample of participants.

5.5 Implications

This research has provided a first insight into the use of business models in Dutch AMCs. This research shows that the use of business models in the healthcare sector in general and in AMCs in particular is topical, but that the topic has not yet been fully explored. It can be assumed that there is room for improvement in terms of the optimisation of the potential for change in the business models of AMCs worldwide. Before implementing an innovative business model, it is advisable for health care practitioners, policy makers or researchers to explicitly identify the environment in which the model will operate. In particular, it is important to ensure that the model is unambiguously interpreted. Work with collaborators to establish a clear starting point and definition. Then map readiness for change at all levels of the organisation (strategy, leadership, safety, commitment). If these factors are addressed, there may be fertile ground for the successful adoption of an innovative business model.

References

1. Drucker PF. The post-capitalist executive. Interview by T George Harris. Harv Bus Rev. 1993;71(3):114-22.
2. Cardinaal E, Dubas-Jakobczyk K, Behmane D, Bryndova L, Cascini F, Duighuisen H, et al. Governance of academic medical centres in changing healthcare systems: An international comparison. Health Policy. 2022.
3. Christensen CM. The innovator's prescription : a disruptive solution for health care: New York : McGraw-Hill, [2009] ©2009; 2009.
4. Sharan AD, Schroeder GD, West ME, Vaccaro AR. Understanding Business Models in Health Care. Clin Spine Surg. 2016;29(4):158-60.
5. Wietecha M, Lipstein SH, Rabkin MT. Governance of the academic health center: striking the balance between service and scholarship. Acad Med. 2009;84(2):170-6.
6. Durán A, Wright S. Understanding hospitals in changing health systems. In: Understanding Hospitals in Changing Health Systems. Cham: Palgrave Macmillan, 2020. doi:10.1007/978-3-030-28172-4.
7. Bellman R, Clark CE, Malcolm DG, Craft CJ, Ricciardi FM. On the Construction of a Multi-Stage, Multi-Person Business Game. Oper Res. 1957;5(4):469-503.
8. DaSilva CM, Trkman P. Business Model: What It Is and What It Is Not. Long Range Plann. 2014;47(6):379-89-89.
9. Wirtz BW, Pistoia A, Ullrich S, Gottel V. Business Models: Origin, Development and Future Research Perspectives. Long Range Plann. 2016;49(1):36-54.
10. Keiningham T, Aksoy L, Bruce HL, Cadet F, Clennell N, Hodgkinson IR, et al. Customer experience driven business model innovation. Journal of Business Research. 2020;116:431-40.
11. Lopes CM, Scavarda AJ, Vaccaro GLR, Pohlmann CR, Korzenowski AL. Perspective of Business Models and Innovation for Sustainability Transition in Hospitals. Sustainability-Basel. 2019;11(1).
12. Govindarajan V, Ramamurti R. Delivering World-Class Health Care, Affordably. Harvard Business Review. 2013;91(11):117-+.
13. Velamuri SR, Anant P, Kumar V. Doing Well to Do Good: Business Model Innovation for Social Healthcare. Adv Strateg Manage. 2015;33:281-308.
14. Etikan I. Comparison of Convenience Sampling and Purposive Sampling. American Journal of Theoretical and Applied Statistics. 2016;5:1.
15. Snihur Y, Wiklund J. Searching for innovation: Product, process, and business model innovations and search behavior in established firms. Long Range Plann. 2019;52(3):305-25.
16. Nederlandse Federatie Kankerpatiënten Organisatie 2022. [Internet]. Available from: https://nfk.nl/themas/ziekenhuiskeuze/hoe-ga-je-naar-een-ander-ziekenhuis/soortenziekenhuizen. [Last accessed 2024-03-31].
17. Informatie over volksgezondheid en zorg. [Internet]. Available from: https:// www.volksgezondheidenzorg.info/onderwerp/ziekenhuiszorg/cijfers-context/aanbod#nodeaantal-instellingen-voor-medisch-specialistische-zorg. [Last accessed 2024-03-31].
18. Beschikbaarheidsbijdrage Medische Vervolgopleidingen.[Internet] Available from: https://puc.overheid.nl/nza/doc/PUC_745144_22/. [Last accessed 2024-03-31].
19. Rich EC, Liebow M, Srinivasan M, Parish D, Wolliscroft JO, Fein O, et al. Medicare financing of graduate medical education. J Gen Intern Med. 2002;17(4):283-92.

20. Bowman MA, Rubenstein AH, Levine AS. Clinical revenue investment in biomedical research: lessons from two academic medical centers. JAMA. 2007;297(22):2521-4.
21. IJntema R, Barten DJ, Duits H, Tjemkes B, Veenhof C. Building and changing business models: a qualitative study among Dutch physiotherapy primary healthcare organisations. Prim Health Care Res Dev. 2022;23:e19.
22. Castano R. Towards a framework for business model innovation in health care delivery in developing countries. BMC Med. 2014;12:233.
23. Duffy TP. The Flexner Report--100 years later. Yale J Biol Med. 2011;84(3):269-76.
24. Chari Ramya R. Governing Academic Medical Center Systems: Evaluating and Choosing Among Alternative Governance Approaches. Academic medicine : journal of the Association of American Medical Colleges. 2018;93(2):192-8.
25. Institute of M. Academic health centers: leading change in the 21st century. Acad Emerg Med. 2004;11(7):802-6.
26. Johansen F, Loorbach D, Stoopendaal A. Exploring a transition in Dutch healthcare. J Health Organ Manag. 2018;32(7):875-90.
27. Hwang J, Christensen CM. Disruptive innovation in health care delivery: a framework for business-model innovation. Health Aff (Millwood). 2008;27(5):1329-35.
28. Blumenthal D, Campbell EG, Weissman JS. The social missions of academic health centers. N Engl J Med. 1997;337(21):1550-3.
29. Zulick L. Changes in Quality of Care after Hospital Mergers and Acquisitions. N Engl J Med. 2020;382(19):1867.
30. Kristensen T, Bogetoft P, Pedersen KM. Potential gains from hospital mergers in Denmark. Health Care Manag Sci. 2010;13(4):334-45.
31. Azevedo H, Mateus C. Cost effects of hospital mergers in Portugal. Eur J Health Econ. 2014;15(9):999-1010.
32. de Kok K, van der Scheer W, Ketelaars C, Leistikow I. Organizational attributes that contribute to the learning & improvement capabilities of healthcare organizations: a scoping review. BMC Health Serv Res. 2023;23(1):585.
33. van den Hoed MW, Backhaus R, de Vries E, Hamers JPH, Daniels R. Factors contributing to innovation readiness in health care organizations: a scoping review. BMC Health Serv Res. 2022;22(1):997.
34. Cardinaal EMM, Tjan MJH, Jeurissen PPT, Berden H. Academic Medical Centres in the Netherlands: muddling through or radical change? Frontiers in Public Health. 2024.
35. Kvale S. Validity in the qualitative research interview. Psykologisk Skriftserie Aarhus. 1987.
36. Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. Qual Quant. 2018;52(4):1893-907.

Supporting information

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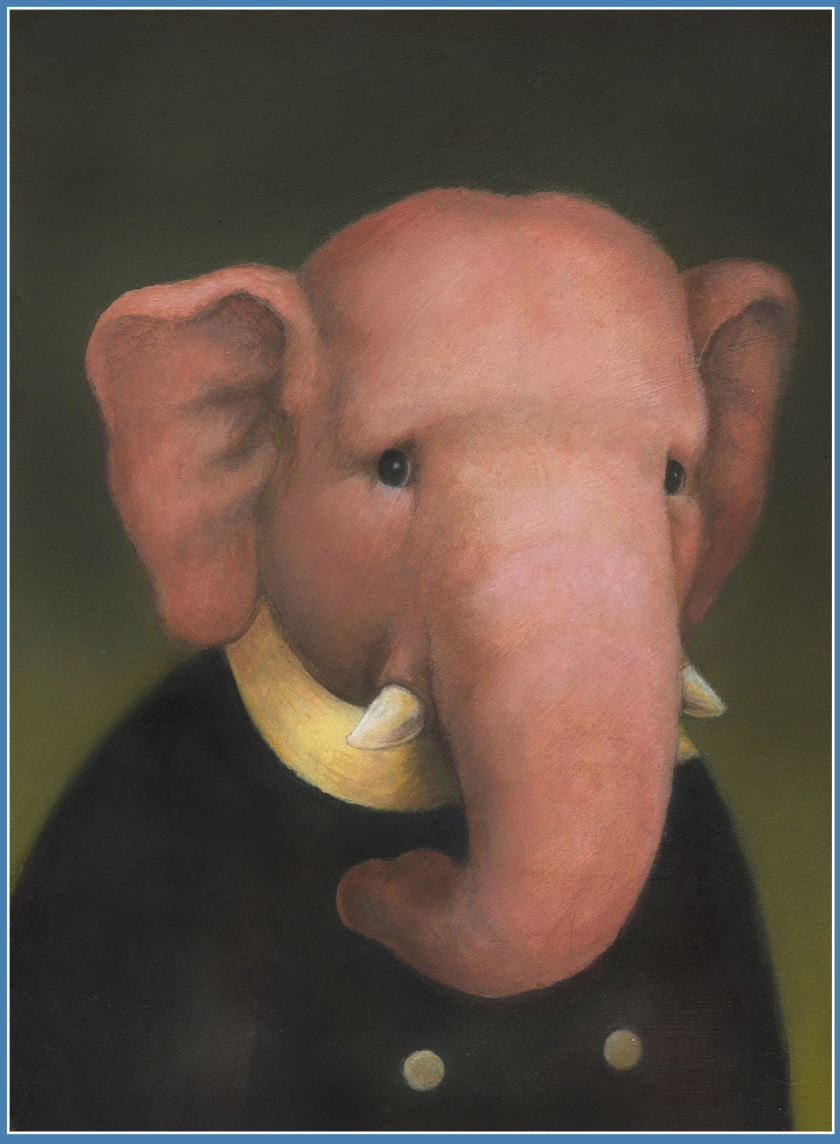
- File 1 Respondents per university medical centre
- File 2 Questionnaire overview



Chapter 5

Academic medical centres in the Netherlands: Muddling through or radical change?

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ABSTRACT

Academic medical centres (AMCs) are designed to perform multiple functions within a single organisation. This institutional complexity creates complex governance challenges and encourages incrementalism and confusion. This study hypothesised that radical change might be a solution to the current incrementalism, and explored the conditions under which such change might or might not be achieved. To this end, unstructured interviews were conducted with a number of high-level stakeholders and issues were identified that have negatively affected the governance of Dutch AMCs, including: 1) negative undercurrents and unspoken issues due to conflicts of interest, 2) organisational complexity due to relationships with university and academic medical specialists, 3) lack of sufficient government direction, 4) competition between AMCs due to per between AMCs due to perverse systemic incentives, 5) different interests, focus and organisational culture, 6) concentration of care culture, 6) concentration of care, which does not always lead to improved quality and efficiency, as the provision of less provision of less complex care is of paramount importance for education and research; 7) the infeasibility of the public and regional functions of an AMC, 8) the inefficiency of managing three core functions within the same organisation, and organisation, and 9) the regulation of the health care market. The hypothesis that radical change offers a solution to the current incrementalism in AMCs could not be adequately tested. Indeed, the exploration of the conditions under which radical change could potentially occur revealed that there are currently factors at play that make a substantive conversation among stakeholders about radical change difficult, if not impossible. The findings also show that there is an opportunity for government to take the leadership in creating conditions that foster mutual trust and common interests among AMCs and between AMCs and between AMCs and other hospitals.

1. INTRODUCTION

Between 1983 and 2007, eight academic medical centres (AMCs) were established in the Netherlands. The distinctive feature of AMCs, which distinguishes them from other Dutch hospitals in the country, is the integration of patient care, research, education and training within a single organisation. The Health Insurance Act ("Zorgverzekeringswet"), in force since 2006 [1], is based on the principle of market forces, which led to a discussion on how the public functions of an AMC should be managed and regulated. Since, in addition to their hospital function, AMCs fulfil the three public functions of tertiary care, scientific research and medical education and training, the Minister of Health has emphasised that AMCs are different from the main clinical and general hospitals [2], justifying the allocation of specific funding to support these public functions. In this construct, collaboration is crucial and both AMCs and other hospitals are expected to outperform themselves and put patients' interests first, with a strong focus on balancing quality, accessibility and affordability [3]. Since their establishment in the 1980s, politicians and other stakeholders have questioned the effectiveness of AMCs, and critics have questioned whether their specific funding is justified compared to other hospitals. In other words, they have questioned the unique position of AMCs. For more than 40 years, the unique position of AMCs has been questioned and they have been accused of a lack of transparent accountability [4]. This is compounded by the complex interrelationships between government, insurers, AMCs, medical schools and professional interest groups, and the fact that there have been no (or only minor) changes for decades, as evidenced by the history of AMCs. In this research this is referred to as muddling through. Charles Lindblom introduced the term "muddling through", which he later articulated as incrementalism [5, 6], referring to the decision-making process as a series of small, mostly intuitive changes. In contrast, large, carefully planned changes make incrementalism evolutionary rather than revolutionary. Incrementalism continues to influence empirical research and theoretical debates [7]. This study hypothesises that radical change could provide a solution to the current incrementalism, and explores the conditions under which such change might or might not be achieved.

1.1 Theoretical framework

Dutch AMCs have been the subject of public debate since their inception. This debate questions their unique position and effectiveness. In recent years,

AMCs have failed to make major changes that could silence the debate. Therefore, in this research the current so-called incrementalism (muddling through) is contrasted with radical change.

1.1.1 Incrementalism

Incrementalism refers to what Charles Lindblom introduced in 1959 with the term "muddling through", which he later articulated as incrementalism [5, 6]. He described the decision-making process as a series of small, mostly intuitive changes. Lindblom argued that public administrators and policy analysts in Western democracies generally confine themselves to incremental or marginal adjustments in policy. They do this, he argues, not to simplify the challenges, but to be able to add something themselves during their time in office. Lindblom concludes that the policies of public organisations are almost entirely incremental; policy changes almost never involve radical change. In 2011, Rothmayer-Allison et al. conducted a comprehensive study of the current relevance of incrementalism in public policy and administration. Their research shows that Lindblom's incrementalism is still relevant today [7].

1.1.2 Radical change

Radical organisational change involves letting go of existing organisational structures and transforming into other structures [8]. Unlike convergent change, which involves minor adjustments, radical change requires letting go of an existing situation and creating a new one that is better suited to current challenges [9]. In their article, Chreim et al. conclude that radical change is difficult to achieve in organisations and systems in general, and in health systems in particular [10]. Healthcare systems are characterised by multiple objectives and multiple stakeholders with different interests. Radical change consists of changes in values, structures and practices, and for multiple stakeholders in a health care system to agree on the form and content of radical change, several facilitating factors must be present [11, 12]. According to Greenwood and Hinings [13], there is an increasing need for organisational change and a growing focus on radical change.

2. METHODS

We provide an overview of the historical, political and legal landscape in which Dutch AMCs operate, followed by unstructured interviews with expert stakeholders with comprehensive knowledge of the management

and policy of Dutch healthcare in general and AMCs in particular. To the knowledge of the researchers, no research has been conducted on this topic. This study is an initial exploration of the issues surrounding the topic. Therefore, a small research population was chosen, which means that not all perspectives (stakeholders) around this topic were included in the study. The purpose of an unstructured interview was to have a free conversation with the respondents. As there is little scientific data available on this topic, the intention was to determine the interview questions during the course of the interview. In addition, the unstructured setting was intended to create a situation in which respondents felt in control of the interaction, which might make them more open to giving more detailed answers [14, 15]. Participants were invited to participate in the interview with a probing opening question about whether the complexity of AMC governance would decrease in the scenario of one AMC instead of the current eight. The boundaries of the interview were monitored by the interviewers using a pre-formulated framework (supporting information Supplementary File 3). This approach was aimed at gaining insider perspectives and extending the limited current understanding of the topic. To ensure methodological rigour, we followed the COREQ (Consolidated criteria for reporting qualitative research) checklist (supporting information Supplementary file 1) [16]. Two authors (EC and MT) carried out unstructured interviews. Participants were selected using purposive sampling [17]. The selection process aimed to ensure that respondents were representative of the key strategic issues for AMCs. To broaden the scope of this study, respondents (n=7) from different organisations with different functions and perspectives on the healthcare landscape were asked (supporting information Supplementary file 2). The interviews were conducted between October 2020 and December 2020. Interviews were preferably conducted face-to-face (n=4). However, some interviews were conducted via videoconference due to travel distance and personal preference arising from the COVID-19 pandemic (n=2). One participant was interviewed by telephone because videoconferencing was not possible. Prior to the start of the interviews, written informed consent was obtained and participants were given a brief overview of the study (supporting information Supplementary file 3). The audio recording was then initiated. To reduce the risk of technical failure, two audio recorders were used for each interview. The duration of the interviews varied between 45 and 60 minutes. All interviewees were offered copies of their transcripts.

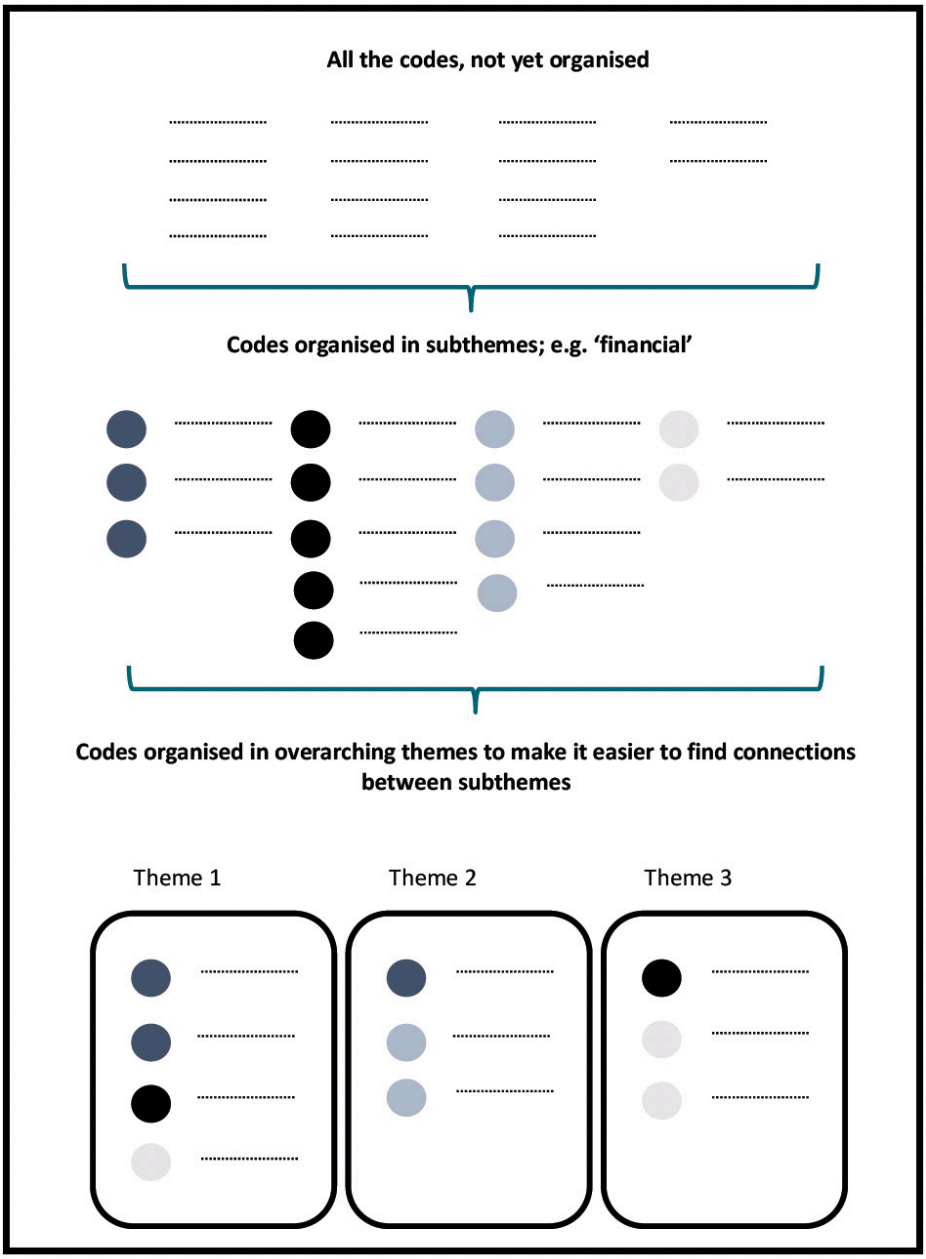
2.1 Data analysis

An inductive approach to data analysis was used, applying thematic analysis to elicit the opinions and experiences of high-level stakeholders regarding the governance of AMCs [18]. The themes were determined by the data obtained from the interviewees. The interviews were transcribed using ATLAS t.i. 8.4.20 [19]. The transcripts were analysed, with data collection and analysis taking place simultaneously, in order to facilitate the refinement of subsequent interviews (e.g. to explore areas not previously covered). Codes were generated using an inductive coding strategy. Codes were analysed thematically, with loose codes grouped into sub-themes and overarching themes [20]. This helped to make connections despite the large amount of raw data. For each sub-theme and overarching theme, quotations were marked in the transcripts to clarify context or meaning. A total of 97 codes were derived from the seven transcripts. These codes were grouped into 14 sub-themes and nine overarching themes to establish links between the different codes (see fig 1 Organisation of Codes). The coding was prepared by one author (MT) and feedback was provided by a second author (EC). The same method was used to create sub-themes as the overarching themes, thereby minimising the risk of bias among coders [21]. The themes were determined by the data obtained from the interviews. Inherent in the system of thematic analysis is the possibility that not all themes were covered. Nevertheless, the authors agree that key themes have emerged in this study. Participants were invited to provide feedback on the transcription. None of the interviewees made any changes.

2.2 Ethical approval

All participants signed an informed consent form before completing the questionnaire. The Research Ethics Committee of Radboud University confirmed that this study was conducted in accordance with the relevant legislation on research ethics review, such as the Medical Research involving Human Subjects Act and the Medical Treatment Contracts Act (file number 2022-13898). Consequently, the study received ethical approval from the Research Ethics Committee.

Figure 1 Organisation of Codes



In total, 94 codes were derived from 7 transcriptions. These were grouped in 14 subthemes (only 4 different subthemes shown in figure for demonstration purposes). Last, the codes and their accompanying subthemes were grouped in 9 overarching themes (3 shown here).

3. RESULTS

This study hypothesised that radical change could provide a solution to the current incrementalism and explored the conditions under which such change could or could not be achieved. This hypothesis that radical change offers a solution to the current incrementalism in AMCs could not be adequately explored. The exploration of the conditions under which radical change could take place revealed that there are currently factors at play that make the implementation of radical reforms in health care difficult, if not impossible.

3.1 Historical context

Until the end of the 19th century, most patient care in the Netherlands took place at home, at least for those who could afford it. Over time, medical care outside the home became increasingly accepted. This development culminated in the establishment of the first private hospitals. In the late 19th century, some private hospitals expanded patient care to include teaching and research. This gave rise to the forerunners of AMCs. In the 20th century, demand, supply and costs in the Dutch healthcare system increased enormously, leading to the start of the reorganisation of Dutch hospital care in the 1970s. For the Dutch AMCs, this meant that they were given the status of independent legal entities by law (Act amending the Scientific Education 1969 [22]). The law thus linked AMCs to medical faculties for education and research and gave AMCs a special position in the Dutch hospital landscape [23]. Today, the Netherlands can be defined as a decentralised unitary state with approximately 17.5 million inhabitants, in which health policy is decided at national level with some delegation of health system management to local government (provinces and municipalities). The health care system is characterised by a mix of regulated competition and market-oriented, incentive-based health care [24]. Hospital care in the Netherlands is divided into academic medical centres, top clinical hospitals and general hospitals (Table 1). AMCs are large hospitals with a leading position in highly complex patient care, scientific research, education and training. Top clinical hospitals provide primary care as well as care that requires specific specialist facilities, offer training places for medical specialists and are often involved in scientific research. General hospitals are regional hospitals that provide mainly primary care and are relatively small, so do not usually have specialist teams for many types of illness. These hospital groups are surrounded by outpatient clinics, specialist hospitals and independent treatment centres.

Table 1. Key figures AMCs, Top Clinical Hospitals, General Hospitals (figures rounded up)

	Entities (amount)	Employee (fte)	Annual Turnover (million)	Patients (million)
Academic Medical Centres	7 [25]	88.000 [25]	11.000 [25]	1.26 [25]
Top Clinical Hospitals	27 [26]	81.000 [26]	8.100 [26]	4.59 [27]
General Hospitals	41[26]	53.000 [26]	6.600[26]	3.73 [27]

25) 2022

26) 2019

27) 2022

3.2 Political and legal context

Between 1983 and 2007, the Dutch AMCs were established and adopted the organisational structure that is currently recognised (integrated university-hospital relationship). These AMCs differ from the top clinical and general hospitals in that they have been assigned three public functions in addition to the general hospital function: 1) to provide tertiary care, 2) to carry out (bio)medical scientific research and 3) to provide medical education and training. In 1992, the legal framework for Dutch AMCs came into force as part of a complete revision of the Higher Education Act (WHW, Wet op Hoger Wetenschappelijk Onderwijs) [28]. The WHW defines the role and functioning of AMCs in health care, education and research, as well as their relationship with universities. This law requires the establishment of a so-called staff committee, an advisory body to the board of directors, consisting of all medical department heads, who are usually also full-time professors. Since 2006, the Health Insurance Act (1) and the Health Care Market Regulation Act [29] have been in force, introducing more market forces into the health care system. Under these laws, AMCs must compete with other healthcare providers for production quotas for curative care. In addition, all health care providers, including AMCs, must negotiate with health insurers and demonstrate what they do and at what price and quality. The law distinguishes between care that is left to market forces and functions that require special funding because of their public nature. These public functions put AMCs in a special position compared to general and tertiary hospitals. In a letter to the House of Representatives, the Minister of Health and the State Secretary for Education emphasise that innovation and development of top referral care cannot be left to market forces, as this would not guarantee the public interest in sufficient supply and quality. The Dutch Health Care Authority and the Dutch Competition Authority must ensure that AMCs do

not impede market forces (e.g. by using their additional resources to compete unfairly with other institutions in primary care) [30].

In 1998, the Minister of Health and the Minister of Education pointed to the need to maintain, improve and develop the top referral function in academic hospitals [31]. The different public functions of the AMCs have different sources of funding, which makes it difficult in practice to distinguish which financial flows are used for which task and to what extent the financial flows contribute to the public tasks of the AMCs [32] (supporting information Supplementary file 4).

The AMCs (united in the Dutch Federation of University Medical Centres) and the Minister of Health launched the ROBIJN project [33]. The aim of this project was to establish definitive criteria that could describe the characteristics of an academic patient and enable the qualification of high-level referral care. Using these labels, it is possible to determine which organisation has an academic patient population and is therefore eligible for a financial contribution on the basis of the policy rule Availability Contribution Academic Care [34]. In other words, this was a tool that also needed to demonstrate to stakeholders that AMCs were different and deserved additional public funding. In 2014, the Minister of Health and the Minister of Economic Affairs wrote a report outlining the unique position that they believed AMCs occupied in the healthcare landscape. However, the Ministers felt that AMCs should make greater efforts to reach mutual agreements on the distribution and concentration of care [35]. In 2019, the Minister of Health underlined the importance of AMCs in a letter to the Chamber of Deputies. He stressed that the social responsibility of AMCs justifies their current financial and strategic advantages over other hospitals. He also gave AMCs the responsibility to make changes to improve their distinctiveness and efficiency, thereby ensuring the long-term sustainability of health expenditure [3].

Since their inception, the position and unique role of AMCs have been the subject of regular political debate. After 40 years, the AMCs have apparently failed to parry these discussions. Nevertheless, their position in the Dutch health care landscape is viewed more than critically. This is partly due to the complex interrelationships between the government, insurers, AMCs, medical faculties and professional interest groups, and partly to the fact that no (or only minor) changes have been made for decades, as the history of the

AMCs shows. In the study, this referred to the latter as muddling through or incrementalism.

3.3 Interviews

The interviews show that cooperation among AMCs and between AMCs and other stakeholders is hampered by a number of problems. This section highlights the most striking findings. In addition, Fig 2 provides a detailed overview of the main findings by topic.

3.3.1 Conflicts of interest

All participants noted that conflicts of interest between AMCs prevent cooperation and decisions that could benefit Dutch society as a whole. AMC directors stated that if they had to make a choice, they felt responsible for putting the interests of their own organisation first. They also noted that collaboration with regional hospitals was hampered by differences in values, vision and organisational culture. Other interviewees emphasised this, noting that these differences are often the unspoken reason (undercurrent) why collaboration between these parties is difficult. The comments of participant 1, the chairman of the board of an AMC, were illustrative: "But before we get there (one AMC instead of the current eight, red.), the management style we are used to will not work. This is certainly a cultural issue. And it also has to do with favours and people'. I have seen the battle between Utrecht, Rotterdam, Amsterdam and Leiden over the children's hospital (concentration of paediatric oncology, red.). We stand in each other's way. There are laws and practical objections between the dream and the deed'.

3.3.2 Organisational complexity

Several bottlenecks related to organisational complexity were mentioned. Most interviewees felt that although the AMC's relationship with a university distinguishes it from regional hospitals, such collaboration also increases organisational complexity and hinders efficiency. Four participants felt that the strong influence of academic medical specialists and professional groups hindered the governance of the AMC. Oversight by different government departments (e.g. the Ministry of Health and the Ministry of Education) was seen as inefficient and a reason for the complexity of AMC governance.

3.3.3 Governance

Most participants mentioned that more directive guidance from the government could stimulate collaboration between health care organisations.

They also see such guidance as not only desirable but mandatory. Participant 6 explained this perspective: 'Politics is ultimately responsible for the public interest. But we have outsourced so much responsibility (...) that at the moment politicians are hardly in a position to take back the reins'.

Participants perceived the traditionally strong Dutch consensus culture as difficult and time-consuming, leading to delays or even failures in implementing change. Participant 5, chairman of the board of the AMC, noted that '... and as administrators among yourselves you may think that something should be done in a certain way, but the question is whether your staff, and especially the medical specialists, agree with it'. However, the same culture of consensus can also facilitate broad support.

3.3.4 Competition

Most respondents believe that competition improves the quality of care and research. However, all participants felt that competition between AMCs and between AMCs and regional hospitals is currently so strong that it hinders cooperation and decision-making for the benefit of society. Some even spoke of collaboration being disrupted because of the lack of trust caused by competition between AMCs and regional hospitals. Participant 7 said: 'We are attacked from two sides: we have to give away regular care to regional hospitals, but on the other hand we compete with them for highly complex care and the academic funding that goes with it. If we don't stop this, I think we will end up in an undesirable situation where precious resources are spread too thinly, making it impossible to invest in certain spearheads. (...). And of course AMCs need to be monitored for efficiency and there needs to be some incentive, but it must not jeopardise the survival of the current health care system with the pyramid referral system where smaller hospitals refer to larger hospitals and these refer to AMCs as a last resort'.

3.3.5 Collaboration

There is unanimous agreement that collaboration is an important strategy for AMCs to improve the quality of care and research. However, participants indicated that constructive collaboration depends on personal relationships, which they identified as a vulnerable aspect of building sustainable collaborative partnerships. Indeed, collaboration between AMCs and regional hospitals is characterised by different interests, priorities and organisational cultures. Adding to the complexity, the financial system emphasises outcome-based funding and individual performance rather than

collective performance. Most participants saw this as a barrier to successful collaboration. Finally, participants mentioned that competition between hospitals is fierce and has existed for a long time. As a result, collaboration based on trust and mutual benefit is not a given.

3.3.6 Concentration of high complexity care

Concentration of high-complexity care in AMCs could be beneficial, according to all participants. They stated that the concentration of tertiary care does not necessarily have to take place in all AMCs, but could be accommodated in two or three AMCs/centres. A quote from participant 3, former chairman of the board of a health insurance company Everyone thinks everything is important. It is difficult to prioritise, even more difficult to prioritise'. The most common arguments in favour of concentration were improved quality of care and increased efficiency through economies of scale. Some respondents felt that more concentration of complex care should go hand in hand with more decentralisation of regular care. The AMC board members agreed that a certain level of less complex care is of paramount importance for education and research, as students learn most from common rather than rare diseases, and research into more 'common' diseases has a greater social impact.

3.3.7 Public and regional role

All participants agreed that AMCs have a public and regional role. However, participants expressed doubts about the prioritisation of these roles by the AMCs. The three board members of the participating AMCs faced the dilemma of managing large organisations with a large number of employees on the one hand, and serving the public interest on the other, which can sometimes be conflicting. Four interviewees stressed the importance of working on health and social issues specific to their region. Given the regional context, it is clear that the issues will be different in each AMC.

3.3.8 Tripartite function

Participants agreed that the tripartite function, together with the relationship with the university, distinguishes AMCs from other hospitals or health care organisations. However, the integration of these three core functions (healthcare, research and education) within a single organisation makes AMCs inefficient. In this context, one participant wondered whether the different core functions necessarily have to function within one organisation or whether they could be separate, co-operating entities, which could reduce some of the inefficiencies.

3.3.9 Market regulation

Since the implementation of the 'Health Insurance Act' (Zorgverzekeringswet) in 2006, market forces have been introduced into the health care system. The system is based on regulated competition between health insurers and health care providers with the aim of providing citizens with the best care at the lowest cost. However, all interviewees were unanimous in their view that there is a lack of real market regulation, resulting at best in a quasi-market or semi-regulated market. Four of them argued that market forces should not be applied to health care. According to them, market forces do not provide incentives to improve cooperation between health care providers.

Figure 2 Main findings per theme

THEME	STATEMENT	AMC	AMC	UMBRELA ORGANISATION	STRATEGIC ADVISER	HEALTHCARE INSURER	HEALTHCARE INSURER	GOVERNMENT
UNDERCURRENT	AMCs promote their own interests before the public interests							
	Underlying values, vision and organisational culture hinders collaboration							
ORGANIZATIONAL COMPLEXITY	The different tripartite functions differ greatly in governance, culture, values, business models, et cetera							
	The relationship between AMCs and their university creates organization complexity							
	The influence of medical specialists and other professionals within an AMC complicate organization							
GOVERNANCE	A more directive style of the government is needed to stimulate or even oblige collaboration							
	The Dutch consensus culture complicates decision making and collaboration							
COMPETITION	Currently, competition prevents collaboration and decisions benefiting society							
	Outcome financing is inducive to competition in contrast to collaboration							
	AMCs and other hospitals have competed for a long time, inciting distrust and hampering collaboration							
COLLABORATION	Collaboration improves quality of care and research							
	Collaboration is built upon people, making it fragile							
CONCENTRATION	High complexity care should be concentrated more than it currently is							
	Certain technological/expensive infrastructure should be concentrated more than it currently is							
	Concentration might lead loss of expertise in the other AMCs							
	AMCs should stop doing most regular care							
	There should always be at least 2 locations, to have friendly competition and redundancy							
PUBLIC AND REGIONAL ROLE	AMCs do not seriously see society's interest as a priority							
	AMCs are working at health-related issues in their region							
	AMCs should have a leading role in their region							
TRIPARTITE FUNCTION	More of the research and education could be off-loaded to other hospitals							
	Having the tripartite function in 1 organisation creates added value							
MARKET REGULATION	There are true market forces at play in the Dutch healthcare sector							
	Market forces mainly benefits healthcare/AMCs							
	Market forces sometimes prevent collaboration							

Legend: Not discussed/no opinion given. Positive stance towards statement. Negative stance towards statement.

4. DISCUSSION

Dutch AMCs fulfil public functions within one organisation, including (highly complex) patient care, education, training and research. This leads to a complex governance of seemingly incompatible interests and has raised questions about the effectiveness and transparency of AMC governance since its inception. This study identifies nine issues that affect the effectiveness of governance in Dutch AMCs. Constructive cooperation between AMCs and between AMCs and other hospitals is negatively affected by: 1) negative undercurrents and unspoken issues due to conflicts of interest, 2) organisational complexity due to the relationship with a university and with academic medical specialists, 3) lack of sufficient government direction, 4) competition between AMCs due to perverse systemic incentives, 5) different interests, focus and organisational culture, 6) concentration of care, which does not always lead to improved quality and efficiency, as the provision of less complex care is of paramount importance for education and research, 7) the infeasibility of public and regional functions of an AMC, 8) the inefficiency of three core functions within the same organisation, and 9) the regulation of the health care market.

This study shows that stakeholders perceive AMCs as inherently technically inefficient. However, this does not necessarily imply inefficiency in terms of allocation and quality of care.

4.1 Complex governance

AMCs are considered to be among the most complex organisations in the world due to their tripartite mission, the absence of a formal hierarchy and the presence of public functions [36]. AMC leaders struggle with this complexity, as evidenced by the variety of solutions they employ. These leaders often search unsuccessfully for solutions to organisational change and business models [37-39]. Prior to this research, several scholars have pointed to the importance of considering the number of AMCs to meet contemporary challenges. DeAngelis contrasts Darwin's survival of the fittest with Kropotkin's emphasis on cooperation, arguing that cooperation prevails when there is a common goal. She sees a solution in reducing the number of AMCs by national decision. She cites Fein, who shares this view and also emphasises the collective responsibility of AMCs to address these issues [40, 41]. Porter et al. elaborated on this in 2015 [42]. In their article, Porter et al. ask whether mergers are necessary to build the required

scale, or whether the organisation should expand through partnerships and affiliations. They call on managers to make strategic choices, also with regard to density and size. This perspective is certainly true in the Dutch context, where the distinctiveness and competitive positioning of each Dutch AMC in relation to the others is limited [39]. The number of AMCs in the Netherlands has been the subject of debate in opinion magazines for years, with proposals ranging from fewer AMCs (whether or not through mergers) to the establishment of only one AMC with nationwide coverage by setting up academic departments in other hospitals, leaving room for research and teaching. Discussions and trends regarding the division of responsibilities between AMCs and the concentration of highly specialised patient care, such as cardiac surgery and paediatric oncology, are ongoing [43, 44].

4.2 Collaboration

The results of this research show that successful collaboration between AMCs and between AMCs and other hospitals is hampered by mutual competition and undercurrent/unspoken problems due to perverse systemic incentives. Since the beginning of the last decade, the main strategy for improving efficiency seems to have shifted from organisational integration to networking and increased collaboration [45]. However, several studies show that the expected benefits of these initiatives are usually not realised [46-48]. Once the decision to integrate or collaborate has been taken, actual implementation often fails to materialise, partly because of the impact of market regulation. But while this remains undisputed in the public debate, the research reveals a strong undercurrent (unspoken issues) that has a negative impact on successful collaboration and thus on the effectiveness of AMCs. Participants openly mentioned conflicting interests, perverse financial incentives, institutional pride, mistrust and competition as obstacles. This undercurrent has implications for network strategy, as it plays a role in the relationship between AMCs and regional hospitals. In the Netherlands, AMC leaders are hampered by market-driven incentives that inhibit their ability to develop a shared vision of healthcare and a collaborative approach to complex governance challenges.

4.3 Critical junctures in sight?

On the basis of the research findings, the question arises as to whether it is still effective, feasible, sustainable or desirable for the eight Dutch AMCs to continue to perform the entire portfolio of hospital care, tertiary care, (bio) medical research, education, training and other societal tasks. Indeed, this leads to increasing wicked governance problems due to multiple stakeholders and multiple conflicting demands. This question is supported by Baumgartner and Jones' punctuated equilibrium theory. In their 2009 publication, they argue that they chose the terminology of punctuated equilibrium because it conjures up the image of stability being interrupted by drastic changes in a system. Systems can be stable without necessarily being in equilibrium, so they do not claim that all periods of stability are signs of equilibrium; they may simply be the result of the absence of external perturbations [49]. Years of muddling through and searching for solutions to wicked problems of governance and effectiveness invite a radical rethinking of the governance of AMCs in the Netherlands. Recent statements by the current Minister of Health shed light on the attitudes of health care administrators and the plethora of health care organisations in the country. The leaders of health care organisations should be more aware and act in the larger interest of health care [50]. The health care situation calls for a paradigm shift. The pressing need for care and the shortage of human resources are major issues that underline the importance of the health care parties stopping their competition and being forced to work together. According to a report published in 2021 by the Scientific Council for Government Policy (WRR), the quality and accessibility of care will come under increasing pressure due to an ageing population, the emergence of new care technologies and the increase in the number of chronically ill people. To ensure the long-term financial, human resource and social sustainability of health care, the WRR advocates limiting the growth of care and making better decisions about the prioritisation of care [51]. The health sector is under pressure from rising health care costs, increasing workforce shortages and the growing number of patients with multiple chronic conditions. This burning platform is further fuelled by massive inflation, the energy crisis and the aftermath of the two-year pandemic. Under these circumstances, the Integral Care Agreement ("Integraal Zorgakkoord") was recently signed in the Netherlands. This agreement calls on all parties to 'bring about a radical change in the Dutch healthcare system and also in society's perspective on healthcare' [52]. However, this research has shown that a number of conditions need to be met before such sensitive discussions about (radical) change can take place.

Ideally, government should take the lead in creating conditions that foster mutual trust and common interests between AMCs and between AMCs and other hospitals. This should lead to an environment, a marketplace, where AMC leaders can discuss change and also feel safe to put the common interest before the interest of their own organisation. Research respondents are open to a stronger leadership role for government. According to punctuated equilibrium theory, government can act as a facilitator of external disturbances to ensure a new equilibrium.

4.4 Limitations

The limited number of participants included in this study may have influenced the interpretation of the results [53]. However, the interviewees were selected because they were in positions where they had a comprehensive knowledge of the topic [21]. As this was an exploratory study on a broad topic, unstructured interviews were chosen [54]. Unstructured interviews can take unexpected turns, making data collection and analysis challenging. Each interview may have a different focus on the topic, making comparisons difficult, and relevant topics may not be discussed or, conversely, irrelevant topics may be discussed. This study aimed to mitigate these challenges by using coding through thematic analysis. Coding was carried out by one author (MT) and a second author (EC) provided feedback. The same method was used to create sub-themes as overarching themes. This reduced coder bias. A thematic analysis should be treated with caution. This form of analysis can be subjective because it is largely based on the judgement of the researchers. In addition, certain themes may be overlooked in the search for larger or overarching themes.

4.5 Conclusions

This study hypothesises that radical change could provide a solution to the current incrementalism in AMCs and explores the conditions under which such change might or might not be achieved. The hypothesis that radical change offers a solution to the current incrementalism in AMCs could not be adequately explored. In fact, the exploration of the conditions under which radical change could take place revealed that there are currently factors at play that make the implementation of radical reforms in health care difficult, if not impossible. Organisational complexity, a lack of mutual trust and common interests, and distorted systemic incentives prevent a substantive debate on the forms of cooperation and the position or number of AMCs in

the Netherlands. Incumbent AMC leaders find it difficult to subordinate the interests of their own organisations to broader interests.

Greenwood and Hinings have developed a model for understanding organisational change [11]. They identify two internal pressures for change. First, the existence of groups that are dissatisfied with the way their interests are represented within an organisation. These groups link the prevailing organisational structure (which shapes the distribution of advantages and disadvantages) to what they are dissatisfied with at the time when alternatives are available. This study found that some dissatisfaction with the current organisation of AMCs is related to the organisational structure. However, the explicit prompting of the discussion topic of the alternative of an AMC did not yield decisive results regarding the relationship between dissatisfaction and organisational structure. Greenwood and Hinings point out that dissatisfaction does not lead to change. To this end, they identify the so-called 'value commitment patterns' as a crucial second means of pressure. They identify four general patterns of value commitments 1) status quo (all groups are committed to the existing organisation) 2) indifferent (groups are neither committed nor opposed) 3) competitive (some groups support the current organisation while others prefer an articulated alternative) 4) reform (all groups are opposed to the current organisation and prefer an articulated alternative). Based on the research findings, the Dutch AMCs fit the pattern of competitive engagement. The opinions of the various stakeholders clearly show competitive elements. According to Greenwood and Hinings, radical change is possible when there is competitive value commitment, but because competitive change implies the presence of resistance, competitive commitment is associated with evolutionary change (incrementalism).

If there is any internal pressure to change, radical change can only occur in combination with two factors that make radical change possible. First, Greenwood and Hinings see a reciprocal relationship between power dependencies and value commitments. Radical change in a situation of competitive commitment is unlikely unless those with privilege and power are in favour of the proposed change. Power dependencies enable or suppress radical organisational change. Second, the ability to manage the transition process from one organisation to another. This means having a sufficient understanding of the new conceptual goal, having the skills and competencies needed to function in that new goal, and having the ability to manage how to achieve that goal. High capacity is associated with radical

change. The research respondents could hardly imagine a possible change in the organisation, let alone a change in the Dutch healthcare landscape where there would be only one AMC. Nor did they come up with alternative proposals. This means that they did not even come to the question of the skills and management required for this change.

In summary, contrasting the findings of this research with Greenwood and Hinings' precipitating and enabling dynamics, it can be concluded that a debate on radical change is unlikely in the short term. Although respondents signal that the current organisational structure is flawed, these signals are not expressed with the same intensity by all stakeholders. There are conflicting views on how AMCs should organise themselves and relate to other stakeholders. Some interviewees even spoke of conflicting interests, fierce competition and mistrust. This is linked to power dependencies that inhibit radical organisational change. None of the interviewees showed much capacity for action. All these observations confirm a situation and culture of incrementalism and little or no breeding ground for radical change.

Ideally, the government should take the lead in creating conditions that foster mutual trust and common interests among AMCs and between AMCs and other hospitals. This should lead to an environment in which AMC leaders can discuss change and feel safe to put the common interest ahead of the interest of their own organisation. According to punctuated equilibrium theory, the government can act as a mediator of external disturbances to ensure a new equilibrium.

Knowledge of the current research topic is still in its infancy. It has been noted that there is still little scientific literature on the governance of academic medical centres [55]. At the same time, it is known that the governance problems of European AMCs are perceived as similar [56]. Therefore, this study may be of interest to countries in a similar situation that wish to initiate a discussion about change. A robust follow-up study on this topic is warranted. This could include responses from more respondents.

References

1. Zorgverzekeringswet. [Internet] Available from: https://wetten.overheid.nl/ BWBR0018450/ 2022-01-01. [Last accessed 2022-04-03].
2. Bruins B. Visie op medisch zorglandschap 2019. [Internet]. Available from https:// www. tweedekamer.nl/kamerstukken/detail?id=2019Z15048&did=2019D30923.[Last accessed 2022-04-03].
3. Bruins B. Maatschappelijke rol van umc's in het medisch zorglandschap 2019. [Internet]. Available from https://www.tweedekamer.nl/kamerstukken/brieven_regering detailid= 2019Z15053&did=2019D30930. [Last accessed 2022-04-03].
4. Schippers E. Interdepartementaal Beleidsonderzoek Universitair Medische Centra (UMC's) (2012-05-23). [Internet]. Available from: https://www.parlementairemonitor.nl/9353000/1/ j9tvgajcovz8izf_j9vvij5epmj1ey0/vizxe96bffxk. [Last accessed 2024-03-30].
5. Lindblom CE. The Science of Muddling Through. Public Admin Rev. 1959;19(2):79-88.
6. Lindblom CE. Still muddling, not yet through. Public Admin Rev. 1979;39(6):517-26.
7. Rothmayr Allison C, Saint-Martin D. Half a century of “muddling”: Are we there yet? Policy and Society. 2011;30(1):1-8.
8. Miller D. Evolution and revolution: a quantum view of structrual change in organizations. Journal of Management Studies. 1982;19(2):131-51.
9. Romanelli E, Tushman ML. Organizational Transformation as Punctuated Equilibrium - an Empirical-Test. Acad Manage J. 1994;37(5):1141-66.
10. Chreim S, Williams BE, Coller KE. Radical change in healthcare organization: mapping transition between templates, enabling factors, and implementation processes. J Health Organ Manag. 2012;26(2):215-36.
11. Greenwood R, Hinings CR. Understanding radical organizational change: Bringing together the old and the new institutionalism. Acad Manage Rev. 1996;21(4):1022-54.
12. Greenhalgh T, Humphrey C, Hughes J, Macfarlane F, Butler C, Pawson R. How do you modernize a health service? A realist evaluation of whole-scale transformation in london. Milbank Q. 2009;87(2):391-416.
13. Greenwood R, Hinings CR. The SAGE Handbook of Organization Studies. 2006 2023/10/16. London: SAGE Publications Ltd. 2. Available from: https://sk.sagepub.com/reference/hdbk_ orgstudies2ed.
14. Mueller A, Segal D. Structured versus Semistructured versus Unstructured Interviews. 2015.
15. Low J. Unstructured and Semi–Structured Interviews in Health Research. Researching Health: Qualitative, Quantitative and Mixed Methods. 2019:123-41.
16. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349-57.
17. Etikan I. Comparison of Convenience Sampling and Purposive Sampling. American Journal of Theoretical and Applied Statistics. 2016;5:1.
18. Javadi M, Zarea K. Understanding Thematic Analysis and its Pitfall. Journal of Client Care. 2016;1(1).
19. McLellan-Lemal E, Macqueen K, Neidig J. Beyond the Qualitative Interview: Data Preparation and Transcription. Field Methods. 2003;15:63.
20. Thomas DR. A general inductive approach for analyzing qualitative evaluation data. American Journal of Evaluation. 2006;27(2):237-46.

21. Morse J, Barrett M, Olson K, Spiers J. Verification Strategies for Establishing Reliability and Validity in Qualitative Research. Int J Qual Meth. 2002;1:13-22.
22. Wet tot wijziging van de Wet op het wetenschappelijk onderwijs (Act amending the Scientific Education Act 1969) Staatsblad van het Koningrijk der Nederlanden, 1969, no. 326-400, 01-01-1969 » 01 jan 1969 - Pag. 24 | Delpher. [Accessed 28 October 2023].
23. Mooij A. Doctors of Amsterdam: Amsterdam University Press; 2002.
24. Davies SM, Tawfik-Shukor A, de Jonge B. Structure, Governance, and Organizational Dynamics of University Medical Centers in the Netherlands. Academic Medicine. 2010;85(6):1091-7.
25. NFU Feiten en Cijfers. [Internet]. Available from https://www.nfu.nl/nfu/feiten-en-cijfers. [Last accessed 2023-10-28].
26. STZ Ziekenhuizen. Topklinische Ziekenhuizen; pijlers en kernthema's (Top clinical hospitals; pillars and key themes 2020). 19174 STZ - A5 Highlight-boekjes_Binnenwerk_v9.indd. [Internet] Available from https://www.stz.nl/assets/files/highlight-boekjes-v9-web.pdf. [Last accessed 2023-10-28].
27. DHD Zorg voor Data. ZOOM oktober 2023. Productiecijfers onder de loep - DHD. [Internet]. Available from https://www.dhd.nl/producten-diensten/bedrijfsvoering-financien/productie cijfersonder- de-loep. [Last accessed 2023-10-28].
28. Wet op het Hoger onderwijs en Wetenschappelijk onderzoek .[Internet]. Available from https://wetten.overheid.nl/BWBR0005682/2021-10-01. [Last accessed 2024-03-31].
29. Wet Marktordening Gezondheidszorg [Internet] Available from https://wetten.overheid.nl/BWBR0020078/2021-07-01. [Last accessed 2022-04-03].
30. Bruins B. Positionering academische ziekenhuizen 2006. [Internet]. Available from https:// zoek.officielebekendmakingen.nl/kst-26275-4.pdf. [Last accessed 2022-08-10]
31. Borst-Eilers E, Hermans LMLHA. Positionering academische ziekenhuizen 1998 [Internet] Available from https://www.parlementairemonitor.nl/9353000/1/j9vvij5epmj1ey0/vi3ah7v3lezl [Last accessed 2022-04-03].
32. Rathenau Institute. De Nederlandse Universitair medische centra. Feiten & Cijfers 12 2014. [Internet]. Available from https://www.rathenau.nl/sites/default/files/Feiten_en_cijfers_- _de_Nederlandse_universitair_medische_centra_-_Rathenau.pdf [Last accessed 2023-10-29].
33. Nederlandse Federatie van Universitair Medische Centra. ROBIJN. [Internet]. Available from https://www.nfu.nl/themas/bestendig-zorgstelsel/robijn. [Last accessed 2022-08-11].
34. Nederlandse Zorgautoriteit. Afspraken over beschikbaarheidsbijdrage academische zorg. [Internet]. Available from https://puc.overheid.nl/nza/doc/PUC_8773_22/1/. [Last accessed 2023-10-29].
35. Schippers E. Positioneringsnota UMCs 2014. [Internet]. Available from https://open.overheid.nl/ documenten/ronl-archief-36d43656-fc9b-4073-9c20-dc3bdc308837/pdf. [Last accessed 2022-04-03].
36. Wietecha M, Lipstein SH, Rabkin MT. Governance of the academic health center: striking the balance between service and scholarship. Acad Med. 2009;84(2):170-6.
37. Wartman SA. Toward a Virtuous Cycle: The Changing Face of Academic Health Centers. Academic Medicine. 2008;83(9):797-9.

38. Weiner B, Culbertson R, Jones R, Dickler R. Organizational Models for Medical School—Clinical Enterprise Relationships. Academic medicine : journal of the Association of American Medical Colleges. 2001;76:113-24.

39. Jeurissen P, Maarse H. The market reform in Dutch health care: Results, lessons and prospects. Copenhagen (Denmark)2021.

40. DeAngelis CD. The plight of academic health centers. JAMA. 2000;283(18):2438-9.

41. Fein R. The academic health center - Some policy reflections. Jama-J Am Med Assoc. 2000;283(18):2436-7.

42. Porter ME, Lee TH. Why strategy matters now. N Engl J Med. 2015;372(18):1681-4.

43. Jonge Hde. Toekomstige organisatie van zorg voor patiënten met aangeboren hartafwijkingen. [Internet}. Available fro mhttps://www.rijksoverheid.nl/documenten/kamerstukken/2021/12/20/kamerbrief-over-toekomstige-organisatie-van-zorg-voorpatienten- met-aangeboren-hart afwijkingen [Last accessed 2022-04-03].

44. Nederlandse Zorg Autoriteit. Concentratiebesluit Prinses Maxima Centrum voor Kinderoncologie (Merger decision Princess Maxima Centre for Paediatric Oncology, 2021). [Internet]. Available from https://puc.overheid.nl/nza/doc/PUC_643344_22/1/. [Last accessed 2022-04-03].

45. Raad voor de Volksgezondheid en Zorg 2008. [Internet] Available from https:// www.raadrvs.nl/documenten/publicaties/2008/05/14/schaal-en-zorg . [Last accessed 2022-04-03].

46. Zulick L. Changes in Quality of Care after Hospital Mergers and Acquisitions. N Engl J Med. 2020;382(19):1867.

47. Kristensen T, Bogetoft P, Pedersen KM. Potential gains from hospital mergers in Denmark. Health Care Manag Sci. 2010;13(4):334-45.

48. Azevedo H, Mateus C. Cost effects of hospital mergers in Portugal. Eur J Health Econ. 2014;15(9):999-1010.

49. Baumgartner FR, Breunig C, Green-Pedersen C, Jones BD, Mortensen PB, Nuytemans M, et al. Punctuated Equilibrium in Comparative Perspective. American Journal of Political Science. 2009;53(3):603-20.

50. Baltesen F. Zorgsector moet minder kijken naar eigen belangen. [Internet]. Available from https://www.skipr.nl/nieuws/kuipers-zorgsector-moet-minder-kijken-naar-eigenbelangen/ [Last accessed 2023-10-29].

51. Wetenschappelijke Raad voor het Regeringsbeleid. Kiezen voor houdbare zorg 2021 [Internet]. Available from https://www.wrr.nl/publicaties/rapporten/2021/09/15/kiezen-voorhoudbare-zorg [Last accessed 2023-10-29].

52. Ministry of Health . Integraal Zorgakkoord: Samen werken aan gezonde zorg 2022. [Internet]. Available from https://www.rijksoverheid.nl/documenten/rapporten/2022/09/16/ integraal-zorgakkoord-samen-werken-aan-gezonde-zorg. [Last accessed 2023-10-29].

53. Kvale S. Validity in the qualitative research interview. Psykologisk Skriftserie Aarhus. 1987, 12(1), 68–104.

54. Noble H, Smith J. Issues of validity and reliability in qualitative research. Evidence Based Nursing. 2015;18(2):34.

55. Cardinaal EMM, Duighuisen HNW, Jeurissen PPT, Berden H. Inventory and analysis of literature on the organisation of eight European academic medical centres-A scoping review. PLoS One. 2023;18(3):e0282856.

56. Cardinaal E, Dubas-Jakobczyk K, Behmane D, Bryndova L, Cascini F, Duighuisen H, et al. Governance of academic medical centres in changing healthcare systems: An international comparison. Health Policy. 2022.

Supporting information

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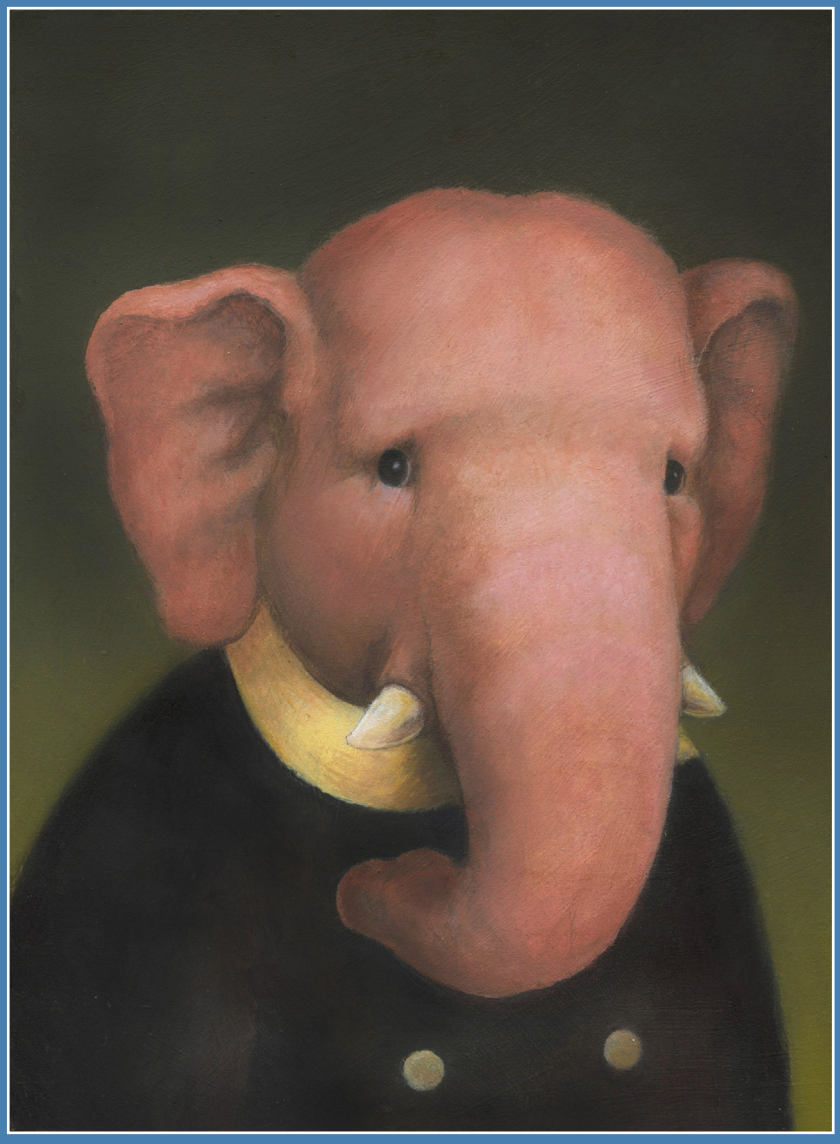
- Supplementary File 1 COREQ Checklist
- Supplementary File 2 Overview of participants
- Supplementary File 3 Introduction to the interviews
- Supplementary File 4 Funding structure Dutch AMCs



Chapter 6

General discussion

6.1 The context

Globalisation, complexity and organisational change set the context for healthcare in the 21st century. External dynamics, such as global talent shortages, cross-border mobility and fierce competition for healthcare professionals, and internal dynamics, such as an ageing, multi-generational workforce and the changing nature of healthcare organisation and governance structures, are affecting the healthcare organisations [1]. This also applies to the organisation and governance of academic medical centres (AMCs), the object of this dissertation. A combination of social, scientific and economic forces is forcing AMCs to rethink traditional approaches to training the next generation of health professionals, conducting biomedical and clinical research, and providing comprehensive and advanced patient care [2]. Becker et al. illustrated this in 2010 by comparing the dynamics in which AMCs find themselves with the extinction of the dinosaurs:

> *"Health care delivery in academic health centres (AHCs) can be seen as dinosaur-like. Both are large and complex entities that consume many resources and are slow to adapt to predatory competitive forces. The potential for severe climate shifts, with changes in payer mix, competition from the private sector, and health care reform, all occurring in the current health care system, could either precipitate the beginning of the extinction of the AHC dinosaur or, hopefully, stimulate its evolution and development into a new model of health care delivery" [3].*

Dutch AMCs have been regularly scrutinised by policymakers, who have called for greater transparency and efficiency. The Ministerial memorandum 'Positioning Academic Hospitals' (Positionering academische ziekenhuizen) of 2 November 1998 reflected all the agreements made with Ministers in previous years about the functioning and development of academic hospitals [4]. It is about the desirability of more coherent management by medical faculties and academic hospitals. About the leading role of academic centres in building networks, the division of tasks between academic centres and the concentration of top-level care and research. Another position paper was published eight years later, in 2006, at the same time as a major change took place with the introduction of the Health Insurance Act. The aim of this new Act was to obtain a higher return from the healthcare providers. The AMCs

were given an exceptional position. The Minister argued that top referral care and innovative development cannot be left to the market: the market and public interest are not necessarily aligned when it comes to a guaranteed supply of top quality care. At the same time, the Minister called for vigilance to ensure that AMCs do not obstruct market forces, for example by using their extra funding to compete unfairly with other healthcare institutions [5]. In 2012, a spending review found that it was not sufficiently clear how AMCs were spending public money and whether they were doing their job effectively [6]. A further positioning note on AMCs was published in 2014, which took the results of the spending review as a starting point and called on AMCs to be more efficient and to share and concentrate functions among themselves. In 2019, the Minister devoted a note to the social role of AMCs, reaffirming the special position of AMCs in the performance of public functions, but also emphasising that this position entails rights and responsibilities. This note on greater regional anchoring and cooperation was in line with those previously written to AMCs in 1998, 2006 and 2014.

A critical note from the Minister of Health: "I expect both AMCs and hospitals to step out of their own shadows and put patients' interests first, keeping a close eye on the balance between quality, accessibility and affordability" [7].

6.2 Four studies, two goals

AMCs are forced to adapt to changing circumstances. However, their size and complex governance models make them inflexible and difficult to adapt. To understand the nature and extent of these problems, a scoping review mapped the organisation and governance of European AMCs. This was complemented by data from a survey of the organisation and governance of European AMCs. Next, findings from a survey of all Dutch AMCs on the use of business models in general and the use of business models as a tool for change in particular were added to provide insights and ways to improve the flexibility and adaptability of AMCs. Finally, in-depth interviews explored why small changes take place in Dutch AMCs and whether more radical changes might be better to cope with changing circumstances.

6.3 Main findings

6.3.1. Scoping review

Although AMCs, with their innovative and academic nature, are important players in the healthcare landscape, little research has been done on the organisation and governance of these complex organisations. The findings of the scoping review filled part of this knowledge gap. It provided insight into the relationship between the university/medical school and the academic medical centre, the organisation of the board and the governing body, and the legal ownership of eight European AMCs representing a cross section of European AMCs. The organisational design and governance of AMCs is influenced by contextual factors such as the political environment, demographics and size. The organisation of AMCs in the eight countries studied showed meta-level similarities in terms of the relationship between universities and AMCs, the role of the dean, and the public ownership of the medical school and the AMC. Most countries have separate governing bodies and legal entities for the medical school and the hospital, have a dean who simultaneously plays a role in the organisation of both the medical school and the hospital, and prefer a functionally integrated relationship between the medical school and the hospital. However, the organisation of AMCs in the eight countries appears to differ in terms of why a particular organisational and ownership structure is chosen. Several factors influence the choice of a particular organisational and legal structure, including internal and external circumstances, challenges and objectives. However, no universal model for an AMC organisation was identified (apart from some meta-level similarities). On the basis of this study, no explanation can be given for the diversity of these models.

6.3.2 European comparison

The results showed that there are no standardised definitions of AMCs. However, most of the participating countries have systems of not-for-profit public ownership of both AMCs and medical schools, and foresee further functional integration in the future. Significant differences were found in the way medical schools and universities organise their relationships in AMC contexts and in the balance between the three core functions - patient care, research and teaching. Next, the results showed that the main internal challenges focus on the inability to respond to change and ongoing financial conflicts between the three core functions. Key external challenges were identified in relation to financial sustainability and staff shortages.

6.3.3 Business models in Dutch AMCs

A business model can support the complex organisation of an AMC, but the design and use of business models varies. The study shows that there is more potential in using a business model than is realised in day-to-day management practice. In particular, a business model is seen as a tool with the potential to guide change. But this appears to be rarely used in the practice of AMCs.

6.3.4 Dutch AMCS: Muddling through or radical change

Whether the current incrementalism in the organisation and governance of Dutch AMCs can be broken by radical changes, and in what context these changes could take place, was the subject of the fourth study. The first part of the research question, breaking incrementalism through radical changes, was not answered. This was related to the second part of the research question, namely that there is currently no context in which a robust discussion about radical change could take place. The focus of the findings is therefore on the second part of the research question; the context in which a discussion about radical change is or is not taking place now and could take place in the future. This study identified nine factors that hinder the governance and cooperation between Dutch AMCs, as well as the cooperation between AMCs and other hospitals. Organisational complexity, a lack of mutual trust and common interests, and perverse systemic incentives prevent a substantive debate about forms of cooperation and the position or number of AMCs in the Netherlands. Incumbent AMC leaders find it difficult to subordinate the interests of their own organisation to the general interest. Under the current circumstances, AMC leaders are unlikely to be able to initiate major changes on their own and will continue to muddle through. A number of conditions need to be in place before sensitive discussions about (radical) change can take place. Ideally, the government should take the lead in creating conditions that foster mutual trust and common interests among AMCs and between AMCs and other hospitals. This should lead to an environment in which AMC leaders can discuss change and feel safe to put the common interest above the interest of their own organisation. According to punctuated equilibrium theory, for example, the government can act as a facilitator of external disturbances to ensure a new equilibrium. However, it depends on the political will and dominant ideology in parliament whether any government is prepared and able to take up such a leading role for a longer period of years.

6.4 Comparison with literature

> *"Health care is a terminal illness for America's governments and corporations. We are in deep trouble. The rest of the world isn't far behind," Christensen et al. [8]*

Christensen et al. base their alarming observation on the rising cost of health care, which was around 7% of GDP in the USA in 1970 and 19.7% by 2020 [9]. Indeed, the rest of the world is not far behind. In a preliminary study on the future development of health care costs, the 'National Institute for Public Health and the Environment' (Rijksinstituut voor Volksgezondheid en Milieu (RIVM)) concludes that Dutch health care costs will continue to increase by 2.8% per year until 2060 [10]. The 'Scientific Council for Government Policy' (Wetenschappelijke Raad voor het Regeringsbeleid) predicts that health care costs will triple by 2060. In the Netherlands, 13% of national income is now spent on health care and this will rise to 20% if no measures are taken [11]. In addition, the patient population is ageing, with more patients suffering from multiple chronic diseases, and the healthcare sector is facing a global shortage of healthcare workers. This shortage is expected to increase in the coming years. In the Netherlands, it is predicted that there will be 140,000 vacancies in the healthcare sector by 2031 [12]. The burning platform is recognised. Solutions are being sought at an organisational level in the form of a new business model or organisational model [13-15]. This research reveals several bottlenecks in the organisation and governance of AMCs. Limited adaptability to changing circumstances is one of the main challenges for the organisation and governance of AMCs. This conclusion is particularly relevant at a time when change is necessary for survival. The next section explores possible solutions by comparing the findings of the study with the theory of systems thinking and disruptive innovation on the one hand, and the theory of evolution and punctuated equilibrium on the other.

6.4.1 Systems thinking

The governance and organisation of AMCs is complex [16]. And although different in terms of cultural and historical context and internal and external organisation, European AMCs face similar challenges in terms of internal (inability to respond to change and persistent financial conflicts between the three core functions) and external (financial sustainability and staff shortages) factors affecting their organisation and governance [17]. AMCs

and their leaders are aware that today's changes require them to adapt. The organisation and governance of AMCs are being challenged from a number of perspectives. AMCs and their leaders are forced to anticipate rising costs of technology and medicines, a changing patient population, staff shortages, and competition from other healthcare providers. Tensions in governance are exacerbated by the fact that these leaders want to maintain their own position of power while facing increasing complexity in multiple partnerships [18]. To bring order to the complexity that AMC leaders experience in managing their organisations, they should rethink their organisational model. Chapter 1 outlines different perspectives on the use of organisational models. Weiner et al. provide a theory for defining AMC organisational models. AMC leaders can use this to see how their current organisation relates to the theory [14]. Kirch identifies critical success factors that leaders can use to see if they are on the path to a successful transformation [18]. Chari provides a framework for measuring the strengths and weaknesses of AMC governance approaches, and even sees opportunities to use this analysis to explore alternative governance approaches [19]. The tools to bring about organisational change in an AMC are primarily internally focused. To build an organisation that can respond flexibly and in a timely manner to changing circumstances it would be advisable to involve the external world more explicitly in making AMC governance more flexible. Systems thinking is a perspective that recognises systems as collections of components, all of which are interrelated and necessary, and whose interrelationships are at least as important as the components themselves [20]. Systems thinking offers the opportunity to turn chaos into order by simplifying, without ignoring, the complexity of managing AMCs. Using a systems perspective, the complexity of managing an AMC can be broken down into smaller parts, such as highly complex patient care, research and education. These parts can be used to examine how the context and actors react and interact with each other. This makes it easier and quicker to design and evaluate interventions, thus achieving a more flexible organisation. In practice, this is difficult because it simplifies day-to-day practice. And there is a risk of losing sight of the bigger picture. This foray into systems thinking is an invitation to look at an organisation in a different way. Rusoja et al. link systems thinking and complexity science on the basis that health and health systems are made up of dynamic actors that are constantly evolving in response to each other and their context. However, there is no direction, agreement or infrastructure for how these actors should or could communicate with each other about the common challenges they face [21]. No one seems to have the tools to initiate systemic change. Nor is it easy. With only practical

examples from the past, the challenges lie in the future. Moreover, which body has sufficient voice and power to transform the different parts of the system? Which body is willing and able to take the lead? The research shows that the relationship between AMC leaders themselves, but also between AMC leaders and general hospital leaders, is fraught with competition and mistrust. This is partly due to perverse incentives in the funding system. The research found support for more government control of systemic change. Perhaps this is one way forward.

6.4.1.1 Systems thinking and disruptive innovation

Systemic change requires a rigorous approach. It requires courage and daring on the part of leaders; it requires letting go of the familiar for the greater good. Christensen et al use disruptive innovation as a means to achieve transformation. They believe that examples from commercial sectors are applicable to healthcare and distinguish three pillars. To start with, a technological enabler is needed to simplify and routinise the solution to problems that previously required unstructured processes. Then, a business model type of innovation must be developed to make the simplified solutions profitable and more affordable. And finally, a value network, where the different organisations in the network have similarly disruptive, mutually reinforcing business models [22]. New laws and regulations are needed to facilitate new relationships in the face of disruptive change. This touches on the systems thinking perspective of systems as collections of components, all interrelated and necessary, and whose interrelationships are at least as important as the components themselves [20].

6.4.1.2 Systems thinking, disruptive innovation and leadership

This research shows that the competitive environment in which AMCs and their leaders operate is potentially limiting their effectiveness and efficiency. Relationships among AMC leaders and between AMC leaders and general hospital leaders are described in the in-depth interviews as distrustful and highly competitive. Research shows that leadership, trust and relationships are more important than structure and process in effective decision making. A governance system can function with imperfect structures and processes, but if leadership is lacking and relationships and trust are damaged, the governance system is likely to fail because of a lack of direction, motivation, meaning, integrity, a sense of common purpose, ways of integrating different perspectives, open communication, people willing to listen, and legitimacy [23].

Kirch et al. conclude: "There is no major obstacle other than the inherent human resistance to change" [18] .

Systems thinking provides a guide to identifying the relationships within a system. But this is not enough to bring about change within the system. The entrenched business models of the current system must be rigorously involved in bringing about change. For the leaders of AMCs, this means showing leadership and demonstrating their ability to embrace collectively disruptive, mutually reinforcing economic models. They must subordinate 'individual' organisational interests to the interests of the greater whole. However, this research shows that they face barriers in current laws, regulations and funding structures. AMC leaders indicate that they appreciate and need the government to provide the necessary guidance to make the healthcare system sustainable. For the time being, the Dutch government is staying in the background, leaving the responsibility for change to the AMCs [24]. To kick-start the change process, the government itself could (or should?) show leadership and rethink this strategy and ensure that it facilitates the change process with laws and regulations to soften the competitive relationship between AMCs on the one hand and between AMCs and regular hospitals on the other. An interesting question is why the healthcare sector has had limited success in being disruptive. There is no doubt that healthcare has proven to be an extremely difficult sector to disrupt in a meaningful way. In 2018, Amazon, Berkshire Hathaway and JP Morgan Chase came together to form a new company called Haven with the aim of disrupting healthcare. However, just three years after Haven's launch, its respective leaders decided it was time to pull the plug:

"Healthcare pundits were excited about the potential disruption the company (Amazon, Berkshire Hathaway and JP Morgan Chase, red) would bring to the industry. Now, with the surprising news of Care's closure, those same pundits are asking: "is healthcare really that hard to disrupt? [25]"

6.4.2 Theory of evolution

In the prologue I explained why I use the elephant metaphor. The first paragraph of this chapter compares AMCs to dinosaurs; a nice bridge to evolutionary theory and the link to this research on the governance and organisation of AMCs. Since time immemorial, elephants have made a huge

impression on people because of their sheer size. Not to mention the sight of the mammoth, which must have been overwhelming. The two species of elephants we know today evolved from a group of animals (Condylarthra) that had many different forms. Depending on the conditions, the animals evolved into a form in which they could survive [26]. Some of them evolved into elephants others into mammoths. Mammoths became extinct, most likely because the mammoth failed to adapt to changing conditions in time. Former president of the Dutch 'Federation of University Medical Centres' (Nederlandse Federtie van Universitair Medische Centra (NFU)) Jacques Landman wrote in a booklet on the occasion of his retirement (2022):

"Due to the combination of patient care, education and research, the AMCs occupy a special position in the Dutch healthcare landscape: they are a sui generis or 'special animal species' [27]." Let's compare an AMC to the mammoth and the dinosaur: a large and impressive hospital that, according to the research findings, is struggling to adapt to changing circumstances. This comparison gives us the legitimacy to explore further whether evolutionary theory can provide us with insights that might help to improve the adaptive capacity of an AMC.

6.4.2.1 Theory of evolution and muddling through

The Greek Anaximander (610-546 BC) believed that all life originated in water and that sea creatures had come ashore and adapted to life on land. Zeno of Citium (c. 334-262 BC) added that all life had a fixed function and that nature sought 'the structure that can best survive'. But when it comes to the theory of evolution, we are most familiar with the biologist Charles Darwin, who caused a sensation in 1859 with the publication of his book "On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life", in which he proposed the theory that all living things descended from a common ancestor and that species arose through natural selection, the survival of the fittest [28]. Back to the comparison between AMCs, dinosaurs and mammoths. All are complex entities, large relative to other parties in the habitat. Both consume huge amounts of resources to survive. 66 million years ago, dinosaurs became extinct because they could not find a way to adapt to an environment with less sunlight and plants. Mammoths died out 4,000 years ago because climate change turned grasslands into forests. This meant that large amounts of grass, the

mammoth's main food, disappeared. The animal was unable to adapt its diet and was doomed to extinction. Like dinosaurs and mammoths, AMCs need to survive in the face of "climate" changes such as an ageing patient population, rising (technology) costs, staff shortages and new predators, as well as trends such as competition from the private sector.

Scientists agree that evolution is not limited to biology but is also present in other systems. An organisation can be treated as a living system and evolutionary theories can be used to understand and perhaps influence how the organisation changes over time [29].

This paragraph began by saying that healthcare is a terminal disease for governments and corporations and that we are in big trouble if we continue along the current path. To paraphrase Darwin, healthcare has entered a struggle for life. Internal and external developments require healthcare organisations in general, and AMCs in particular, to evolve, learn, adapt and innovate in order to survive. Since their establishment in the 1980s, politicians and other stakeholders have raised questions about the effectiveness of Dutch AMCs [4-5, 30-31]. Critics question whether AMCs are sufficiently different from other hospitals to justify their separate funding. Not least from the leaders of the larger non-academic hospitals, who argue that they perform a similar range of functions but do not receive the extra funding to do so. The institutional complexity of AMCs makes them difficult to manage. Our research findings (Section 6.3.4) show that limited mutual trust between AMCs and among AMCs and other health care providers, a lack of shared interests and perverse system incentives prevent substantive debate in which the interests of one's own organisation can be subordinated to the public interest. As a result, there is insufficient fertile ground for major, principled change in the healthcare system, and organisations continue to tread the familiar path of marginal change. Organisations that do not adapt to changing circumstances become victims of the natural selection of market forces.

6.4.2.2 Theory of evolution, punctuated equilibrium and radical change

Between 2012 and 2020, the total annual amount of care provided in Dutch AMCs decreased, possibly by transferring non-complex care to general hospitals. This is reflected in the key figures: number of visits, admissions and days of care per year. The number of employees in the AMCs will increase. The turnover of Dutch AMCs for healthcare services has increased by 40% in recent years [32]. These developments run

counter to the trend in recent years towards organisational "flattening", the tendency to shrink the organisational structure. Organisational growth tends to be slow, sometimes over long periods of time, flattening tends to be abrupt and therefore painful [33]. Perhaps AMCs will stick to slow, incremental change (muddling through) to avoid this pain. Incremental change occurs when only the more marginal levels of the structure are affected. Revolutionary change occurs when the fundamental levels of the structure are reconfigured, as well as all the more marginal levels within them [34]. To cut through the muddle and bring about radical change, the punctuated equilibrium model of discontinuous change, for example, suggests that systems can be relatively stable for long periods, but punctuated by short periods of rapid change. Recently, Louise Gunning-Schepers (NFU President 2008-2010) referred more or less to a moment in the existence of AMCs when there was such a revolutionary spirit of action. She recalled that when every academic hospital had more or less become an AMC, policymakers in The Hague looked critically at whether different AMCs were unnecessarily doing the same things. The NFU decided to produce management information showing that there was little overlap between AMCs, both in patient care and research. "*That's when we came up with the idea of one AMC in eight locations (.....), it turned out to be a bridge too far for the AMCs.*" [27]. A parallel can be drawn between the situation of AMCs and that of urban health, as studied by Liu et al. 2021 [35]. Liu et al. investigated why human societies have not collectively adapted better to the challenges of urbanisation and global environmental change. Their research found that systems evolve into superorganisms that prefer to maintain themselves as a whole rather than look at the bigger picture. These superorganisms become dominant, making the system less creative, flexible and resilient. One might even say that they will duly turn into extinct types of elephants and mammoths and tend to follow a reverse evolutionary path, with an obvious catastropic ending. This is in line with the findings of this research that AMCs, being large complex organisations, find it difficult to make decisions that may go against their own interests and find it difficult to be flexible in their adaptability to meet the contemporary challenges mentioned above.

6.5 Implications

6.5.1 Cooperation

The momentum is there to tackle the problems of rising healthcare costs, increasing workforce shortages and the increasing number of patients with multiple chronic conditions. The burning platform has been fuelled in recent years by massive inflation, the climate crisis and the aftermath of a two-year pandemic that has strained the healthcare system. Under these circumstances, the 'Integral Care Agreement' (Integraal Zorgakkoord) was signed in the Netherlands in 2022 [36]. In it, the Ministry of Health and numerous stakeholders in the healthcare sector agreed to join forces to keep high quality healthcare accessible and payable in the future. The current Dutch healthcare system has healthcare providers with different forms of financing and different legal frameworks. This leads to fragmentation and bureaucracy and makes it difficult for these providers to work together. This agreement calls on all parties to "bring about a radical change in the Dutch healthcare system and in society's view of healthcare". Not only healthcare providers participate in the agreement, but also patient groups, healthcare insurers, municipalities, and the ministry of health. This fits well with systems thinking, which breaks down the complexity of healthcare into smaller parts. These smaller components can be used to explore how the context and the actors react and interact with each other to bring about change. Is this enough to bring about fundamental change as mentioned in punctuated equilibrium theory? Are the measures in the IZA indeed radical, and radical enough to be disruptive? Or is this old wine in new bottles and fits the perspective of muddling through?

6.5.2 Organisational design

Based on the results of this study, it is questionable whether AMCs, due to their complex design, can be considered capable of effectively combining patient care, research, education and training with public functions. As an alternative to the current design of AMCs, more radical and disruptive thinking might be desirable. In 1980, Hastings researched appropriate models for the organisation and governance of AMCs [37]. He concluded that the variation and complexity of these organisations makes it impossible to give an unequivocal answer here. But as a handle for decision-making, he suggested a yardstick, a continuum, along which decision-making could take place. This continuum magnifies problems, sets extremes against each other to better zoom in on the issues and solution directions. This perspective

was used in this study to ask various high-level stakeholders in in-depth interviews what the Dutch healthcare landscape would look like if there were only one AMC instead of the current seven. Could a reduction in the number of AMCs or the division of academic tasks between them contribute to their financial sustainability, flexibility, resilience and agility? For example, through the retention of only those sites where there is a high level of specialisation. Or by taking stock of the overall healthcare landscape of hospitals, independent treatment centres and clinics and reducing the number of organisations. For example, a limited number of AMCs that focus only on clinically innovative, cutting-edge care, while transferring other care to day-care and 24-hour centres. Even more disruptive would be a healthcare landscape with only one AMC with national distribution through, for example, academic departments in other (top clinical) hospitals. Such a structure would ensure a sufficient number of patients for research and education, as well as concentrating scarce resources and joining forces. Exciting, but still much to think about and discuss ... Recently, former NFU president Louise Gunning-Schepers, in a booklet quoted here earlier, on the occasion of her successor's farewell, called on AMCs and their leaders to seriously consider what benefits one AMC could have for the Netherlands. Obviously, it is important to provide comfort to all parties and debate this carefully. It is necessary to create an environment with safeguards, so that the delicate discussion can take place.

Radical change requires courage and determination on the part of everyone involved, especially the AMC leaders. Or as the Dutch Minister of Health said in an interview:

> *"The individualistic attitude of health administrators and the large number of health parties are the weakness of the system." (...)"Healthcare parties should work less for themselves" [38].*

It now requires leadership from all stakeholders to let go of old beliefs, attitudes and positions and to work together on a sustainable health system. It is necessary to create an environment, with safeguards, so that the delicate discussion can take place.

This dissertation has provided an initial exploration of the governance and organisation of AMCs. It is worth exploring further which approach would benefit healthcare the most; a more incremental or a more radical approach.

References

1. Turner P. The Changing Landscape of Healthcare. In: Turner P, editor. Talent Management in Healthcare: Exploring How the World's Health Service Organisations Attract, Manage and Develop Talent. Cham: Springer International Publishing; 2018. p. 15-37.
2. Wartman SA. Chapter 25 - Academic Health Center Transformation: Future Shock or Future Success? In: Wartman SA, editor. The Transformation of Academic Health Centers. Boston: Academic Press; 2015. p. 253-60.
3. Becker BN, Formisano RA, Getto CJ. Commentary: dinosaurs fated for extinction? Health care delivery at academic health centers. Acad Med. 2010;85(5):759-62.
4. Borst-Eilers E, Hermans LMLHA. Positionering academische ziekenhuizen 1998. [Internet]. https://www.parlementairemonitor.nl/9353000/1/j9vvij5epmj1ey0/vi3ah7v3lezl. [Last accessed 2022-04-03].
5. Hoogervorst JF. Positionering academische ziekenhuizen 2006. [Internet]. Available from https://zoek.officielebekendmakingen.nl/kst-26275-4.pdf. [Last accessed 2022-08-10].
6. Schippers E. Interdepartementaal Beleidsonderzoek Universitair Medische Centra (UMC's) (2012-05-23). [Internet]. Available from: https://www.parlementairemonitor.nl/9353000/1/j9tvgajcovz8izf_j9vvij5epmj1ey0/vizxe96bffxk. [Last accessed 2024-03-30].
7. Bruins B. Maatschappelijke rol van umc's in het medisch zorglandschap 2019. [Internet]. Available from https://www.tweedekamer.nl/kamerstukken/brieven_regering detailid=2019Z15053&did=2019D30930. [Last accessed 2022-04-03].
8. Christensen CM. The innovator's prescription : a disruptive solution for health care: New York: McGraw-Hill, [2009] ©2009; 2009.
9. U.S. national health expenditure as percent of GDP from 1960 to 2020. [Internet]. Available from https://www.statista. com/statistics/184968/us-health-expenditure-as-percent-of-gdpsince-1960/ . [Last accessed 2024-03-31].
10. Rijksinsitituut voor Volksgezondheid en Milieu. Toekomstverkenning zorguitgaven 2015-2060. [Internet]. https://www.rivm.nl/bibliotheek/rapporten/2020-0059.pdf. [Last accessed 2022-09-11].
11. Wetenschappelijke Raad voor het Regeringsbeleid. Kiezen voor houdbare zorg 2021. [Internet]. Available from: https://www.wrr.nl/publicaties/rapporten/2021/09/15/kiezen-voor-houdbarezorg. [Last accessed 2024-03-31].
12. ABF Research. Arbeidsmarktprognose Zorg en Welzijn 2021-2035, 2022. [Internet]. Available from: https://abfresearch.nl/publicaties/arbeidsmarktprognoses-zorg-enwelzijn-2021/. [Last accessed 2024-03-31].
13. Wartman SA. Toward a Virtuous Cycle: The Changing Face of Academic Health Centers. Academic Medicine. 2008;83(9):797-9.
14. Weiner B, Culbertson R, Jones R, Dickler R. Organizational Models for Medical School—Clinical Enterprise Relationships. Academic medicine : journal of the Association of American Medical Colleges. 2001;76:113-24.
15. Siewert JR. The surgical university hospital: perspectives in the 21st century. American Journal of Surgery. 2007;194(4a):S162-S4.
16. Wietecha M, Lipstein SH, Rabkin MT. Governance of the academic health center: striking the balance between service and scholarship. Acad Med. 2009;84(2):170-6.

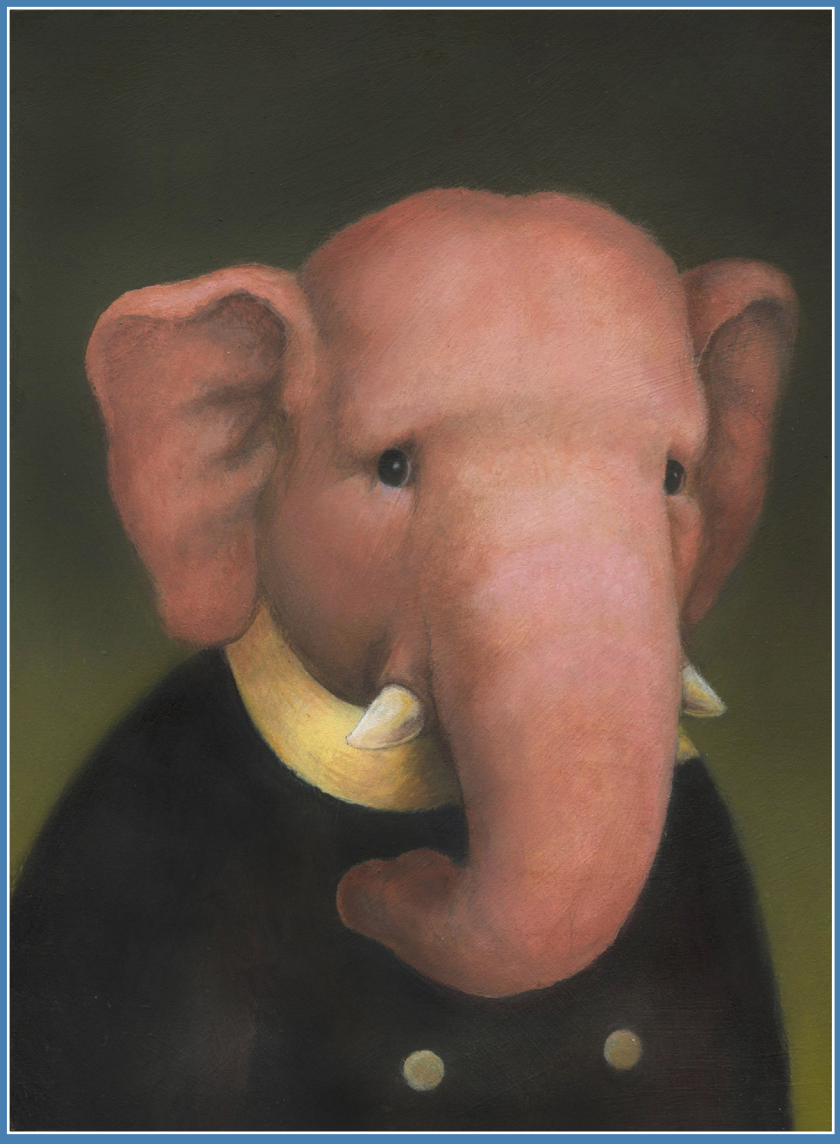
17. Cardinaal E, Dubas-Jakobczyk K, Behmane D, Bryndova L, Cascini F, Duighuisen H, et al. Governance of academic medical centres in changing healthcare systems: An international comparison. Health Policy. 2022.
18. Kirch DG, Grigsby RK, Zolko WW, Moskowitz J, Hefner DS, Souba WW, et al. Reinventing the academic health center. Academic Medicine. 2005;80(11):980-9.
19. Chari R, O'Hanlon C, Chen P, Leuschner K, Nelson C. Governing Academic Medical Center Systems: Evaluating and Choosing Among Alternative Governance Approaches. Acad Med. 2018;93(2):192-8.
20. Amissah M, Gannon T, Monat J. What is Systems Thinking? Expert Perspectives from the WPI Systems Thinking Colloquium of 2 October 2019. Systems-Basel. 2020;8(1).
21. Rusoja E, Haynie D, Sievers J, Mustafee N, Nelson F, Reynolds M, et al. Thinking about complexity in health: A systematic review of the key systems thinking and complexity ideas in health. J Eval Clin Pract. 2018;24(3):600-6.
22. Stabell CB, Fjeldstad OD. Configuring value for competitive advantage: On chains, shops, and networks. Strategic Manage J. 1998;19(5):413-37.
23. Kezar A. What is more important to effective governance: Relationships, trust, and leadership, or structures and formal processes? New Directions for Higher Education. 2004;2004(127):35-46.
24. Kuipers EJ. Interdepartementaal Beleidsonderzoek: Universitair Medische Centra (UMC's). [Internet]. Available from https://zoek. officielebekendmakingen.nl/dossier/ kst-33278-12.html. [Last accessed 2022-08-10].
25. Meaningful Healthcare Disruption has Become A Huge Challenge. Forbes 2022. [Internet]. Available from https://www.forbes.com/sites/saibala/2022/08/31/meaningful-healthcare-disruption-hasbecome- a-huge-challenge/. [Last accessed 2024-03-31].
26. De Boer LEM, Sondaar PY. De evolutie van olifantachtigen. Grondboor & Hamer. 1983;37(1):17-31.
27. Nederlandse Federatie van Universitair Medische Centra. Uitgave 'T is een unieke vereniging, en dat is het - van BAZ naar VAZ naar NFU' ter gelegenheid van het afscheid NFU directeur Jacques Landman 2022.
28. Darwin C. On the origin of species by means of natural selection, or preservation of favoured races in the struggle for life: London : John Murray, 1859; 1859.
29. Datta PR, Dey, U.K. Evolutionary approaches to organisational strategy; addressing business dynamism. Journal of Business and Retail Management Research. 2006;1(1):87-94.
30. Schippers E. Positioneringsnota UMCs 2014. [Internet]. Available from https://open.overheid.nl/ documenten/ronl-archief-36d43656-fc9b-4073-9c20-dc3bdc308837/pdf. [Last accessed 2022-04-03].
31. Bruins B. Maatschappelijke rol van umc's in het medisch zorglandschap 2019. [Internet]. Available from https://www.tweedekamer.nl/kamerstukken/brieven_regering detailid=2019Z15053&did=2019D30930. [Last accessed 2022-04-03].
32. Vogelezang RIAVaS. Inkomsten, onderzoek en zorg van de universitair medische centra 2022-03-07 [Available from: https://www.rathenau.nl/nl/wetenschap-cijfers/geld/ inkomsten-uitgaven-van-universiteiten-umcs-en-hogescholen/inkomsten.
33. McConnell CR. Larger, smaller, and flatter: the evolution of the modern health care organization. Health Care Manag (Frederick). 2005;24(2):177-88.
34. Wollin A. Punctuated equilibrium: reconciling theory of revolutionary and incremental change. Systems Research and Behavioral Science. 1999;16(4):359-67.

35. Liu JL, Gatzweiler FW, Kumar M. An evolutionary complex systems perspective on urban health. Socio-Economic Planning Sciences. 2021;75:100815.

36. Ministry of Health . Integraal Zorgakkoord: Samen werken aan gezonde zorg 2022. [Internet]. Available from https://www.rijksoverheid.nl/documenten/rapporten/2022/09/16/integraal-zorgakkoord-samenwerken- aan-gezonde-zorg. [Last accessed 2023-10-29].

37. Hastings DA, Crispell KR. Policy-making and governance in academic health centers. J Med Educ. 1980;55(4):325-32.

38. Baltesen F. Zorgsector moet minder kijken naar eigen belangen 2023. [Internet]. Available from: https://www.skipr.nl/nieuws/kuipers-zorgsector-moet-minder-kijken-naareigenbelangen/. [Last accessed 2024-03-31]



Chapter 7

Summary

Samenvatting

Dank/Words of gratitude

Data management

Portfolio

Curriculum Vitae

SUMMARY

Rationale

AMCs are complex organisations. This is generally due to the size of the organisation, its place in the healthcare landscape and the different core functions within one organisation. Or as Peter Drucker once said in an interview: "Even small healthcare institutions are complex, almost unmanageable places... Large healthcare institutions may be the most complex organisations in the history of mankind". AMCs are large and leading healthcare organisations with particularly complex governance due to the simultaneous execution of three core missions: patient care, research, and education and training. Little research has been conducted on the complexity of AMC organisation and governance. The aim of this dissertation was to provide more insight into how and in what context an AMC is organised, what bottlenecks they face and what future trends can be expected in terms of their governance and organisation. This study is an exploration of this issue in a European context, with a particular focus on the Netherlands.

Research questions

The complexity in AMC governance and organisation creates organisational and managerial challenges that make it difficult for these organisations to adapt to changing circumstances and ultimately (negatively) affect their speed of action and effectiveness. This dissertation examined the organisation and governance of European AMCs in general, and those in the Netherlands in particular, in order to fill a knowledge gap and provide insight and a better understanding of this topic. The research was conducted in four studies with different research perspectives/questions:

1) Identification and analysis of the available literature regarding the relationship between the university/medical school and the AMC, the organisation of the governing and management body and legal ownership.
2) Comparison of European AMCs in terms of definition of an AMC, characteristics of an AMC, governance of an AMC and future trends and challenges in AMC governance.
3) Applying a business model as such and exploring the use and potential of a business model as a tool to initiate change.
4) Exploration of whether the current incrementalism in AMC governance is reduced by potential radical change, and in what contexts these changes would or would not be possible.

Research design

The first study (Chapter 2) consisted of a literature review, specifically a scoping review of 10 countries, to get an overall picture of the organisation of AMCs in Europe. A second study (Chapter 3) looked in more detail at the differences, similarities and expected trends in the organisation of European AMCs. A survey was conducted among a group of leading experts from the Health Systems and Policy Monitor (HSPM) network of the European Observatory on Health Systems and Policies who have in-depth knowledge and understanding of the organisation and governance of AMCs in their national health systems. The results of the first two studies were followed by two studies focusing on the organisation and governance of AMCs in the Netherlands. The third study (Chapter 4) examined how Dutch AMCs use the potential of business models in their organisation and governance. A survey was conducted among respondents with a key position within an AMC with oversight, experience and executive responsibility for business management. The fourth study (Chapter 5) examined 1) the hypothesis whether the current incrementalism in AMC organisation and governance could be reduced by radical changes and 2) the context in which radical changes would be possible. To this end, unstructured interviews were conducted with a number of high-level stakeholders, including some chairmen of the boards of AMCs and health insurers, a former Minister, a strategic advisor and the director of an umbrella organisation.

Key findings

The scoping review revealed meta-level similarities between European AMCs. Most countries have separate governing bodies and legal entities for the medical school and the hospital, have a dean who also plays a role in the organisation of both the medical school and the hospital, and prefer a functionally integrated relationship between the medical school and the hospital. However, the organisation of AMCs in the eight countries appears to differ in terms of why a particular organisational and ownership structure is chosen. Several factors influence the choice of a particular organisational and legal structure, including internal and external circumstances, challenges and objectives. However, no single model of AMC organisation could be identified (apart from some meta-level similarities) (Chapter 2).

The second study showed that although the basic organisation of AMCs appears similar, there is considerable variation in the way the three core functions are set up. The linkage between (complex) patient care, research

and education in AMCs is rather loose in a number of European countries and there is considerable variation in the organisation and governance of such institutions. There is no common definition for an AMC, but typically the three core functions are coupled. A key differentiator is the degree of formal integration between the hospital and the medical school. This can be complete, as in the Netherlands, but is typically more horizontal, with a strong position for the university. The threshold for becoming an AMC varies from country to country, with Spain appearing to be a country with a slightly lower threshold. The relationship between hospitals and universities varies, but almost all of these institutions are owned by the government or a not-for-profit organisation, which increases the political influence. Leading experts from the European Observatory on Health Systems and Policies' Health Systems and Policy Monitor (HSPM) network concluded in this study that the bottlenecks for the organisation and governance of European AMCs are largely the same. The most frequently cited challenges are financial tensions between the three core functions, financial sustainability, staff shortages, poor knowledge-sharing infrastructure and limited ability to make timely adjustments in response to changing circumstances. The experts in this study see further functional integration as the most logical way forward (Chapter 3).

After the first two European studies, the follow-up studies focused on the Dutch health care system. The starting point was one of the findings from the European comparison: the limited adaptability of AMCs to changing circumstances.

Therefore, the third study focused on the use of business models in Dutch AMCs as a possible means of improving adaptability and initiating change. This study found that a business model can support the complex organisation of an AMC, but the use of business models varies from one AMC to another. Overall, more potential is attributed to the use of a business model than is experienced in day-to-day practice. A business model is seen as an appropriate way to bring about change, but it is not widely used in the day-to-day operations of AMCs (Chapter 4).

The fourth study looked from a different perspective at the factors that might explain the limited ability of AMCs to adapt to changing circumstances. Since their establishment, Dutch AMCs have been the subject of public debate about their unique position and effectiveness. In recent years, the AMCs have failed to make changes that would silence the debate.

This study contrasted so-called incrementalism (muddling through) with radical change, hypothesizing that radical change might be a solution to the current incrementalism, and exploring the conditions under which such change might or might not occur. Unstructured interviews were conducted with a number of high-level stakeholders and issues were identified that negatively affect the organisation and governance of Dutch AMCs: 1) negative undercurrents and unspoken issues due to conflicts of interest, 2) organisational complexity due to relationship between university, AMC and academic medical specialists, 3) lack of sufficient government direction, 4) competition between AMCs due to perverse systemic incentives, 5) different interests, focus and organisational culture, 6) concentration of care (this does not always lead to better quality and efficiency, as the provision of less complex care is of paramount importance for education and research), 7) the infeasibility of the public and regional functions of an AMC, 8) the inefficiency of managing three core functions within the same organisation, and 9) the market regulation of the health care system. This research showed that it is not yet possible to break incrementalism through radical change. There is currently no context in which there is sufficient commitment or readiness to discuss or explore radical change in a robust way. A number of conditions need to be met before sensitive discussions about (radical) change can take place (Chapter 5).

Conclusions and implications

There is little literature on the organisation of European AMCs. The use of national level websites for the scoping review complements the existing literature and provides a more complete picture of the governance and organisation of these organisations. The origins and organisational design of European AMCs vary, but at a meta-level the organisations are similar. Most countries have separate governing bodies and legal entities for the medical school and the hospital, have a dean who also plays a role in the organisation of both the medical school and the hospital, and prefer a functionally integrated relationship between the medical school and the hospital. Interestingly, the initial study also shows that more or less the same organisation, legal structure and functionally integrated relationship between universities and hospitals seems to be preferred. However, there is no single model of AMC organisation (apart from some meta-level similarities). Further research is therefore needed to explain this variation. For example, by generating a set of hypotheses through in-depth case studies that also focus on the context of AMCs. Several factors influence the choice of organisation

and legal structure, including internal and external conditions, challenges and objectives.

The European comparison found a lack of standardised definitions of AMCs and significant differences in the way medical schools and universities organise their relationships in an AMC. However, there is agreement that further functional integration is the logical way forward. In addition, several challenges are perceived to be similar. Such as the key internal challenges, which focus on the inability to respond to change and the ongoing financial conflicts between the three core functions. And the key external challenges, which focus on financial sustainability and staff shortages. To broaden and deepen the knowledge about the organisation and governance of AMCs, further research is warranted. Both policymakers and AMC leaders can use best practices to learn from each other. More than 100 years ago, Flexner encouraged AMCs to learn by walking around: "ambulando discimus". Today, the need to learn from each other is as relevant as ever. The establishment of a European infrastructure for the exchange of AMC knowledge on governance and organisation could be helpful in this respect.

The first two European studies found that one of the main challenges for AMCs is their limited ability to adapt to changing circumstances. The complexity of AMCs contributes to this. This is due to their tripartite mission, the absence of a formal hierarchy and the presence of public functions. This complexity makes it difficult for AMC leaders to respond quickly to change. A case study of Dutch AMCs investigated whether the use of a business model could help increase adaptability to changing circumstances. The use of business models is not uniform across AMCs. However, there is a common recognition of the potential of business models to trigger or support change. As is the observation that this rarely happens in day-to-day practice. It can therefore be assumed that improvements can be made to optimise the potential for change in the business models of AMCs. In order to successfully implement an innovative business model, the interpretation of the concept of a business model and the creation of a framework of preconditions should be taken into account. Healthcare providers, policy makers or researchers should explicitly identify the environment in which the model will operate. Specifically, by identifying change readiness at all levels of the organisation.

Finally, the fourth study examined whether the limited adaptability of AMCs can be explained by an incrementalist approach rather than a more radical

response to changing circumstances. The results of the research show that in the Netherlands it is not yet possible to break through these small steps, called incrementalism, with radical change. It can be concluded that there is currently no context in which there is sufficient commitment to really start talking about possibilities for radical change. A number of conditions need to be met before sensitive discussions about (radical) change can take place. Based on the research findings, it can be concluded that there is support for the government to take the lead in removing perverse systemic incentives to create conditions that promote mutual trust and common interests among AMCs and between AMCs and other hospitals. This should lead to an environment in which AMC leaders can engage with each other to explore opportunities for change. An environment in which they feel comfortable putting the common interest before the interest of their own organisation.

It is hoped that this dissertation will invite stakeholders from all parts of the healthcare chain to let go of old beliefs, attitudes and perceptions and work together to build a sustainable healthcare system. This will make it easier to work together to create an environment in which sensitive explorations and conversations about change can take place.

This dissertation has provided only an initial exploration of the organisation and governance of AMCs. It is worth exploring further whether a more incremental or a more radical approach would be most beneficial to healthcare. It is also recommended that more evidence is gathered on the use of business models to drive change. Perhaps this could be explored in a European context, which could at the same time initiate the strengthening of a European infrastructure for sharing knowledge on the governance and organisation of AMCs.

SAMENVATTING

Inleiding

AMC's (academisch medische centra) zijn complexe organisaties. Dit heeft te maken met de omvang van de organisatie, de plaats in het zorglandschap en de verschillende kernfuncties binnen een en dezelfde organisatie. Of zoals Peter Drucker ooit zei in een interview: "Zelfs kleine zorginstellingen zijn complexe, bijna onbeheersbare instellingen... En academische instellingen zijn misschien wel de meest complexe organisaties in de geschiedenis van de mensheid". AMC's zijn grote en toonaangevende ziekenhuizen met een complex bestuur vanwege de gelijktijdige uitvoering van drie kerntaken: patiëntenzorg, onderzoek en onderwijs en opleiding. Er is weinig onderzoek gedaan naar de complexiteit van de organisatie en het bestuur van AMC's. Het doel van dit proefschrift was om meer inzicht te geven in hoe en in welke context een AMC is georganiseerd, met welke knelpunten deze organisaties te maken hebben en welke toekomstige trends we kunnen verwachten op het gebied van hun bestuur en organisatie. Dit onderwerp is onderzocht in een Europese context, met een bijzondere focus op Nederland.

Onderzoeksperspectieven

De complexiteit van AMC's creëert onder andere organisatorische en bestuurlijke uitdagingen die het voor deze organisaties moeilijk maken om zich aan te passen aan veranderende omstandigheden en die uiteindelijk hun snelheid van handelen en effectiviteit (negatief) beïnvloeden. Dit proefschrift bevat de resultaten van het onderzoek naar de organisatie en het bestuur van Europese AMC's in het algemeen, en die van Nederland in het bijzonder. Met als doel om een kennisleemte op te vullen en inzicht en een beter begrip van dit onderwerp te verschaffen. Het onderzoek werd uitgevoerd in vier studies met verschillende onderzoeksperspectieven/vragen:

1) Identificatie en analyse van de beschikbare literatuur met betrekking tot de relatie tussen de universiteit en het AMC, de organisatie van het bestuursorgaan en het juridisch eigendom.
2) Vergelijking van Europese AMC's op het gebied van definitie van een AMC, kenmerken van een AMC, bestuur van een AMC en toekomstige trends en uitdagingen in AMC-bestuur.
3) Verkenning of een businesssmodel als zodanig wordt herkend en toegepast en of een businessmodel wordt herkend en ingezet als een instrument om verandering te initiëren.

4) Verkenning of het huidige incrementalisme in AMC-governance mogelijk kan worden verminderd door radicale verandering, en in welke contexten deze veranderingen dan wel of niet mogelijk zouden zijn.

Onderzoeksopzet

De eerste studie (Hoofdstuk 2) bestond uit een literatuurstudie, een scoping review waar 10 landen werden geïncludeerd, om een algemeen beeld te krijgen van de organisatie van AMC's in Europa. In een tweede studie (hoofdstuk 3) werden de verschillen, overeenkomsten en verwachte trends in het bestuur en de organisatie van Europese AMC's nader bekeken. Er werd een enquête gehouden onder een groep vooraanstaande deskundigen van het European Observatory on Health Systems and Policies' Health Systems and Policy Monitor (HSPM) network. Deze deskundigen beschikten over diepgaande kennis van en inzicht in de organisatie en het bestuur van AMC's in hun nationale gezondheidszorgstelsels. De resultaten van de eerste twee studies werden gevolgd door twee studies die zich richtten op de organisatie en het bestuur van AMC's in Nederland. De derde studie (hoofdstuk 4) onderzocht hoe Nederlandse AMC's het potentieel van businessmodellen gebruiken. Er werd een enquête gehouden onder respondenten met een sleutelpositie binnen een AMC met overzicht, ervaring en uitvoerende verantwoordelijkheid voor de bedrijfsvoering. De vierde studie (hoofdstuk 5) onderzocht 1) de hypothese of het huidige incrementalisme in de organisatie en het bestuur van AMC's zou kunnen worden verminderd door radicale veranderingen en 2) in welke context radicale veranderingen mogelijk zouden zijn. Hiertoe werden ongestructureerde interviews gehouden met een aantal toonaangevende stakeholders, waaronder een aantal bestuursvoorzitters van AMC's en zorgverzekeraars, een voormalig Minister, een strategisch adviseur en de directeur van een koepelorganisatie.

Belangrijkste bevindingen

De scoping review bracht op metaniveau overeenkomsten tussen Europese AMC's aan het licht. De meeste landen hebben afzonderlijke bestuursorganen en juridische entiteiten voor de medische faculteit en het ziekenhuis, hebben een decaan die een rol speelt in de organisatie van zowel de medische faculteit als het ziekenhuis, en geven de voorkeur aan een functioneel geïntegreerde relatie tussen de medische faculteit en het ziekenhuis. De organisatie van AMC's in de onderzochte landen lijkt echter te verschillen als het gaat om de reden waarom voor een bepaalde organisatiestructuur wordt gekozen. Verschillende factoren beïnvloeden de keuze voor een bepaalde

organisatorische en juridische structuur, waaronder interne en externe omstandigheden, uitdagingen en doelstellingen. Er kon echter niet één enkel model voor de organisatie van AMC's geïdentificeerd worden (afgezien van de eerder genoemde overeenkomsten op metaniveau) (Hoofdstuk 2).

Na de tweede studie kon geconcludeerd worden dat, hoewel de basis-organisatie van AMC's overeenkomsten vertoont, er een aanzienlijke variatie is in de manier waarop de drie kerntaken worden vormgegeven. De link tussen (complexe) patiëntenzorg, onderzoek en onderwijs in AMC's is in een aantal Europese landen in mindere mate aanwezig. Er is geen gemeenschappelijke definitie voor een AMC, maar meestal zijn de drie kernfuncties patiëntenzorg, onderzoek en opleiding (in meer of mindere mate) gekoppeld. Een belangrijk verschil is de mate van formele integratie tussen het ziekenhuis en de medische faculteit. Deze kan volledig zijn, zoals in Nederland, maar is meestal meer horizontaal, met een sterke positie voor de universiteit. De drempel om als een AMC te worden aangemerkt varieert van land tot land, waarbij Spanje een land lijkt te zijn met een lagere drempel. De relatie tussen ziekenhuizen en universiteiten varieert, maar bijna al deze instellingen zijn eigendom van de overheid of een not-for profit organisatie. Vooraanstaande experts van het Health Systems and Policy Monitor (HSPM) netwerk van de European Observatory on Health Systems and Policies concludeerden in de studie dat de uitdagingen voor de organisatie en het bestuur van Europese AMC's grotendeels dezelfde zijn. De meest genoemde uitdagingen waren financiële spanningen tussen de drie kernfuncties, een toekomstbestendige financiële structuur, personeelstekorten, een gebrekkige infrastructuur voor kennisdeling en een beperkt vermogen om tijdig bestuurlijke of organisatorische aanpassingen door te voeren als reactie op veranderende omstandigheden. De deskundigen in deze studie zien verdere functionele integratie als de meest logische weg voorwaarts (hoofdstuk 3).

Na de eerste twee Europese studies richtten de vervolgstudies zich op de Nederlandse situatie. Als uitgangspunt werd één van de bevindingen uit de Europese vergelijking genomen: het beperkte aanpassingsvermogen van AMC's aan veranderende omstandigheden.

Daarom richtte het derde onderzoek zich op het gebruik van businessmodellen in Nederlandse AMC's als een mogelijk middel om het aanpassingsvermogen te verbeteren en verandering in gang te zetten. Uit het onderzoek bleek dat een businessmodel de complexe organisatie van een AMC kan ondersteunen,

maar dat het ontwerp en gebruik van businessmodellen in de dagelijkse praktijk per AMC varieert. Over het algemeen wordt door de ondervraagden meer potentieel toegeschreven aan het gebruik van een businessmodel dan in de dagelijkse praktijk door hen wordt ervaren. Daarnaast wordt een businessmodel erkend als een middel met het potentieel om verandering teweeg te brengen, maar ook hier geldt dat het niet op grote schaal gebruikt wordt in de dagelijkse activiteiten van AMC's (Hoofdstuk 4).

In de vierde studie werd vanuit een ander perspectief gekeken naar factoren die het beperkte aanpassingsvermogen van AMC's aan veranderende omstandigheden zouden kunnen verklaren. Nederlandse AMC's zijn sinds hun oprichting onderwerp van publiek debat over hun unieke positie en effectiviteit. In de afgelopen jaren zijn de AMC's er in ieder geval niet in geslaagd veranderingen door te voeren die het debat tot zwijgen hebben kunnen brengen. In het onderzoek werd daarom het huidige zogenaamde incrementalisme (doormodderen) afgezet tegen radicale verandering. Met de veronderstelling dat radicale verandering een oplossing zou kunnen zijn voor het huidige incrementalisme. Het onderzoek richtte zich tevens op de voorwaarden waaronder een dergelijke (radicale) verandering al dan niet zou kunnen plaatsvinden. Hiervoor werden ongestructureerde interviews gehouden met een aantal toonaangevende belanghebbenden en werden kwesties geïdentificeerd die de organisatie en het bestuur van Nederlandse AMC's negatief beïnvloeden: 1) negatieve onderstromen en onuitgesproken kwesties door belangenverstrengeling, 2) organisatorische complexiteit door relaties met universiteit, academisch ziekenhuis en academische medisch specialisten, 3) gebrek aan voldoende overheidsregie, 4) concurrentie tussen AMC's door perverse systeemprikkels, 5) verschillende belangen, focus en organisatiecultuur, 6) concentratie van zorg (dit leidt niet altijd tot betere kwaliteit en efficiëntie, omdat het leveren van minder complexe zorg van groot belang is voor onderwijs en onderzoek), 7) de (on)haalbaarheid van de publieke en regionale functies van een AMC, 8) de inefficiëntie van het managen van drie kernfuncties binnen dezelfde organisatie, en 9) de marktwerking in het zorgstelsel. Het onderzoek toonde aan dat het nog niet mogelijk is om incrementalisme te doorbreken door radicale verandering. Op dit moment is er geen context waarin er voldoende bereidheid is om radicale verandering op een robuuste manier te bespreken of te verkennen. Er dient een aantal randvoorwaarden te worden geschapen voordat gevoelige discussies over (radicale) verandering kunnen plaatsvinden (Hoofdstuk 5).

Conclusies en implicaties

Er is weinig literatuur over de organisatie van Europese AMC's. Uit de verkennende studie is gebleken dat informatie van nationale websites de bestaande literatuur aanvult en daarmee een vollediger beeld geeft van het bestuur en de organisatie van deze academische ziekenhuizen. De oorsprong en de organisatorische opzet van Europese AMC's variëren, maar op metaniveau zijn de organisaties vergelijkbaar. De meeste landen hebben afzonderlijke bestuursorganen en juridische entiteiten voor de medische faculteit en het ziekenhuis, hebben een decaan die ook een rol speelt in de organisatie van zowel de medische faculteit als het ziekenhuis, en geven de voorkeur aan een functioneel geïntegreerde relatie tussen de medische faculteit en het ziekenhuis. Interessant is dat de eerste studie ook laat zien dat min of meer dezelfde organisatie, juridische structuur en functioneel geïntegreerde relatie tussen universiteiten en ziekenhuizen de voorkeur lijkt te hebben. Er is echter niet één model voor een AMC-organisatie naar voren gekomen uit het onderzoek (afgezien van enkele overeenkomsten op metaniveau). Bijvoorbeeld door een reeks hypotheses te genereren via diepgaande casestudies die zich ook richten op de context van AMC's. Immers, verschillende factoren beïnvloeden de keuze voor een organisatie en juridische structuur, waaronder interne en externe omstandigheden, uitdagingen en doelstellingen.

In de Europese vergelijking kwam naar voren dat er geen gestandaardiseerde definitie voor een AMC bestaat. Verder werd duidelijk dat er aanzienlijke verschillen zijn in de manier waarop medische faculteiten en universiteiten hun relaties in een AMC organiseren. Men is het er echter over eens dat verdere functionele integratie de logische weg voorwaarts is. Bovendien worden verschillende uitdagingen gedeeld. Zoals het beperkte vermogen om te reageren op verandering, de financiële conflicten tussen de drie kernfuncties, de financiële duurzaamheid en personeelstekorten. Om de kennis over de organisatie en het bestuur van deze grote en complexe organisaties te verbreden en te verdiepen, is verder onderzoek gerechtvaardigd. Zowel beleidsmakers als bestuurders van AMC kunnen best practices gebruiken om van elkaar te leren. Meer dan 100 jaar geleden moedigde Flexner AMC's aan om te leren door “rond te lopen”: "ambulando discimus". Vandaag is de behoefte om van elkaar te leren nog even relevant als altijd. De oprichting van een Europese infrastructuur voor kennisuitwisseling over bestuur en organisatie zou in dit opzicht nuttig kunnen zijn.

Uit onze eerste twee Europese studies bleek dat een van de grootste uitdagingen voor AMC's hun beperkte vermogen is om zich aan te passen aan veranderende omstandigheden. De complexiteit van AMC's draagt bij aan deze problematiek. In een casestudy van Nederlandse AMC's werd onderzocht of het gebruik van een businessmodel het aanpassingsvermogen aan veranderende omstandigheden kan vergroten. Uit het onderzoek kwam naar voren dat het gebruik van businessmodellen niet uniform is bij alle AMC's. Daarentegen is er wel een gemeenschappelijke erkenning van het potentieel van businessmodellen om verandering teweeg te brengen of te ondersteunen. Tevens wordt de observatie gedeeld dat dit zelden gebeurt in de dagelijkse praktijk. Het is daarom aannemelijk dat er verbeteringen mogelijk zijn om het veranderingspotentieel van businessmodellen in AMC's te optimaliseren. Om een innovatief businessmodel succesvol te implementeren, moet rekening worden gehouden met de interpretatie van het concept van een businessmodel en het creëren van een raamwerk van randvoorwaarden. Zorgaanbieders, beleidsmakers of onderzoekers kunnen expliciet de omgeving identificeren waarin het model zal functioneren. In het bijzonder door het identificeren van de mate van veranderingsbereidheid op alle niveaus van de organisatie.

In de laatste studie is onderzocht of het beperkte aanpassingsvermogen van AMC's verklaard kan worden door een incrementalistische aanpak in plaats van een radicalere reactie op veranderende omstandigheden. Uit het onderzoek blijkt dat het in Nederland nog niet mogelijk is om radicale verandering echt te bespreken. Op dit moment is geen sprake van een context waarin voldoende commitment bestaat om echt te gaan praten over mogelijkheden voor radicale verandering. Een aantal randvoorwaarden dient te worden geschapen voordat gevoelige discussies over (radicale) verandering kunnen plaatsvinden. Op basis van het onderzoek kan geconcludeerd worden dat er steun is voor de overheid om het voortouw te nemen in het wegnemen van perverse systeemprikkels om voorwaarden te creëren die wederzijds vertrouwen en gemeenschappelijke belangen bevorderen tussen AMC's onderling en tussen AMC's en andere ziekenhuizen. Dit moet leiden tot een omgeving waarin bestuurders van AMCs met elkaar in gesprek kunnen gaan om mogelijkheden voor verandering te verkennen. Een omgeving waarin zij zich op hun gemak voelen om het gemeenschappelijk belang boven het belang van hun eigen organisatie te stellen.

Ik spreek de hoop uit dat dit proefschrift belanghebbenden uit alle delen van de gezondheidszorgketen zal inspireren om oude overtuigingen, houdingen en percepties los te laten en samen te werken aan een duurzaam gezondheidszorgsysteem. Dit zal het gemakkelijker maken om samen een omgeving te creëren waarin gevoelige verkenningen en gesprekken over verandering kunnen plaatsvinden.

Dit proefschrift is slechts een eerste verkenning van de organisatie en het bestuur van AMC's. Het is de moeite waard om verder te onderzoeken of een meer stapsgewijze of een meer radicale aanpak het meest gunstig zou zijn om veranderingen in de gezondheidszorg teweeg te brengen. Daarnaast is het aanbevelenswaardig om meer bewijs te verzamelen over de inzet van businesssmodellen om verandering te stimuleren. Misschien kan dit worden onderzocht in een Europese context, die tegelijkertijd de aanzet kan geven tot de versterking van een Europese infrastructuur voor het delen van kennis over het bestuur en de organisatie van AMC's.

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DATA MANAGEMENT

The results presented in this paper are based on four studies. None of these studies involved research on humans. The first study was a review of the literature. The second study was an international comparison using a questionnaire with participants who are experts in the organisation and governance of academic medical centres. The third study was again a questionnaire, this time among business managers with knowledge and experience of business models in academic medical centres. Finally, the fourth study consisted of in-depth interviews with stakeholders involved in the organisation and management of academic medical centres, in particular in collaborative relationships.

The results of the scoping review in Chapter 2 are drawn exclusively from the sources cited in the article. For the international comparison in Chapter 3, the questionnaires were administered online or in an editable MS Word file. The data from the questionnaires were uploaded into an MS Excel file. In chapter 4 on business models, a Limesurvey questionnaire was admnistered (online), licensed under Radboudumc. A senior researcher from the IQ Healthcare Department (Scientific Center for Quality of Healthcare) at the Radboud University Medical Centre in Nijmegen performed statistical analyses using IBM SPSS Statistics for Windows, also licensed under the Radboudumc. Finally, the transcripts of the in-depth interviews from the fifth chapter were stored and analysed in ATLAS t.i., also under licence from the Radboudumc. The privacy of the participants in this study is guaranteed by the use of encrypted and unique individual subject codes. All data will be stored anonymously.

The data of the projects in this dissertation are stored in a folder on the department server of the IQ Healthcare Department, Radboudumc. The data are only accessible by the research management and will be saved for 15 years. The datasets analysed during these studies are available from the corresponding author on reasonable request. Requests can be made via iqh@radboudumc.nl

PhD portfolio of Ester Cardinaal

Department: **IQ Healthcare**
PhD period: **01-01-2020 – 01-01-2024**
PhD Supervisor(s): **Prof. dr. H.J.J.M. Berden**
PhD Co-supervisor(s): **Prof. dr. P.P.T. Jeurissen**

Training activities	Hours
Courses	
- How to improve my academic writing (2021)	2.80
- Radboudumc - Scientific integrity (2021)	20.00
- Scientific Integrity for PhD candidates (2021)	28.00
- Qualitative Research Methods and Analysis (2021)	84.00
- RIHS - Introduction course for PhD candidates (2021)	15.00
Seminars	
- Research Integrity Round, The Dark Side of Science (2021)	2.30
- Research Integrity Round, The challenges of collaboration with profit and non-profit organisations (2021)	2.30
- Research Integrity Round, Research Integrity in times of crisis (2022)	2.30
Conferences	
- Oral presentation Research Week, Lectures (2021)	23.80
- Poster presentation European Conference on Health Management, Lisbon (2021)	8.00
- European Public Health Conference (2021)	8.00
Other	
- Peer review for Health Policy (2023)	4.00
Teaching activities	
Lecturing	
- Meet the PhD Cohort A (2023)	44.00
- Meet the PhD Cohort C (2023)	40.00
Supervision of internships / other	
- Begeleiding Msc vierdejaars student 3 maanden onderzoeksstage (2020)	280.00
- Begeleiding Bsc vijfdejaars student 3 maanden onderzoeksstage (2020)	280.00
- Begeleiding Msc zesdejaars student 3 maanden onderzoeksstage (2021)	560.00
- Begeleiding drie MSc studenten Managementwetenschappen (2022)	26.00
- GIOS als expert (2022)	10.00
- GIOS als expert (2023)	10.00
Total	**1,450.50**

CURRICULUM VITAE

Ester Cardinaal was born in 1965 in Utrecht. Although she knew early on that she wanted to study law, circumstances forced her to study secretarial studies first, after which she found her first job as a secretary in a notary's office. However, her desire to study law remained as strong as ever. In 1987 she started as a working student at the University of Utrecht, where she successfully completed her studies in private and criminal law in 1992. Since 1986, Ester has held various jobs, always in a managerial position: Head of the Secretariat Forest and Wood Foundation, Wageningen (1986-1991), Executive Secretary Esselte Meto BV, Nieuwegein (1992-1996), Senior training consultant Bestuursacademie Oost-Nederland, Velp (1996-2000), Head Legal Affairs Anova Zorgverzekeringen, Amersfoort (2000-2001), Head Legal Affairs Agis Zorgverzekeringen, Utrecht (2001-2006), Director Organisation and Development Fluvius, Arnhem (2006-2008), Manager Nijmegen Expert Centre Chronic Fatigue Radboudumc, Nijmegen (2011-2015), Managing Director Rehabilitation Radboudumc, Nijmegen (2015-2019), Managing Director Operating Rooms, Anaesthesiology Radboudumc, Nijmegen(2019-2023), Board Member Court of Appeal, 's-Hertogenbosch (2023-present). Besides her work, Ester has held various ancillary positions to assist organisations with a social impact and further develop herself in board member and supervisory functions. Throughout her career, Ester has attended numerous training courses to develop herself in different areas.

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