Rosa Naomi Minderhout

A novel approach towards acute care integration

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The ‘’acute care supermarket’’?

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ISBN: 978-94-6458-340-3
Cover: Tjitske Oosterholt
Lay-out: Sam Reith | persoonlijkproefschrift.nl
Print: Ridderprint | www.ridderprint.nl

Financial support for the printing of this thesis was kindly provided by the SBOH (employer GP trainees in the Netherlands) and GeriCall.

SBOH
voor artsen in opleiding

A novel approach towards acute care integration

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Proefschrift

ter verkrijging van

de graad van doctor aan de Universiteit Leiden,

op gezag van rector magnificus prof. dr. ir. H. Bijl,

volgens besluit van het college voor promoties

te verdedigen op woensdag 9 november 2022

klokke 13.45 uur

door

Rosa Naomi Minderhout

Geboren te Den Haag
in 1993

Promotiecommissie

Promotor:	Prof. dr. M. E. Numans
Co-promotoren:	Dr. M. A. Bruijnzeels Dr. H. M. M. Vos
Leden van de promotiecommissie:	Prof. dr. J. Gussekloo Prof. dr. M. Bussemaker Prof. dr. P.J.E. Bindels, Erasmus MC Dr. A.M.J. Elissen, Maastricht University

Paranimfen:	Drs. Thom Bongaerts Dr. Laura van der Velde

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Chapter 1

General introduction

General introduction

Before the start of this PhD trajectory on improving coordination and efficiency of acute care organisation in the Netherlands and the sustainability of future accessibility, I asked a few family members and friends with no medical background a simple question: "If your leg hurts after a fall, where do you go to?". The answers varied widely, from arranging a short term visit to your own General Practitioner (GP), to calling the General Practice Cooperative (GPC) and a direct visit to the Emergency Department (ED), referred to by some as "the first aid for accidents". I started thinking about the acute care network as comparable with a shopping trip to a grocery store, a butcher and a cheese shop, where a customer does not know exactly which groceries can be purchased where. A customer may require multiple trips to be able to complete shopping. However, the customer may also choose to shop more efficiently by going to a supermarket where all products are available. Is an "acute care supermarket" the pathway to increased efficiency? Given my interest in acute care and my recently completed year as intern in the ED, I could not wait to get started researching these issues.

The story of Sam

Sam has been working as an intern in a hospital for many years now and thought acute care was quite well organised in the hospital, until the day she herself became a patient in the hospital. After a long stay in the waiting room of the GPC located close to the hospital ED, the GP on duty saw her. However, following such a long wait while she was in severe pain, she fainted. The GP estimated after thorough triage, to better fit the problem in secondary care and referred Sam to the ED. In the ED, Sam was again made to sit in the waiting room for a long time in great pain, before telling her story all over again to another doctor.

Following her hospital visit, Sam asked herself if this process could be improved, specifically the communication and cooperation between the two acute care organisations.

Developments in acute care in the Netherlands

In the Netherlands, as in many high-income countries, acute care organisations are overstretched and overcrowded. [1-4] The acute care networks involve different organisations, including EDs, GPCs, ambulance services, acute mental health services, and home care and nursing home organisations. Crowding gives rise to major problems in healthcare and is caused by a combination of factors. One factor is the growing influx of medically deteriorating patients mainly due to ageing of the population. Ageing people, and the increasing proportion of community-dwelling patients with chronic conditions, more frequently use acute care and require more secondary care attention and hospital days than younger people. [5-7] As the average age of the general population continues to increase, so too does the burden on the working force that decreases due to the same phenomenon. This causes reduced accessibility and delays in treatment leading to suboptimal quality of care, an increased workload for healthcare professionals, and a higher complication rate. [4, 8, 9] Another factor is the suboptimal use of acute care, as a relatively high proportion of acute care use goes to patients presenting problems that are considered to fail to meet the criteria for medical symptoms requiring non-deferable care, and thus have low urgency.[8, 9] Furthermore, the large number of acute care organisations involved, increases the fragmentation caused by healthcare providers working independently and with too little communication. This hampers effective cooperation, as the story of Sam shows. [10, 11] Several studies found that fragmentation was associated with increased cost of care, a lower chance of being subjected to clinically best practice care, and higher rates of preventable (re-) hospitalizations. [12, 13] Due to the large number of organisations involved, there are multiple entrance and exit routes for patients in acute care organisations (figure 1). Patients with an acute care request can report to a GPC after-hours. These GPCs are accessible by telephone: GPs supervise nurses who perform telephone triage for estimation of urgency. The decision of whether patients receive a telephone advice, an in practice consultation, or a home visit is part of the triage. For requests considered urgent, patients can self-refer directly to the ED at all hours, or be transported to the ED by ambulance following a GP visit or as a result of calling the national emergency telephone number, 112. [14] After receiving assistance at an ED, a patient can be hospitalized, referred to a nursing home, referred to an acute mental health service, receive care at home if necessary, or be referred back home without home-care. [15] Effective communication and coordination between all stakeholders at different levels of an organizational structure is crucial to providing high quality acute care. [16, 17]

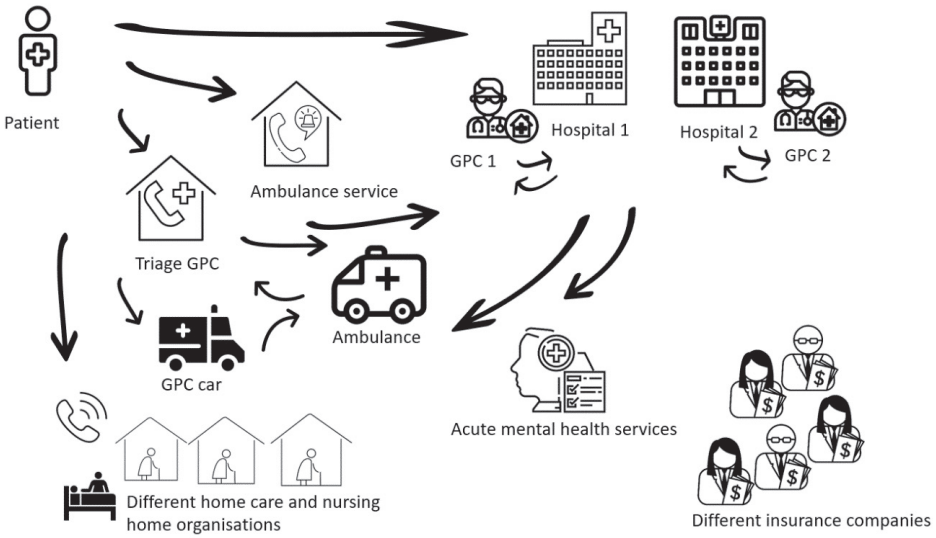

Figure 1. An example of multiple entrance and exit routes for patients in acute care organisations in a city in the Netherlands. How many organisations are involved is region specific.

Acute care integration

In order to improve the coordination and efficiency of acute care organisations in the Netherlands and to maintain accessibility in the future, promoting the multilevel integration of care professionals and organisations is critical. [18] Coordination and integration of acute care organisations are presumed to be the key to successfully overcoming the practical, organisational, and medical challenges. [19] There are several approaches that focus on the integration of care services, one of the approaches that uses a multi-stakeholder perspective and focuses on more than just clinical or organizational outcomes is the Triple Aim approach. Triple Aim defines improvement of a healthcare system as the simultaneous pursuit of three linked aims: improving the individual experience of care, improving the health of populations, and reducing healthcare cost growth.[20, 21] The experience of care professionals also plays an important role and addressing the needs of this group adds a fourth policy aspect, referred to as 'Quadruple Aim'. [22] To achieve the Triple Aim, Population Health Management (PHM) is one strategy for healthcare providers and payers to guide systems change. PHM refers to the large-scale transformation efforts required for the reorganisation and integration of different services at all integration levels from public health, healthcare, social care, and wider public services in order to improve outcomes, summarized in what is called the Triple Aim. [22] To visualize integration of services, the Rainbow Model of Integrated Care (RMIC) by Valentijn et al. was developed as a conceptual framework from six interrelated dimensions: clinical, professional, organisational, systems, functional, and

normative integration (figure 2). [16] These dimensions of integration play complementary roles on the micro- (clinical integration), meso- (professional- and organisational integration), and macro-levels (system integration). At the micro level, where the patient meets the professional, all professionals (such as ambulance nurses, GPs, and telephone assistants) cooperate to provide the best care for the individual. At the meso level, professionals and organisations need to align processes, services, and interests to facilitate the micro level. The professionals need to collaborate intensively to accomplish this alignment through, among others, multidisciplinary training, structural evaluation during meetings with representatives of the various organisations, and sharing of facilities. Organisations have a collective responsibility to ensure the health and well-being of a population by taking shared responsibility for the integration of organisations. Finally, at the macro level, which includes national (financial) incentives and regulations, the government and other funders of the healthcare system, such as health insurance companies, should stimulate system integration. To achieve connectivity and to add overall value, functional and normative integration should ensure the linking of the micro-, meso-, and macro-levels with the system. Functional integration includes planning, human resource-, information- and financial-management. Normative integration includes a shared mission, vision and culture between different individuals, organisations and regulatory bodies. [16] The dimension of normative integration can be further explored using the ''Five lenses on cooperation" model by J. Bell *et al*. [24] This model offers a comprehensive view of methods used to manage cooperation successfully, based on the premise that the best cooperation requires an integral approach with five balanced building blocks: shared ambition, mutual gains, relationship dynamics, organisational dynamics, and process management.

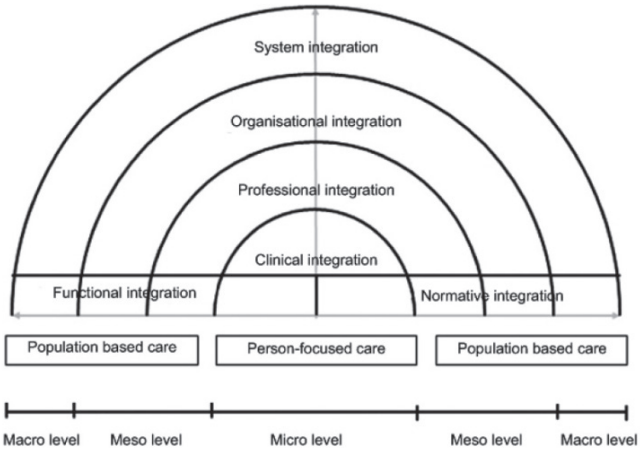

Figure 2. Rainbow model for integrated care (RMIC)

Objective and outline of this thesis

Keeping the story of Sam in mind where communication and coordination between two acute care organisations was insufficient, and the idea of an "acute care supermarket" as a path to increased efficiency, the main objective of this thesis is to gain insight into, and find clues how acute care in the Netherlands can be improved at all integration levels, to be able to maintain sustainable accessibility of acute care for all citizens in the future.

Acute care organisations have a collective responsibility to ensure the health and well-being of a population by taking shared responsibility for the integration of organisations. Every healthcare professional, from doctors, nurses, emergency call-handlers, directors, health insurers, government policy makers, to their countless colleagues must pursue this responsibility. An acute care user also has a certain responsibility to ensure the health and well-being of a population as a citizen. Before further investigating these micro-, meso-, and macro-levels of integration (RMIC), acute care initiatives must be evaluated in a consistent manner. **Chapter 2** of this thesis provides a methodological framework, based on the Triple Aim approach, specifically designed to evaluate various intervention initiatives in acute care in the Netherlands**.** As available data on the selection and implementation of purposeful measures generally lacks clarity, we hope such a framework can help fill this gap for acute care organisations. Diverse acute care initiatives can be evaluated within this framework in a consistent manner, which should lead to improvements in our understanding of current problems faced during the provision of acute care. Using the findings of chapter 2, we evaluated an acute care pilot project with the methodological framework in **Chapter 3.** Here we present the results of the evaluation of implementing a digital merger between a GPC and an ambulance

service in a region in the Netherlands to improve functional integration of healthcare use, healthcare costs, and the experiences of patients and care professionals. At the micro level, the acute care user must not be forgotten. Where chapter 3 discusses patient satisfaction with acute care, **Chapter 4** provides insight into the motives for hospital self-referral during office hours and the barriers deterring GP consultation with a primary care request. In this chapter, we additionally explore solutions to keep these patients in primary care. To discover facilitators and barriers for cooperation between acute care organisations at all integration levels, **Chapter 5** provides a mixed-methods study during the COVID-19 crisis in an urban acute care network in the Netherlands. In order to maintain accessibility of acute care for all citizens in the future, we believe that we have to look into the entire system. A more profound vision is needed towards the way the current healthcare system is organised, incentivised, and how people are directed through the system. Therefore, **Chapter 6** gives a description to further create collaboration among involved organisations.

References

1. Moskop JC, Sklar DP, Geiderman JM, Schears RM, Bookman KJ. Emergency department crowding, part 1--concept, causes, and moral consequences. Ann Emerg Med. 2009;53(5):605-11.
2. Pines JM, Hilton JA, Weber EJ, Alkemade AJ, Al Shabanah H, Anderson PD, et al. International perspectives on emergency department crowding. Acad Emerg Med. 2011;18(12):1358-70.
3. Chan SS, Cheung NK, Graham CA, Rainer TH. Strategies and solutions to alleviate access block and overcrowding in emergency departments. Hong Kong Med J. 2015;21(4):345-52.
4. Bittencourt RJ, Stevanato AM, Bragança C, Gottems LBD, O'Dwyer G. Interventions in overcrowding of emergency departments: an overview of systematic reviews. Rev Saude Publica. 2020;54:66.
5. Wass A, Zoltie N. Changing patterns in accident and emergency attenders. Emergency Medicine Journal. 1996;13(4):269-71.
6. George G, Jell C, Todd B. Effect of population ageing on emergency department speed and efficiency: a historical perspective from a district general hospital in the UK. Emergency Medicine Journal. 2006;23(5):379-83.
7. Sanders AB. Care of the elderly in emergency departments: conclusions and recommendations. Annals of emergency medicine. 1992;21(7):830-4.
8. Giesen P, Franssen E, Mokkink H, van den Bosch W, van Vugt A, Grol R. Patients either contacting a general practice cooperative or accident and emergency department out of hours: a comparison. Emergency medicine journal : EMJ. 2006;23(9):731-4.
9. Smits M, Franscissen O, Weerts M, Janssen K, van Grunsven P, Giesen P. Spoedritten ambulance vaak eerstelijnszorg. Ned Tijdsch Geneesk. 2014;158:A7863.
10. Stange KC. The problem of fragmentation and the need for integrative solutions. Ann Fam Med. 2009;7(2):100-3.
11. Gemeente Den Haag, Dienst Burgerzaken. Den Haag in Cijfers. Available at URL: https://denhaagincijfersnl. 2020.
12. Frandsen BR, Joynt KE, Rebitzer JB, Jha AK. Care fragmentation, quality, and costs among chronically ill patients. Am J Manag Care. 2015;21(5):355-62.
13. Taymour RK, Abir M, Chamberlin M, Dunne RB, Lowell M, Wahl K, et al. Policy, Practice, and Research Agenda for Emergency Medical Services Oversight: A Systematic Review and Environmental Scan. Prehospital and disaster medicine. 2018;33(1):89-97.
14. van der Wulp I, van Baar ME, Schrijvers AJ. Reliability and validity of the Manchester Triage System in a general emergency department patient population in the Netherlands: results of a simulation study. Emerg Med J. 2008;25(7):431-4.
15. DutchHealthcareAuthority. Market scan acute care [in Dutch: Marktscan acute zorg 2017]. https://pucoverheidnl/nza/doc/PUC_3650_22/1/. 2017.
16. Valentijn PP, Boesveld IC, van der Klauw DM, Ruwaard D, Struijs JN, Molema JJ, et al. Towards a taxonomy for integrated care: a mixed-methods study. Int J Integr Care. 2015;15:e003.
17. DutchHealthcareAuthority. Monitor acute care 2018 [in Dutch: Monitor acute zorg 2018]. Available at URL: https://pucoverheidnl/nza/doc/PUC_260889_22/1/ 2018. 2018.
18. Zorgautoriteit N. Monitor acute zorg 2018. 2018.
19. Power N. Extreme teams: Toward a greater understanding of multiagency teamwork during major emergencies and disasters. American Psychologist. 2018;73(4):478-90.

20. Stiefel M, Nolan K. A guide to measuring the triple aim: population health, experience of care, and per capita cost. IHI Innovation Series white paper Cambridge, Massachusetts: Institute for Healthcare Improvement. 2012.
21. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health affairs (Project Hope). 2008;27(3):759-69.
22. Bachynsky N. Implications for policy: The Triple Aim, Quadruple Aim, and interprofessional collaboration. Nurs Forum. 2020;55(1):54-64.
23. Steenkamer B, Drewes H, Putters K, van Oers H, Baan C. Reorganizing and integrating public health, health care, social care and wider public services: A theory-based framework for collaborative adaptive health networks to achieve the triple aim. Journal of health services research & policy. 2020;25(3):187-201.
24. Bell J KE, Opheij W. . Bridging disciplines in alliances and networks: in search for solutions for the managerial relevance gap. International Journal of Strategic Business Alliances. 2013;3(1):50-68.

Chapter 2

A methodological framework for evaluating transitions in acute care services in the Netherlands to achieve Triple Aim

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Mattijs E. Numans
Marc A. Bruijnzeels

Provisionally accepted, BMC Health Service Research

Abstract

Objective The accessibility of acute care services is currently under pressure, and one way to improve services is better integration. Adequate methodology will be required to provide for a clear and accessible evaluation of the various intervention initiatives. The aim of this paper is to develop and propose a Population Health Management(PHM) methodology framework for evaluation of transitions in acute care services.

Results Our methodological framework is developed from several concepts found in literature, including Triple Aim, integrated care and PHM, and includes continuous monitoring of results at both project and population levels. It is based on a broad view of health rather than focusing on a specific illness and facilitates the evaluation of various intervention initiatives in acute care services in the Netherlands and distinctly explains every step of the evaluation process and can be applied to a heterogeneous group of patients.

Introduction

Acute care services are currently overstretched due to a growing demand and influx of patients. [1-3] In the Dutch setting, acute care services involves many different organisations, including Emergency Departments (EDs), General Practice Cooperatives (GPCs), ambulance services, acute mental health services, and home care and nursing home organisations. [4] Overcrowding is caused by a combination of factors such as the growing influx of patients due to the ageing population combined with a shortage of healthcare personnel [1-3], the suboptimal use of acute care services as a high proportion of acute care service use is by patients with low-urgency problems [5-7], and the fragmentation of acute care services with an absence of system-wide coordination and planning.[8] There is a lot of attention for this alarming situation. Care coordination has been identified by the Institute of Medicine as one of the key strategies for the improvement of healthcare systems.[9] Acute care services need to collaborate and coordinate in order to improve care. Unfortunately, a general framework to assess the impact of interventions is lacking which makes comparability of the results difficult. In this paper we develop and propose a methodological framework to assess the impact of solutions to increase the efficacy of acute care services.

There are several frameworks that focus on the integration of care services, but these do not exclusively emphasise acute care services. The more comprehensive international population health value perspective has been summarised in the Triple Aim. Triple Aim defines improvement of a healthcare system as the simultaneous pursuit of three linked aims: improving the individual experience of care, improving the health of populations, and reducing healthcare cost growth.[10, 11] The experience of care professionals also plays an important role, and addressing the needs of this group adds a fourth policy aspect, which increasingly often leads towards the 'Quadruple Aim' to be reached in healthcare reform initiatives. [12] To achieve the Triple Aim, Population Health Management (PHM) is a strategy for healthcare providers and payers to guide systems change. [13]

Based on the Triple Aim approach, we present a new methodological framework specifically designed to evaluate acute care initiatives. Diverse initiatives can be evaluated within this framework in a consistent manner, which should lead to improvements in our understanding of current problems faced during the provision of acute care services. The researchers have already used this framework for the evaluation about the value of merging medical data from ambulance services and GPCs in a region in the Netherlands. [14]

Main text

Methods: Several concepts

Triple Aim and Learning System

The Triple Aim infrastructure (figure 1) [11] focuses on a number of governance aspects on two levels: at the more strategic population level and the operational project level. At the population level, the infrastructure focuses on population aims such as quality of care, population health and per capita cost. A common purpose regarding a specific population that encourages the collaboration and compliance amongst all acute services stakeholders is very important. [10] At the project level, organisations need to collaborate with a focus on the project goals through a portfolio of projects and investments, each project and investment contributes partly to the population goals. Different types of integrations can be implemented within the same population. The framework encourages improvement through a 'learning system' in which newly acquired knowledge is used to develop and adopt changes that improve performance. [10] To safeguard a learning system, projects include structured evaluation moments to monitor the progress of improvement.

Integrated care

Since integration of services is one of the key elements in the acute care initiatives the second concept concerns integrated care. To achieve a better understanding of integrated care initiatives, the researchers adopted the Rainbow model for integrated care (RMIC).[15] The RMIC is a conceptual framework to improve insight into the six interrelated dimensions of integrated care: clinical, professional, organizational, systems, functional, and normative integration (figure 2). [16, 17] These dimensions play complementary roles on the micro- (clinical), meso- (professional- and organizational) and macrolevels (system). At the micro level, where the patient meets the professional, all professionals cooperate to provide the best care for the individual. At the meso level, professionals and organisations need to align processes, services and interests to facilitate the micro level. Finally, at the macro level the government and funders such as health insurance companies should stimulate system integration. To achieve connectivity between and within the dimensions, functional and normative integration should ensure the linking of the micro, meso and macro levels with the system. Functional integration includes planning, human resource-, information- and financial-management. Normative integration includes a shared mission, vision and culture between different individuals and organisations. [16] In the Triple Aim infrastructure the project level should be linked with the population level through normative and functional integration. To achieve specific Triple Aim population goals,

interventions are needed at all levels of integration and need to be represented in the portfolio of projects and investments in the Triple Aim infrastructure.[15]

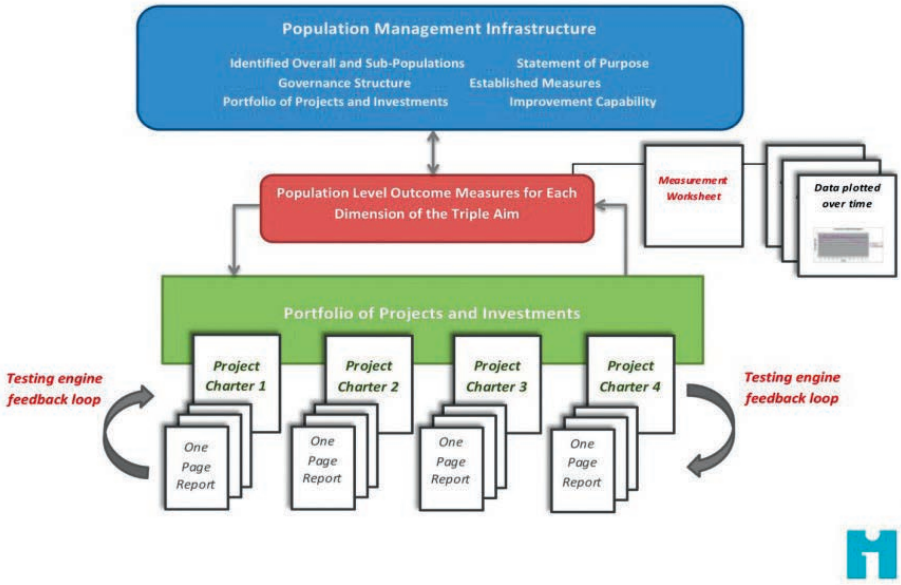

Figure 1: Triple Aim infrastructure by the Institute for Healthcare Improvement

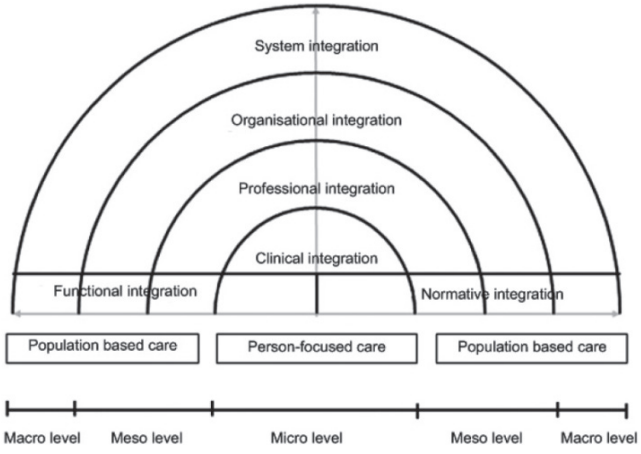

Figure 2: Rainbow model for integrated care (RMIC)

Population Health Management
PHM refers to the large-scale transformation required for the reorganisation and integration of different services at all levels of integration. These efforts cover public health, healthcare, social care and wider public services with the aim of improving outcomes, and are summarized in the Triple Aim. [18] The concept of PHM is still developing but some care principles are: [19]

- Assessment of an adverse event
- Define a specific population with a high risk of adverse outcomes in healthcare or a situation that you like to solve (a burning platform, for example, overcrowding of the EDs)
- Stratify the population according to the risk of the adverse event
- Apply proactive interventions tailored to the needs of the specific risk adjusted subgroups

Results: Methodological tools

Five steps for the evaluation of acute care services came out of merging the principles and key elements of the three concepts and synthesising the commonalities.

Step 1: Identification of the specific population. According to literature, a specific population that will potentially derive maximum benefit from care improvement in acute services are older patients with comorbidities. Older adults often make increased use of acute care and some studies have reported an approximately fivefold higher rate of emergency admissions among patients aged 70 years or above compared to patients aged 30 years or less. [20, 21] This group also experiences higher rates of adverse outcomes such as return to the ED, hospitalisation or death. [22] The typical clinical presentation of illness accompanied by the presence of multiple comorbidities complicates evaluation and contributes to a higher risk of adverse outcomes. [23] Due to comorbidities, the elderly often receive help from multiple healthcare, social care and home care providers and are therefore subject to care fragmentation as a result of poor coordination of services and a lack of communication between care providers.[24]

Step 2: Triple Aim outcomes
2a: Population health outcomes
To evaluate the health outcomes of a population, it is important to establish clear indicators. Indicators consist of all possible 'care pathways' that a patient with an acute care request may use. The amount of care use gives an impression of health status. Therefore, indicators for population health outcomes in a

framework specific for acute care services include ED visits, hospitalisation, use of the ambulance service, use of the GPC, contact with the GP, psychiatric care, home care or transfer to a nursing home, and death after an acute care request during the follow-up period.

Step 2b: Per capita cost

Within these indicators for population health outcomes, per capita costs of healthcare should be estimated and taken into account. Table 1 provides a framework for measuring per capita cost.

Table 1 Costs made in acute care services

Indicators	
Emergency care visits	Cost incurred during an emergency visit during a follow-up period
Hospitalisation	Costs incurred during hospital stay during follow-up period
GP use	Costs of the number of times that a patient reports with an acute request for help from the GP during a follow-up period
Psychiatric care	Cost of the number of times that a patient reports to the crisis service with an acute request and any hospitalization costs during a follow-up period
Nursing home	Cost of the number of days a patient is admitted to the nursing home after acute care request during a follow-up period
Ambulance service	Cost of the number of times that a patient has been transported with the ambulance after an acute treatment request during a follow-up period
Home care	Cost of the number of hours a patient needed a district nurse after acute treatment request during a follow-up period
Short stay nursing homes	Cost of the number of days a patient is admitted to a first-line stay after acute care request during a follow-up period

Step 2c: Experience of care

Patient Experiences

To assess experiences with acute care services during a project, questionnaires can be completed by the patients receiving care. Examples include Consumer Assessment of Healthcare Providers and Systems (CAHPS) and How's Your Health.[10] The Consumer Quality Index (CQI) questionnaires (CQI Emergency department, CQI ambulance care and CQI GPC) [25, 26], which is based on the CAHPS, is often used in the Netherlands.

Experiences of healthcare professionals

Job satisfaction and wellbeing are of considerable importance as they both help protect healthcare professionals against somatic complaints, psychological distress and burnout.[27] This is especially important in acute services since healthcare workers in this area are more prone to burn-out due to their frontline roles with patients, the large turnover rate of patients, and the lack of a buffer.[28]

The experiences of professionals can be evaluated with questionnaires, an example is the validated Leiden Quality of Work Life Questionnaire.[29]

Step 3: Follow-up period
The continuous monitoring of results at the population level plotted over time provides an impression of longitudinal outcomes. To determine the results of a service we have to first choose a follow-up period. In literature, the length of the follow-up period per case in a specific population varies from 14 days to 12 months, with outcomes at 30 and 90 days being the most commonly reported follow-up periods.[30, 31]

Step 4: a comparable group
In order to demonstrate a difference between regular care and care during pilot projects in acute services, data on a comparable group from your specific population is also needed. When a large project is undertaken there is often no comparison group available. In this case patient data before commencement of the project (baseline measurements) can be used. This allows researchers to examine some outcome of interest prior to an intervention, but it does not eliminate the possibility that results within the intervention group might have occurred regardless of the intervention.[32]

Step 5: a learning system
To ensure a learning system, all projects include some structured evaluation moments that allow monitoring of the progress of improvements. The researcher may release some interim project results during structured evaluations but this should not interfere with possible improvements. Care coordination can be measured using an integration meter such as the the validated RMIC Measurement Tool. [33] The 'Integration monitor Care coordination' (see appendix A), based on this tool, was developed by the researchers to make the tool practically applicable and was applied to acute care projects in the Netherlands but has not been validated yet.

Discussion

A systematic review of literature on the Triple Aim framework concluded that providers generally struggled due to a lack of guidance and an absence of composite sets of measurements that allow performance assessment. [34] As available data generally lacks clarity regarding the selection and implementation of purposeful measures, the researchers hope that this new framework will fill this gap for acute care services. This framework shows the necessity of a mixed-methods approach in which we combine the epidemiologic rigor of a pragmatic cohort study with specific outcomes, follow up period and control situations and a more action research oriented approach of a learning system to assess the improvement of integration of services as a determinant of the Triple Aim outcomes. The three goals must be achieved simultaneously. Organisations have a collective responsibility to ensure the health and well-being of a population by taking shared responsibility for the integration of services. A collective, shared perspective on the evaluation and interpretation of the results makes negotiations easier and allows goals to be pursued in this multi-stakeholder network.[11]

Evaluating similar acute care initiatives in an unambiguous manner in order to compare results and make adjustments where necessary is of considerable added value. Small-scale successes must be promoted so that a common language can be established and successful initiatives can be implemented on a larger scale. To ensure a learning system, projects must include structured evaluation moments that allow monitoring of the progress of improvements, preferably based on routinely registered data. This requires statistics at the regional level that are discussed within the network and are used to encourage adjustments. This method of evaluation differs from a more managerial blueprint implementation in which everything is recorded in advance. This methodological framework permits the evaluation of various acute care initiatives in practice and ensures that initiatives can be evaluated consistently so that the general body of knowledge will improve. The Integration monitor Care coordination is a good example of practical application. Instruments used in evaluation must provide insight into practical issues, validity is certainly important but adjustments are sometimes necessary to make it work in practice. The outcome is a more or less circular process that facilitates the continuous improvement. [15] This new framework helps to share experiences and learnings between projects while still ongoing, thus promoting a learning system. This addresses one of the key challenges today, when having a major reform going on with multiple projects, that they all face similar challenges but need to come up with solutions separately because there is no common framework – and even if there is, like the Innovation fund in Germany [35], project progress is assessed individually and not compared.

Conclusions

The new framework was developed based on literature and was designed to help in the assessment of project outcomes in acute services carried out by different healthcare organisations. We recommend that those involved in setting up a project in an acute care organisation consider applying this framework, since it enhances the comparability of mechanisms and outcomes.

Limitations

The validity of the new framework has yet to be determined in practice. One challenge is maintaining a balance between the components of the Triple Aim. As these components are interdependent, changes pursued in any one goal might influence the remaining goals.[11] Another problem confronting larger projects is that the identification of a comparable group is difficult and may not be available. An additional major issue that must be considered during a project is the considerable effort required to measure the dimensions of the Triple Aim. During projects in the Netherlands it emerged that data collection in acute care services was very demanding in view of the multiple organisations that need to cooperate within the multi-stakeholder network. [14] To improve chances of success, the researchers suggest that a plan for data collection should be carefully thought-out before starting a project, as has been demanded by main authors before (e.g. Pitchforth and Nolte, Tsiachristas et al.). [36, 37] Clearly, as there is a diversity in the acute care settings in the industrialized world, especially in the organizational models for out-of-hours primary care between and within European Union (EU) countries [38], any framework should be adapted to country and region-specific factors.

References

1. Moskop JC, Sklar DP, Geiderman JM, Schears RM, Bookman KJ. Emergency department crowding, part 1--concept, causes, and moral consequences. Ann Emerg Med. 2009;53(5):605-11.
2. Pines JM, Hilton JA, Weber EJ, Alkemade AJ, Al Shabanah H, Anderson PD, et al. International perspectives on emergency department crowding. Acad Emerg Med. 2011;18(12):1358-70.
3. Bittencourt RJ, Stevanato AM, Bragança C, Gottems LBD, O'Dwyer G. Interventions in overcrowding of emergency departments: an overview of systematic reviews. Rev Saude Publica. 2020;54:66.
4. Kroneman M, Boerma W, van den Berg M, Groenewegen P, de Jong J, van Ginneken E. Netherlands: Health System Review. Health Syst Transit. 2016;18(2):1-240.
5. Giesen P, Franssen E, Mokkink H, van den Bosch W, van Vugt A, Grol R. Patients either contacting a general practice cooperative or accident and emergency department out of hours: a comparison. Emergency medicine journal : EMJ. 2006;23(9):731-4.
6. Minderhout RNN, Venema P, Vos HMM, Kant J, Bruijnzeels MA, Numans ME. Understanding people who self-referred in an emergency department with primary care problems during office hours: a qualitative interview study at a Daytime General Practice Cooperative in two hospitals in The Hague, The Netherlands. BMJ open. 2019;9(6):e029853.
7. Smits M, Franscissen O, Weerts M, Janssen K, van Grunsven P, Giesen P. Spoedritten ambulance vaak eerstelijnszorg. Ned Tijdsch Geneesk. 2014;158:A7863.
8. Taymour RK, Abir M, Chamberlin M, Dunne RB, Lowell M, Wahl K, et al. Policy, Practice, and Research Agenda for Emergency Medical Services Oversight: A Systematic Review and Environmental Scan. Prehospital and disaster medicine. 2018;33(1):89-97.
9. McDonald KM, Sundaram V, Bravata DM, Lewis R, Lin N, Kraft SA, et al. Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies (Vol. 7: Care Coordination). Rockville (MD): Agency for Healthcare Research and Quality (US); 2007.
10. Stiefel M, Nolan K. A guide to measuring the triple aim: population health, experience of care, and per capita cost. IHI Innovation Series white paper Cambridge, Massachusetts: Institute for Healthcare Improvement. 2012.
11. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health affairs (Project Hope). 2008;27(3):759-69.
12. Bachynsky N. Implications for policy: The Triple Aim, Quadruple Aim, and interprofessional collaboration. Nurs Forum. 2020;55(1):54-64.
13. Steenkamer B, Drewes H, Putters K, van Oers H, Baan C. Reorganizing and integrating public health, health care, social care and wider public services: a theory-based framework for collaborative adaptive health networks to achieve the triple aim. J Health Serv Res Policy. 2020;25(3):187-201.
14. Minderhout RN, Vos HMM, van Grunsven PM, de la Torre YRI, Alkir-Yurt S, Numans ME, et al. The Value of Merging Medical Data from Ambulance Services and General Practice Cooperatives Using Triple Aim Outcomes. International journal of integrated care. 2021;21(4):4.

15. Valentijn PP, Schepman SM, Opheij W, Bruijnzeels MA. Understanding integrated care: a comprehensive conceptual framework based on the integrative functions of primary care. International journal of integrated care. 2013;13:e010.
16. Valentijn PP, Boesveld IC, van der Klauw DM, Ruwaard D, Struijs JN, Molema JJ, et al. Towards a taxonomy for integrated care: a mixed-methods study. International journal of integrated care. 2015;15:e003.
17. Boesveld IC, Bruijnzeels MA, Hitzert M, Hermus MA, van der Pal-de KM, van Den Akker-van Marle M, et al. Typology of birth centres in the Netherlands using the Rainbow model of integrated care: results of the Dutch Birth Centre Study. BMC health services research. 2017;17(1):1-13.
18. Steenkamer B, Drewes H, Putters K, van Oers H, Baan C. Reorganizing and integrating public health, health care, social care and wider public services: A theory-based framework for collaborative adaptive health networks to achieve the triple aim. Journal of health services research & policy. 2020;25(3):187-201.
19. Steenkamer BM, Drewes HW, Heijink R, Baan CA, Struijs JN. Defining Population Health Management: A Scoping Review of the Literature. Popul Health Manag. 2017;20(1):74-85.
20. George G, Jell C, Todd B. Effect of population ageing on emergency department speed and efficiency: a historical perspective from a district general hospital in the UK. Emergency Medicine Journal. 2006;23(5):379-83.
21. Wass A, Zoltie N. Changing patterns in accident and emergency attenders. Emergency Medicine Journal. 1996;13(4):269-71.
22. Aminzadeh F, Dalziel WB. Older adults in the emergency department: a systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. Annals of emergency medicine. 2002;39(3):238-47.
23. Samaras N, Chevalley T, Samaras D, Gold G. Older patients in the emergency department: a review. Annals of emergency medicine. 2010;56(3):261-9.
24. Deschodt M, Laurent G, Cornelissen L, Yip O, Zuniga F, Denhaerynck K, et al. Core components and impact of nurse-led integrated care models for home-dwelling older people: A systematic review and meta-analysis. International journal of nursing studies. 2020;105:103552.
25. Bos N, Sturms LM, Stellato RK, Schrijvers AJ, van Stel HF. The Consumer Quality Index in an accident and emergency department: internal consistency, validity and discriminative capacity. Health Expect. 2015;18(5):1426-38.
26. Smirnova A, Lombarts K, Arah OA, van der Vleuten CPM. Closing the patient experience chasm: A two-level validation of the Consumer Quality Index Inpatient Hospital Care. Health Expect. 2017;20(5):1041-8.
27. De Jonge J, Schaufeli WB. Job characteristics and employee well-being: A test of Warr's Vitamin Model in health care workers using structural equation modelling. Journal of organizational behavior. 1998:387-407.
28. Ifediora CO. Burnout among after-hours home visit doctors in Australia. BMC family practice. 2016;17(1):2.
29. van der Doef M, Maes S. The Leiden Quality of Work Questionnaire: its construction, factor structure, and psychometric qualities. Psychological reports. 1999;85(3):954-62.
30. Cousins G, Bennett Z, Dillon G, Smith SM, Galvin R. Adverse outcomes in older adults attending emergency department: systematic review and meta-analysis of the Triage Risk Stratification Tool. European journal of emergency medicine : official journal of the European Society for Emergency Medicine. 2013;20(4):230-9.

31. Galvin R, Gilleit Y, Wallace E, Cousins G, Bolmer M, Rainer T, et al. Adverse outcomes in older adults attending emergency departments: a systematic review and meta-analysis of the Identification of Seniors At Risk (ISAR) screening tool. Age and ageing. 2017;46(2):179-86.
32. Salkind NJ. Encyclopedia of research design: Sage; 2010.
33. Valentijn P, Angus L, Boesveld I, Nurjono M, Ruwaard D, Vrijhoef H. Validating the Rainbow Model of Integrated Care Measurement Tool: results from three pilot studies in the Netherlands, Singapore and Australia. International journal of integrated care. 2017;17(3).
34. Obucina M, Harris N, Ja F, Chai A, Radford K, Ross A, et al. The Triple Aim framework in the context of primary healthcare: A systematic literature review. 2018.
35. Berghöfer A, Göckler DG, Sydow J, Auschra C, Wessel L, Gersch M. The German health care Innovation Fund–An incentive for innovations to promote the integration of health care. Journal of Health Organization and Management. 2020.
36. Nolte E, Pitchforth E. What is the evidence on the economic impacts of integrated care? 2014.
37. Kadu M, Ehrenberg N, Stein V, Tsiachristas A. Methodological quality of economic evaluations in integrated care: evidence from a systematic review. International journal of integrated care. 2019;19(3).
38. Steeman L, Uijen M, Plat E, Huibers L, Smits M, Giesen P. Out-of-hours primary care in 26 European countries: an overview of organizational models. Family Practice. 2020;37(6):744-50.

Additional material Chapter 2

Appendix A: Example of an integration meter questionnaire for acute care services

Domain	Determinant	Niv	Description
Clinical integration	Triage	1	Every organization does its own triage with a separate triage system
		2	Every organization does its own triage but with an unambiguous triage system
		3	There is a telephone consultation with high-risk patients between different organizations about the triage
		4	One general triagist for different organizations together
	Deployment of the right healthcare prof.	1	Different organizations are not considered together which healthcare professional can best be used
		2	If a high-risk patient is involved, it is occasionally examined which prof. can best be deployed. Consultation takes place by telephone
		3	There is always a telephone consultation between the various profs if another prof. can be used more effectively
		4	The various profess are present in one room and decide jointly which prof. can best be deployed
	Transfer patient data	1	Profs never receive telephone or written patient data from the other organization
		2	Profs receive patient data only by telephone transfer in case of a referral from another organization
		3	Profs receive patient data both digitally and by telephone transfer in case of a referral from another organization
		4	One ICT system with an electronic file is used for the entire care process
	Case management	1	No coordinated policy, each prof. does this separately
		2	Incidental policy is coordinated by several profs in high-risk patients
		3	High-risk patients are regularly discussed in multidisciplinary consultation where policy is coordinated
		4	All high-risk patients are discussed in multidisciplinary consultation where policy is coordinated
	Outflow coordination	1	No cooperation with the organizations that facilitate outflow
		2	Incidentally collaboration with organizations that facilitates outflow
		3	Organizations are regularly involved in facilitating outflow
		4	Fixed agreements exist with the organizations involved in the outflow of patients. A joint responsibility is felt.

Appendix A: Continued

Domain	Determinant	Niv	Description
Professional integration	Vision of healthcare profs	1	No common vision
		2	A common vision, but it is not shared by everyone
		3	A common vision that is propagated by all organizations
		4	A common vision, also for the long term, where all organizations are held responsible for realizing the vision
	Protocols	1	Every prof uses exclusively his own monodisciplinary protocols
		2	Profs are aware of protocols from other disciplines, but do not use them themselves
		3	Profs use multidisciplinary protocols. When a deviation of it is made, they do not discuss the reasons for this deviation
		4	Profs use multidisciplinary protocols. When a deviation from the protocol is made, account is taken of the reasons for this deviation
	Interprof. Education	1	Every organization arranges its own in-service training
		2	Multidisciplinary training is offered to all organizations, but is not required
		3	Multidisciplinary training is offered to all organizations. Some of them are mandatory (such as dealing with acute situations)
		4	Multidisciplinary training with regard to urgent actions is required to be regularly followed with all organizations, as a fixed component of a common policy
	Interprof. Governance	1	Results of the quality of care provided by profs are never discussed with the other organization
		2	Results of the quality of care provided by profs are discussed occasionally
		3	Results of the quality of care provided by profs are discussed structurally with each other, no further action is taken
		4	Results of the quality of care provided are structurally discussed with each other and evaluated. They are jointly responsible for the entire care process.

Appendix A: Continued

Domain	Determinant	Niv	Description
Organizational integration	Learning organization	1	No evaluation or joint meetings with representatives of the different organizations
		2	Occasional evaluation during meetings with representatives
		3	structural evaluation during meetings with representatives and if necessary an improvement plan is drawn up
		4	Structural evaluation takes place during meetings with representatives and an improvement plan is drawn up if necessary based on the results of evaluations + regularly monitored
	Evaluate the acute care chain	1	Functioning of the acute care chain is never evaluated within the region
		2	Functioning of the acute care chain is occasionally evaluated within the region; no fixed indicators have been drawn up for this
		3	Functioning of the acute care chain is occasionally evaluated within the region on the basis of process and outcome indicators
		4	Functioning of the acute care chain is structurally evaluated within the region on the basis of process and outcome indicators and directs the implementation of the acute care where necessary
	Common objectives	1	No joint objectives have been set by the organizations
		2	Joint objectives have been formulated, but these are not evaluated
		3	Joint objectives have been formulated that are structurally measured and evaluated
		4	A joint objective has been formulated that will be evaluated and monitored on a structural basis. Active action is taken to achieve the objectives
	Complaints regulations	1	Every discipline has its own complaints regulations
		2	In the case of a complaint, the total care process is being looked into
		3	Complaints are picked up and processed jointly
		4	One complaints regulations exists for the total care process
	Service management	1	Professionals have no shared service management with each other
		2	Profs share project facilities jointly (e.g. a joint information leaflet)
		3	Prof. delen structureel gemeenschappelijke faciliteiten en iedere organisatie handhaaft zijn eigen faciliteiten
		4	Profs have shared structural facilities and each organization maintains its own facilities (e.g. there is a joint website, but every discipline also has its own website)

Appendix A: Continued

Domain	Determinant	Niv	Description
Functional integration	Information management	1	information systems of the various profs are not integrated
		2	Information systems of the various profs are partially integrated or accessible to different care providers
		3	information systems of the various profs form one system
		4	Information systems of the various profs form one system and are accessible to the patient
	Feedback with quality indicators	1	Profs within the acute care chain never evaluate each other's performance with the help of quality indicators
		2	Profs within the acute care chain evaluate each other's performance incidentally with the help of joint quality indicators
		3	Profs within the acute care chain inform and discuss each other's performance structurally on the basis of national quality indicators
		4	Profs share common and national quality indicators for the entire care process. These indicators are structurally evaluated and the implementation of the acute care is adjusted where necessary

Appendix A: Continued

Domain	Determinant	Niv	Description
System integration	Environment management	1	Many different organizations in the region, such as general practitioners, ambulance services and district nurse organizations, and this inhibits cooperation
		2	Many different organizations in the region but this does not play a role in the cooperation
		3	Many different organizations in the region and this facilitates good cooperation
		4	The acute service act as one organization (with multiple disciplines)
	Cooperation with health insurers	1	Insurers are not involved in the project
		2	Insurance companies are occasionally involved
		3	Insurers are structurally involved by the organizations and joint interests are discussed
		4	Insurers are part of the various stakeholders involved. There are structural meetings to discuss each other's interests and objectives. The objectives are regularly evaluated and monitored
	Cooperation with the Ministry of Health inspection	1	Inspection is not involved
		2	Inspection is occasionally involved
		3	Inspection is structurally involved by the organizations and joint interests are discussed
		4	Inspection is part of the various stakeholders involved. There are structural meetings to discuss each other's interests and objectives. The objectives are regularly evaluated and monitored
	Cooperation with acute care in the region	1	Acute care network is not involved
		2	Acute care network is occasionally involved
		3	Acute care network is structurally involved by the organizations and joint interests are discussed
		4	Acute care network is part of the various stakeholders involved. There are structural meetings to discuss each other's interests and objectives. The objectives are regularly evaluated and monitored
	Cooperation with patient associations and client council	1	Patient associations or client councils are not involved
		2	Patient associations or client councils are occasionally involved
		3	Patient associations or client councils are structurally involved by the organizations and joint interests are discussed
		4	Patient associations or client councils are part of the various stakeholders involved. There are structural meetings to discuss each other's interests and objectives. The objectives are regularly evaluated and monitored

Appendix A: Continued

Domain	Determinant	Niv	Description
Normative integration	Trust	1	No trust between the various chain partners
		2	Little confidence in chain partners
		3	Trust between the chain partners; they know each other well and can trust everyone
		4	Trust between the chain partners; attention is paid to maintaining trust by making it regularly negotiable
	Visionary leadership	1	No profs within the various organizations with a vision about cooperation
		2	A few profs within the various organizations with a vision about cooperation
		3	Profs within the various organizations with a vision about cooperation that inspires and enthuses cooperation
		4	Profs with a vision about cooperation that inspires and thus motivates and encourages collaboration and action. As a result, the different organizations become more and more a whole
	Informal cooperation	1	Every organization has its own culture and the informal contacts remain within their own organization
		2	Every organization knows its own culture and conscious activities are regularly developed to get to know each other
		3	There are good mutual informal relationships, but cultural differences are still noticeable
		4	There is a culture which the mutual informal relationships between all organizations are excellent

Chapter 3

The value of merging medical data from ambulance services and general practice cooperatives using Triple Aim outcomes

A pilot project in Gelderland-South, the Netherlands

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International Journal of Integrated Care – 2021 Oct
DOI: http://doi.org/10.5334/ijic.5711

Abstract

Background Acute care services are currently overstretched in many high income countries. Overcrowding also plays a major role in acute care in the Netherlands. In a region of the Netherlands, the general practice cooperative (GPC) and ambulance service have begun to integrate their care, and the rapid and complete transfer of information between these two care organisations is now the basis for delivering appropriate care. The primary aim of this mixed-methods study is to evaluate the Netherlands Triage System (NTS) merger project and answering the question: What is the added value of implementing a digital NTS merger in terms of healthcare use and healthcare costs? A secondary question is: What are the experiences of patients and care professionals in different acute healthcare organisations following implementation of the digital NTS merger?

Methods Patients who made an acute care request during the 12 months before the NTS merge intervention (control period) were compared with matched patients in the 12 months following the start of the NTS merge. Outcomes included difference in healthcare use 30 days after an acute event and patient' and care professional' experiences during the intervention period. To assess healthcare costs, we used reference prices updated to 2021.

Results Compared to patients in the control period, the number of nursing home admissions was lower and fewer Emergency Department (ED) costs were incurred compared to the control period in the 30 days following the acute care request. However, the opposite trend was seen for the GPC. Furthermore, patients in the intervention period were very satisfied overall with the acute care network (4.63 of 5) and care professionals were fairly satisfied with the cooperation to date (2.73 of 4).

Conclusion The Triple Aim for acute care can be met using relatively simple interventions, but medical data merging is a prerequisite for achieving more robust results covering on the various aspects of the Triple Aim. These successes should be communicated so that a common language can be developed that will support the successful further implementation of larger scale initiatives.

Background

Acute care services are currently overstretched in many high income countries, due to a growing demand of patients. [1-3] This leads to negative consequences, including temporary limitations to accessibility, a reduced quality of care, and an increased workload for care professionals, that might be avoided. [1-6]

Overcrowding also plays a major role in acute care in the Netherlands, as illustrated by the 14.7% increase in ambulance deployments between 2013 and 2016. [7] Acute care services across the Netherlands involve many different organisations, including Emergency Departments (EDs), General Practice Cooperatives (GPCs) and ambulance services. The General Practitioner (GP) acts as a gatekeeper at the primary care level, deciding whether to refer a patient to secondary healthcare, resulting in lower healthcare costs for the society as a whole. [8] With a referral from their GP, patients are able to utilize secondary healthcare and are eligible for reimbursement.[9] Patients with medical problems typically visit their own GP during office hours, even when problems are perceived as urgent or threatening. [10] After-hours patients with an acute care request can report to an GPC. In case of a request considered urgent, they can self-refer directly to the ED at all hours, or be transported to the ED by ambulance following a GP visit or as a result of calling the national emergency telephone number 112. [11] After receiving assistance at an ED, a patient can be hospitalised, referred to a nursing home, receive care at home if necessary, or be referred back home without home-care. [12] These multiple entrance and exit routes increase the pressure on all acute care services [13, 14] and the large number of acute care services leads to fragmentation of care. Fragmentation seems associated with increased costs of care, a lower chance of being subjected to clinical best practice care, and higher rates of preventable (re-) hospitalizations. [15] In order to improve the coordination and efficiency of acute care services in the Netherlands and to maintain accessibility in the future, promoting the multilevel integration of care professionals and organisations is critical. [16]

In the region of Nijmegen, a city in the South-East of the Netherlands with a population of around 170.000 people, the GPC Nijmegen and ambulance service Gelderland-South started to integrate their care through a rapid and complete transfer of information between these two care organisations. [17] Previously, the telephone was used by the GPC to convey patient information to the ambulance service, resulting in unnecessary delays and loss of information. In 2012 both services installed the validated Netherlands Triage System (NTS).[18] This sophisticated software is now used by emergency call handlers at both services to prioritise care requests by urgency, and in cases of high urgency, patients who call the GPC can be referred directly to the ambulance service. A digital

NTS merger took place in the region in October 2017 and today the appropriate transfer of patient information and cooperation of the organisations are important in supporting referral. Now when a patient with an acute care need calls the GPC Nijmegen and the triage outcome indicates that an ambulance is required, the so-called 'digital NTS merger' ensures that a digital report of findings and previous history is sent to the ambulance service Gelderland-South via a secure e-mail service.

This study focused on the evaluation of the digital NTS merger that was introduced in the autumn of 2017 in Gelderland-South. There are several general conceptual evaluation frameworks that focus on the integration of care services, but these do not exclusively emphasise acute care services. The Triple Aim approach, first described by Berwick, Nolan, and Whittington in 2008, uses a multi-stakeholder perspective and focuses on more than just clinical or organizational outcomes. [19] Triple Aim defines improvement of a healthcare system as the simultaneous pursuit of three linked aims: improving the individual experience of care, improving the health of populations, and reducing the per capita cost of healthcare.[19, 20] Based on the Triple Aim approach, a framework for evaluation of transitions in acute care services was developed by us, which we used for the current evaluation. [21] The framework we made, is based on a broad view of health rather than focusing on a specific illness. It distinctly explains every step of the evaluation process and can be applied to a heterogeneous group of patients. Our hypothesis was that the digital NTS merger may have yielded ''Triple Aim'' outcomes, for this context translated to better acute care experiences for patients, reduced unnecessary healthcare use and costs, and the mutual cooperation of and a better work experience for the individual care professionals involved.

The aim of this mixed-methods study is to answer two questions: (1) What is the added value of implementing a digital NTS merger in terms of healthcare use and healthcare costs? (2) What are the experiences of patients and care professionals in different acute healthcare organisations after implementation of the digital NTS merger?

Methods

A commonly accepted point of departure of the Triple Aim approach is to begin with defining a specific population with a high risk of adverse outcomes in healthcare, or a situation needing resolution (a so called ''burning platform'' in healthcare). [22] We operationalized this by including the most vulnerable in the study, selected by identifying those with potentially the highest risk of adverse outcomes, [20] that are related to poor information exchange between GPC and ambulance service. [23-25] Aging people, and the increasing proportion

of community-dwelling patients with chronic conditions, more frequently use acute care services and require more hospital days than younger people. [23, 24, 26] The inclusion criteria in this study were:

- Patients who have made an urgent care request to the GPC Nijmegen and according to the triage outcome received ambulance assistance
- Community-dwelling older persons aged over 70 years
- Potentially complex patients identified with multimorbidity (defined as: co-existence of two or more chronic conditions) [25]

Patients who met the inclusion criteria in the 12-month periods preceding and following the data merger (November 2016-November 2017 and November 2017-November 2018) were selected from the practice lists of the ambulance service and the GPC. The follow-up period for each patient was 30 days after the acute event. To determine the experiences of healthcare professionals, we recruited a network of healthcare professionals including emergency call handlers at the GPC Nijmegen and the dispatch centre, together with the ambulance personnel of ambulance service Gelderland-South.

Primary outcome: healthcare use and cost

Using a before-after design, the primary outcome was the difference in healthcare use in the follow-up period between patients in the control versus the intervention period. Healthcare use was assessed as the number of hospital admissions, admissions to a nursing home, and patient contact with their own GP, with the GPC, or with the ambulance service, all included in a case record form made by the researchers. Case record forms were sent to all GPs for each individual patient selected from the practice lists with a request to check the electronic medical record and to provide how often a patient used healthcare in the 30 days following an acute request. In anticipation of a poor response rate, researchers IT and SA offered assistance in the form of visits to the GP practices to gather data. To define healthcare costs we used reference prices from the Dutch manual for costing studies [27, 28] (2021 edition). [29] Hospital admission per day was costed at €523.60, an ED visit at €284.90, an emergency ambulance journey at €674.30, an GPC Nijmegen visit at €128.21 [30] and an own GP visit at €10.51. [31] Other outcomes such as nursing home admission could not be expressed monetarily due to lack of specific data.

Secondary outcome: the experiences of patients and health care professionals

To address our secondary research question (''What are the experiences of patients and care professionals in different acute healthcare organisations after implementation of the digital NTS merger?") a cross-sectional questionnaire survey was conducted amongst patients and healthcare professionals following

the intervention period. The experiences of professionals were further elaborated through structured discussion in a focus group. As no validated questionnaire exists that can measure patient experiences across the entire acute care network, we developed a questionnaire based on three validated Dutch Consumer Quality Index (CQI) questionnaires (CQI Emergency department, CQI ambulance care and CQI GPC), see appendix A.[32, 33] Patient experiences were assessed using several components, including overall satisfaction (experience of accessibility, contact with assistants, confidence in care expertise, expectations, communication, cooperation) and the grading of organisations on a scale of 0-10. Overall satisfaction was measured using the summed mean scores of all components, with a score of 1 indicating very dissatisfied, 3 neutral, and 5 very satisfied. The questionnaire to measure care professionals' experiences consisted of the validated 'Leiden Quality of Work Life Questionnaire', further supplemented with project-specific questions.[34] Questionnaires were sent digitally to the care professionals (see Appendix B). Professional experience was assessed using various subscales such as satisfaction, collaboration with chain partners, collaboration of care professionals within the organisation, completeness of transfer and confidence in the future. A subscale score was the sum of the item score (1 to 4). A focus group was organized to allow in depth discussion and exploration of the cooperation topics and to give professionals the opportunity to provide advice for further improvement. The focus group consisted of two call handlers from the GPC, two ambulance service call handlers, and one ambulance nurse, and took place on June 11th 2019 at the headquarters of the ambulance service Gelderland-South, with IT and SA acting as moderators.

Statistical analysis

Chi-square tests were performed to determine differences in proportions of binary healthcare use variables (such as hospitalisation in the 30 days after the acute care request [yes or no], ED visit, contact with ambulance service) between the control and intervention period. T-tests were used to determine differences in total healthcare costs per individual. Estimated healthcare costs were individually assessed by multiplying average cost price by healthcare use. Descriptive statistics were used to evaluate patient' experiences. We assessed the differences between subscale scores for the different professions by comparing the mean scores using one-way ANOVA tests. The effect of sex and average working hours per week between different professions was corrected for using linear regression. The audio recording of the focus group was transcribed verbatim, coded and labelled by IT and SA, and checked by RNM.

Statistical analyses were performed using SPSS Statistics 24 software program (IBM, Armonk, NY, USA). The study was registered and approved by the medical

research ethics committee of Leiden University Medical Centre (LUMC), P18.167.

Results

Primary outcome: healthcare use and costs

746 patients during the control period and 423 patients during the intervention period were included from the practice lists of the ambulance service and the GPC. We were able to complete file research on 163 of patients in the control period and on 104 patients in the intervention period. The reduced number of patients in the study population was due mainly to the difficulty of data collection in GP practices. Many GPs, burdened by their high workload, were hesitant to cooperate with the study by checking the electronic medical record and filling in how often a patient used healthcare in the 30 days following an acute request. Patient age and gender did not differ significantly between the two groups (p=0.338, p=0.328 respectively). Compared to patients in the control period, patients in the intervention period were hospitalized less often (52.9% vs 64.4%, p=0.061) and had fewer ED visits (58.7% vs 69.3%, p=0.074) in the 30 days after the acute care request with a possible trend towards significance. The number of nursing home admissions was lower during the intervention period compared to patients in the control period (2.9% vs 14.8%, p=0.002), and fewer ED costs were incurred compared to the control period (p=0.042). However, the opposite trend was seen for the GPC (p=0.002). All results are shown in table 1.

Table 1: Healthcare use and estimated costs (in 2021€)

Total group (n=267)	**Control period (n=163)**	**Intervention period (n=104)**	**P-value**
Patients characteristics			
Age, mean (±SD), years	79.78 (6.6)	78.95 (6.2)	0.338
Sex, n male (%)	66 (40.7)	46 (46.9)	0.328
Healthcare use in the 30 days after acute request			
Hospitalisation, n yes (%)	105 (64,4)	55 (52.9)	0.061
ED, n yes (%) GPC, n yes (%)	113 (69.3) 19 (11.7)	61 (58.7) 17 (16.3)	0.074 0.292
Emergency ambulance ride, n yes (%)	8 (4.9)	4 (3.8)	0.660
Own GP, n yes (%)	128 (78.5)	88 (84.6)	0.200
Admission to a nursing home, n yes (%)	24 (14.8)	3 (2.9)	0.002
Need of a district nurse, n yes (%)	36 (22.1)	24 (23.1)	0.848

Table 1: Continued

Total group (n=267)	Control period (n=163)	Intervention period (n=104)	P-value
Number of times healthcare use, when answer was yes			
Number of hospital admission, mean (±SD)	1.15 (0.4)	1.15 (0.4)	0.933
Number of hospitalization days, mean (±SD)	4.10 (7.4)	3.37 (5.7)	0.402
Number of ED visits, mean (±SD)	1.09 (0.3)	1.11 (0.3)	0.603
Number of GPC visits, mean (±SD)	1.26 (0.7)	1.81 (1.47)	0.161
Number of own GP visits, mean (±SD)	2.75 (1.9)	2.64 (1.8)	0.684
Number of emergency ambulance ride, mean (±SD)	1.13 (0.4)	1.25 (0.5)	0.624
Average costs per patient calculated with the reference prices [27-31]			
Hospitalization costs, mean (±SD)	€2147 (3851.5)	€1764 (2969.8)	0.625
ED costs, mean (±SD)	€215 (161.7)	€186 (172.0)	0.042
Emergency ambulance ride costs, mean (±SD)	€38 (173.2)	€32 (172.7)	0.627
GPC costs, mean (±SD)	€19 (61.2)	€36 (111.4)	0.002
Visit own GP costs, mean (±SD)	€22 (21.5)	€23 (20.5)	0.516
Costs together, mean (±SD)	€2468(3959.6)	€2046(3060.7)	0.671

Secondary outcome: patient and healthcare professional experiences

Patients experiences

We found 40 patients of 104 patients (38%) in the quantitative section to be available for questionnaire research regarding the intervention period due to drop-out for various reasons, with the most common reason being deceased. Of those completing the questionnaire, overall satisfaction with acute care was very high (4.63 [0.4SD] out of 5). Acute services also received very high scores (out of 10), with 7.9 (1.2SD) for GPC call handlers, 7.98 (1.2SD) for the overall GPC organisation and 8.67 (1.0SD) for the ambulance nurses (table 2). Nevertheless, 15% of the patients were not connected to a call handler within the prescribed two minutes. The final questionnaire question was: 'If you could name one thing, what would you like to change?' Of those who answered this open question, a faster transfer, better cooperation between the various care professionals, and less waiting at the ED were mentioned.

Table 2: Patients experiences with acute care

	Total group (n=40)
Patients characteristics	
Age, mean (±SD), years	78.72 (4.5)
Sex, n male (%)	20 (50.0)
Hospitalisation, n yes (%) ED visit, n yes (%) Contact GPC, n yes (%) Contact ambulance service, n yes (%)	16 (40.0) 20 (50.0) 4 (10.0) 3 (7.5)
Satisfaction, 1 means very dissatisfied, 5 very satisfied	
Overall satisfaction (±SD) **Average score, 0 means bad and 10 means excellent** Call handlers GPC (±SD)	4.63 (0.4) 7.9 (1.2)
GPC organisation (±SD)	7.98 (1.2)
Ambulance nurses (±SD)	8.67 (1.0)

Experience of care professionals

Of the 160 CAWI questionnaires sent to care professionals, 76 (48%) responded: 21 GPC call handlers, 13 dispatch centre call handlers and 42 ambulance nurses. From a maximum score of 4 (completely satisfied), the average score for the total group of 76 care professionals was 2.73 (±0.5 SD). The GPC call handlers scored significantly higher on all topics compared to the dispatch centre call handlers and the ambulance nurses (3.15 vs. 2.73 and 2.52, $p<0.01$ for both), table 3. Correction for sex ($\beta=0.134$ $p=0.186$) and average working hours per week ($\beta=-0.008$, $p=0.302$) using linear regression did not negate this effect.

Table 3: Experience of care professionals, CAWI questionnaire

	Total group ***(n= 76)***	**Call handler GPC (n=21)**	**Call handler dispatch center** ***(n= 13)***	**Ambulance nurse** ***(n= 42)***	**P-value**
Care professional characteristics					
Age, mean (±SD), years	46 (9)	45 (10)	50 (11)	46 (9)	0.400
Sex, male : female, n	30 : 46	0 : 21	6: 7	24 : 18	<0.01
Average working hours a week, mean (±SD)	29.17 (7.4)	21.19 (7.0)	30.31 (5.5)	32.81 (4.7)	<0.01
Work experience in profession, mean (±SD), years	14.76 (9.7)	14.71 (8.9)	14.54 (9.5)	14.86 (9.7)	0.994
Work experience within organisation, mean (±SD), years	10.87 (7.3)	9.95 (5.8)	13.38 (8.7)	10.55 (7.5)	0.383
Number of points per topics, maximum score 4					
Satisfaction, mean (±SD)	2.73 (0.6)	3.35 (0.3)	2.77 (0.5)	2.41 (0.6)	<0.01
Collaboration chain partners, mean (±SD)	2.70 (0.4)	2.90 (0.3)	2.65 (0.4)	2.61 (0.4)	0.017

Table 3: Continued

	Total group *(n= 76)*	**Call handler GPC (n=21)**	**Call handler dispatch center** *(n= 13)*	**Ambulance nurse** *(n= 42)*	**P-value**
Collaboration own organisation, mean (±SD)	3.06 (0.3)	3.34 (0.3)	2.91(0.3)	2.95 (0.3)	<0.01
Completeness transfer, mean (±SD) Confidence in future, mean (±SD)	2.44 (0.6) 2.72 (0.8)	2.85 (0.6) 3.29 (0.6)	2.62 (0.4) 2.69 (0.6)	2.18 (0.6) 2.45 (0.8)	<0.01 <0.01
All above components together, mean (±SD)	2.73 (0.5)	3.15 (0.3)	2.73 (0.5)	2.52 (0.4)	<0.01

A focus group was organised to discuss and explore cooperation topics in more detail and to allow professionals the opportunity to provide advice for further improvement. Various quotes (Q) from focus group members can be found in appendix C. All partners confirmed that the digital NTS merger allows faster transfer from the GPC to the ambulance service, and that less discussion is required prior to referral of a patient between organisations as transfer is easier to arrange (Q1). Further, care professionals reported less dissatisfaction among patients because they no longer had to repeatedly relate their case details to every individual care provider. As an example, an ambulance nurse can access patient details received by the call handler per telephone (Q2). However, ambulance nurses were still not completely satisfied with the content of the merged digital NTS, as they reported a large discrepancy between the information received from dispatch centre call handlers and the GPC call handlers (Q3, Q4). The extensive transfer details received from the GPC call handlers were not always felt to be useful or complete. This problem was partly caused by GPC call handlers not always being aware that some information available on their own computer screen, such as the medication list and patient history, was not automatically sent to the ambulance service (Q6-8). While the digital NTS merger was a worthwhile attempt to improve patient information transfer, there is clearly still room for improvement. During the discussions it quickly became apparent that the partners understood little about each other's organisation and work. As an example, they were unaware that they used the same NTS triage system, did not know how many ambulances were present in the region, where the chain partners worked, and so on (Q9-10). Nevertheless, the chain partners were in favour of further improvement of their collaboration, and mentioned during the focus group that this was the first opportunity to meet (Q11-12). They also indicated a preference for clear agreements concerning the information included in the transfer details and a clear agreement between the organisations on the determination of urgency. Joint trainers and courses were suggested (Q12-13) and in the future all chain partners would prefer to work together under one roof (Q14).

Discussion

The purpose of this evaluation was to determine the added value of implementing a merged digital NTS for acute care users with the highest risk for adverse outcomes. The Triple Aim seems to have been achieved in this population via this intervention.

Regarding the population health aspects of the Triple Aim, which in this context is healthcare use in a specialist setting, we noticed that the digital NTS merger was possibly beneficial with a significant reduction in admission to nursing homes (p=0.002) and a reduction in hospital admissions and ED visits with a possible trend towards significance (p=0.065, p=0.074). As for healthcare costs, we noted a decrease in average costs per patient calculated based on reference prices. During the intervention period, patients visited their own GP more often but the difference was not significant. Patients in the intervention period were also responsible for significantly greater costs at the GPC. A shift from intramural to extramural care may be underway and deserves further investigation. Earlier studies have reported conflicting results regarding the effectiveness of care coordination services, with variation probably attributable to differences in the intensity and duration of services. [35] An evaluation of participation in an ED-initiated community-based program reported significantly fewer ED visits and significantly more primary care visits.[36] Since ED care is more expensive then primary care, it appears that the cost benefits of the program are significant. [36, 37] The lack of a post-hoc power analysis does not allow us to address whether our negative conclusions are demonstrative of a lack of association between NTS-patient care and clinical outcomes, or reflective of an underpowered study. Power analysis requires accurate knowledge of outcome standard deviations within the analysis cohort, which was here not available given the novelty of the NTS approach. [38]

Besides population health and costs, overall satisfaction of patients with the acute care services was very high. The relatively high drop-out rate in the retrieval of questionnaires among patients during the intervention, made interpretation of qualitative data difficult. However, the results offer a glimpse into patient experiences with acute care in the region. The experience of care professionals also plays an important role and addressing the needs of this group adds a fourth policy aspect, leading to our referencing as 'Quadruple Aim'. [39] Regarding current satisfaction, the care professionals were generally fairly satisfied with cooperation to date. However, we noted major differences between the various professions, with the most satisfied group being the GPC call handlers. Focus group comments cast some light on differences in satisfaction, which seemed to be often linked to issues such as a lack of

understanding of the logistical details of digital transfer. Joint trainers and courses were suggested to improve collaboration, as well as more frequent meetings to gain a better understanding of each other's work. Other studies have reported less positive results concerning collaboration, but arrived at similar conclusions. Our results are in line with a Norwegian study reporting that smooth cooperation between GPs and ambulance personnel requires that both parties better understand each other's procedures and roles.[40]

Our results provide an early indication of the considerable promise of medical data merging. Given the small numbers in this study and the tentative but not conclusive results, we recommend a replication of this study in a larger context. Other studies have shown that collaboration between GPCs and ambulance services allows patients to avoid transfer to an ED, potentially avoid subsequent hospital admission, reduce cost and improve quality of care for those not actually needing hospital services.[41] However, none of these studies assessed use of services in the days following an acute call, a unique aspect of the current study. Since the design of our study was before-after, without the possibility for patient randomization, we should be careful when inferring causal effects due to the digital NTS merger. Other factors may have also played a role, such as the significantly lower number of nursing home admissions during the intervention period, an outcome that may have been influenced by 'aging-in-place' policies in the Netherlands that in recent years have substituted home care for nursing home admissions. [42] We therefore propose a randomized design for a follow-up study. We further learned that patient data collection in acute care is particularly challenging, as the first report is received by the GPC, subsequently forwarded to the ambulance service, and all subsequent treatment by different care providers must eventually be retrieved from the GP's patient file once completed. As a result, projects of this type have often 'just' started, without scientific evaluation. Additionally, due to the high GP practice workloads, GP's often feel unable to cooperate, an understandable reticence considering the large amount of work required to collect data from the medical records of each individual patients. The initial response rate of GPs via digital channels was small, but subsequent approaches by telephone were considerably more successful. We suggest investing in a research staff member specifically for data analytics and recommend the use of linked datasets between all acute services, understanding these are often not yet available in the Netherlands.

A systematic review of literature on the Triple Aim framework in the context of healthcare concluded that providers generally struggle due to a lack of guidance and an absence of a composite set of measurements that allow performance assessment. Available data therefore often lack clarity regarding the selection

and implementation of purposeful measures. [43] We propose that acute care initiatives should be evaluated withing a general framework in a consistent manner, an approach which will promote understanding of existing problems faced during the provision of acute services.

The results of this study suggest that a shift from intramural to extramural care is also possible in the case of acute care and may contribute to the sustainability of our healthcare system: a better quality of care requiring fewer resources, and acute care in the right place at the right time.

Conclusions

The Triple Aim for acute care can be met using relatively simple interventions, but medical data merging is a prerequisite for achieving more robust results covering on the various aspects of the Triple Aim. These successes should be communicated so that a common language can be developed that will support the successful further implementation of larger scale initiatives. The final aim of all initiatives should be an optimal acute care network for all citizens that is demonstrated by solid research.

Acknowledgement

This study was sponsored by InEen and Ambulancedienst Nederland. They played no role in the design, analysis, or decision to publish the results of this study.

References

1. Moskop JC, Sklar DP, Geiderman JM, Schears RM, Bookman KJ. Emergency department crowding, part 1--concept, causes, and moral consequences. Ann Emerg Med. 2009;53(5):605-11.
2. Pines JM, Hilton JA, Weber EJ, Alkemade AJ, Al Shabanah H, Anderson PD, et al. International perspectives on emergency department crowding. Acad Emerg Med. 2011;18(12):1358-70.
3. Bittencourt RJ, Stevanato AM, Bragança C, Gottems LBD, O'Dwyer G. Interventions in overcrowding of emergency departments: an overview of systematic reviews. Rev Saude Publica. 2020;54:66.
4. Chan SS, Cheung NK, Graham CA, Rainer TH. Strategies and solutions to alleviate access block and overcrowding in emergency departments. Hong Kong Med J. 2015;21(4):345-52.
5. CO I. Burnout among after-hours home visit doctors in Australia. BMC family practice 2016;17(1):2.
6. Inspectie Gezondheidszorg en Jeugd. Ministerie van Volksgezondheid WeS. In openheid leren van meldingen. Meldingen medisch specialistische zorg, verpleeghuiszorg en thuiszorg in 2016 en eerste helft 2017, en boetebesluiten en tuchtklachten in 2016. 2017.
7. Nederland A. Sectorkompas ambulancezorg. Tabellenboek 2017. 2017.
8. Starfield B, editor Is strong primary care good for health outcomes. The future of primary care: Papers for a symposium held on 13th September 1995; 1996: Office of Health Economics.
9. Kulu-Glasgow I, Delnoij D, de Bakker D. Self-referral in a gatekeeping system: patients' reasons for skipping the general-practitioner. Health policy. 1998;45(3):221-38.
10. Van der Maas J RM, Smits M, van Boven K,, P. G. Spoedzorg in de huisartsenpraktijk: onderzoek naar de contactfrequentie, patiënten zorgkenmerken. Huisarts en Wetenschap 2018; 61: 36-43. 2018.
11. van der Wulp I, van Baar ME, Schrijvers AJ. Reliability and validity of the Manchester Triage System in a general emergency department patient population in the Netherlands: results of a simulation study. Emerg Med J. 2008;25(7):431-4.
12 . DutchHealthcareAuthority. Market scan acute care [in Dutch: Marktscan acute zorg 2017]. https://pucoverheidnl/nza/doc/PUC_3650_22/1/. 2017.
13. Kodner DL. All together now: a conceptual exploration of integrated care. Healthc Q. 2009;13 Spec No:6-15.
14. Stange KC. The problem of fragmentation and the need for integrative solutions. Ann Fam Med. 2009;7(2):100-3.
15. Frandsen BR, Joynt KE, Rebitzer JB, Jha AK. Care fragmentation, quality, and costs among chronically ill patients. Am J Manag Care. 2015;21(5):355-62.
16. Zorgautoriteit N. Monitor acute zorg 2018. 2018.
17. Drijver R. Continuïteit in de acute zorg. Huisarts en wetenschap. 2006;2006, 49.11: 810-811.
18. van Ierland Y, van Veen M, Huibers L, Giesen P, Moll HA. Validity of telephone and physical triage in emergency care: the Netherlands Triage System. Fam Pract. 2011;28(3):334-41.
19. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health affairs (Project Hope). 2008;27(3):759-69.

20. Stiefel M, Nolan K. A guide to measuring the triple aim: population health, experience of care, and per capita cost. IHI Innovation Series white paper Cambridge, Massachusetts: Institute for Healthcare Improvement. 2012.
21. Minderhout RN et al. A Population Health Management methodological framework for evaluating transitions in acute care services in the Netherlands [to be published].
22. Steenkamer BM, Drewes HW, Heijink R, Baan CA, Struijs JN. Defining Population Health Management: A Scoping Review of the Literature. Popul Health Manag. 2017;20(1):74-85.
23. George G, Jell C, Todd B. Effect of population ageing on emergency department speed and efficiency: a historical perspective from a district general hospital in the UK. Emergency Medicine Journal. 2006;23(5):379-83.
24. Wass A, Zoltie N. Changing patterns in accident and emergency attenders. Emergency Medicine Journal. 1996;13(4):269-71.
25. Boyd CMaF, M. . Future of multimorbidity research: how should understnading of multimorbidity inform health system design? Public health reviews. 2010;32(2), 451.
26. Sanders AB. Care of the elderly in emergency departments: conclusions and recommendations. Annals of emergency medicine. 1992;21(7):830-4.
27. Kanters TA, Bouwmans CAM, van der Linden N, Tan SS, Hakkaart-van Roijen L. Update of the Dutch manual for costing studies in health care. PLoS One. 2017;12(11):e0187477.
28. Hakkaart - van Roijen L VdLN, Bouwmans CAM, Kanters TA, Tan SS. Kostenhandeliding. Methodologie van kostenonderzoek en referentieprijzen voor economische evaluaties in de gezondheidszorg. Zorginstituut Nederland. Geactualliseerde versie 2015.
29. CBS. https://opendata.cbs.nl/statline#/CBS/nl/. 19 januari 2021.
30. Autoriteit NZ. https://puc.overheid.nl/nza/doc/PUC_628718_22/1/ 2021.
31. Zorgautoriteit N. Prestatie- en tariefbeschikking huisartsenzorg en multidisciplinaire zorg 2021 - TB/REG-21627-02. file:///H:/Roaming/Downloads/prestatie-_en_tariefbeschikking_huisartsenzorg_en_multidisciplinaire_zorg_2021_-_tbreg-21627-02%20(1)pdf. 2021.
32. Bos N, Sturms LM, Stellato RK, Schrijvers AJ, van Stel HF. The Consumer Quality Index in an accident and emergency department: internal consistency, validity and discriminative capacity. Health Expect. 2015;18(5):1426-38.
33. Smirnova A, Lombarts K, Arah OA, van der Vleuten CPM. Closing the patient experience chasm: A two-level validation of the Consumer Quality Index Inpatient Hospital Care. Health Expect. 2017;20(5):1041-8.
34. M. van der Doef SM. The Leiden Quality of Work Questionnaire: its construction, factor structure, and psychometriq qualities. Psychological reports. 1999;85.3: 954-962.
35. Katz EB, Carrier ER, Umscheid CA, Pines JM. Comparative effectiveness of care coordination interventions in the emergency department: a systematic review. Annals of emergency medicine. 2012;60(1):12-23. e1.
36. Capp R, Misky GJ, Lindrooth RC, Honigman B, Logan H, Hardy R, et al. Coordination program reduced acute care use and increased primary care visits among frequent emergency care users. Health Affairs. 2017;36(10):1705-11.
37. Lee MH, Schuur JD, Zink BJ. Owning the cost of emergency medicine: beyond 2%. Annals of emergency medicine. 2013;62(5):498-505. e3.
38. Lenth RV. Post hoc power: tables and commentary. Iowa City: Department of Statistics and Actuarial Science, University of Iowa. 2007:1-13.
39. Bachynsky N. Implications for policy: The Triple Aim, Quadruple Aim, and interprofessional collaboration. Nurs Forum. 2020;55(1):54-64.

40. Førland O ZE, Hunskår S. Samhandling mellom ambulansearbeider og legevaktlege Cooperation between ambulance personnel and regular general practitioners. Tidsskr Nor Laegeforen. 2009 May 28;129(11):1109-11. Norwegian. ;doi: 10.4045/tidsskr.08.0501. PMID: 19488093.
41. Villarreal M, Leach J, Ngianga-Bakwin K, Dale J. Can a partnership between general practitioners and ambulance services reduce conveyance to emergency care? Emergency Medicine Journal. 2017;34(7):459-65.
42. Bakx P, Wouterse B, van Doorslaer E, Wong A. Better off at home? Effects of nursing home eligibility on costs, hospitalizations and survival. J Health Econ. 2020;73:102354.
43. Obucina M, Harris N, Ja F, Chai A, Radford K, Ross A, et al. The Triple Aim framework in the context of primary healthcare: A systematic literature review. 2018.

Additional material Chapter 3

Appendix A: Care experience of patients with regard to the digital NTS merge

Q1	Did you receive an assistant on the phone within 2 minutes when you called the out-of-ours GP service?
Q2	What score do you give the out-of-hours GP service as an organisation? 0 means very bad, 10 means excellent
Q3	What score would you give the assistant on the phone of the out-of-hours service? 0 means very bad, 10 means excellent
Q4	What did you expect form the assistance when you contact them?
Q5	The care professionals have met my expectations
A	I was happy that the assistant of the out-of-hours GP service deployed an ambulance
B	Thanks to the good cooperation between the out-of-hours GP service and ambulance service, I have received good care
C	
D	The ambulance nurse was aware of medical information that I had discussed on the phone with the assistant of GP service
E	I am satisfied with the care I received from the GP service
F	I got the help as soon as I wanted
G	I was confident in the expertise of the assistant on the phone
H	I think the assistant has made the right choice for me to deploy an ambulance
I	I was confident with the treatment
J	I got the help I needed
K	I am satisfied with the care I received from the ambulance
L	If a friend of mine had the same complaints, I would advise him to contact the GP service
Q7	Did the ambulance nurse tell you who to contact if you were concerned about your health problem after he left?
Q8	What score would you give the ambulance nurse? 0 means very bad, 10 means excellent
Q9	I have spoken or seen the following care professionals after ambulance care:
Q10	Did the different care professionals (as mentioned in Q10) work together?
Q11	Was the following care professional (doctor or nurse) aware of the information that you had discussed with the ambulance
Q12	How was your health before the report?
Q13	How is your health at the moment?
Q14	What would you like to change if you can name one thing?

Appendix B: Computer Assisted Web Interviews (CAWI) for care professionals with regard to the digital NTS merge

Subject Code		Statement
Satisfaction	S1	The collaboration within the project has been of added value for the quality of patient care
	S2	The project has improved the cooperation between the chain partners
	S3	Due to the increasing cooperation with other care providers, I am afraid of losing my autonomy
	S4	The increasing cooperation with other care providers is of added value to me as a care provider
	S5	Due to the increasing cooperation between care providers, I am afraid to give up some of my professionalism
	S6	The digital NTS merge gives me confidence in the future
	S7	The digital NTS merge motivates to further expand the collaboration
Collaboration of different care professionals with chain partners	CC1	Clear working agreements have made between chain partners
	CC2	There is a good mutual cooperation with my chain partners
	CC3	I see other care providers within the acute care chain as colleagues rather than as competitors
	CC4	The mutual communication is going well between my chain partners
	CC5	I have faith in the competence of my chain partners
	CC6	I feel appreciated by my chain partners
	CC7	My chain partners criticize my organisation in an annoying way
	CC8	My chain partners offer me a helping hand when needed
	CC9	I experience respect between the various chain partners
	CC10	I feel free to talk to my chain partners about the policies they have implemented
	CC11	The chain partners have a good understanding of everyone's responsibilities
Collaboration of care professionals within the own organisation	CO1	Clear work agreements have been made within my organisation
	CO2	There is a good mutual cooperation within my organisation
	CO3	I see other care providers within my organisation as colleagues rather than as competitors
	CO4	The mutual communication is going well between my colleagues
	CO5	I have faith in the competence of my colleagues
	CO6	Within my organisation I feel appreciated by my colleagues
	CO7	Within my organisation, employees criticize each other in an annoying way
	CO8	Within my organisation, my colleagues offer a helping hand when needed
Completeness transfer	T1	When I transfer a patient, I receive complete and correct information from my chain partner
	T2	Since the NTS merge, I have received more complete and correct information from my chain partner when transferring a patient than before the project.
	T3	When a patient is transferred, I receive complete and correct information from my colleagues within my organisation
	T4	Since the NTS merge, I have received more complete and correct information from my colleagues within my organisation

Confidence in the future	F1	I have faith in good cooperation within the future acute care

The answer categories of all these statements were as follows: (i) Strongly disagree (ii) Disagree, (iii) Agree and (iv) Strongly agree.

Wat is your profession?	Ambulance nurse Ambulance service medical dispatcher Out-of-hours GP service medical dispatcher
Wat is your age?	.. year
Wat is your gender?	Male Female
How many hours do you work per week on average?	.. year
How many years of work experience do you have in your profession?	.. year
How many years of work experience do you have within your organisation?	.. year

Appendix C: Quotes from the focus group

Topic	**Quote**
Satisfaction	Q1. Call handler ambulance service: ''Well I think it's positive that we don't have to start a discussion anymore. They no longer have to 'sell' the ambulance ride to us..''
	Q2. Ambulance nurse: '' So there is great benefit in that the patient does not have the dissatisfaction of telling the story twice.''
	Q3. Ambulance nurse: '' We notice that we get a whole piece of text that is written in a completely different way and order than they [call handlers ambulance service] write [...] and which I cannot do very much.''
	Q4. Call handler ambulance service: ''Our text is much shorter and more succinctly addressed to an urgency and you [call handlers out-of-hours GP service] are more elaborate. That's the difference I think.''
Completeness transfer	Q5. Ambulance nurse: ''I cannot read much information about the patient, such as medication use and history.''
	Q6. Call handler out-of-hours GP service: ''..because of course we have patients' history and medication visible in our computer system, does that automatically go along? I was curious about that.''
	Q7. Ambulance nurse: ''No, I would really like to have that information.....''
	Q8. Call handler out-of-hours GP service: ''That is why we have not filled it in until now, because we already see this information on our computer screen.''
Collaboration	Q9. Call handler out-of-hours GP service: ''Because you [call handler ambulance service] also do triage via NTS?''
	Q10. Call handler ambulance service: ''Yes I do.''
	Q11. Call handler out-of-hours service: ''... which is why I wanted to participate this focus group. I want to be able to work together more easily.''
	Q12. Call handler ambulance service: ''Sure, I want to work towards better cooperation.''
Future	Q13. Call handler out-of-hours GP service: ''If you take a look behind the scenes of the other organisation, you know exactly what you are talking about.''
	Q14. Call handler ambulance service: ''You work together by being together!''

Supplement I: Dubbelpublicatie Huisarts & Wetenschap

De meerwaarde van koppeling gegevens ambulancedienst en huisartsenpost
Acutezorgorganisaties zijn vaak overbelast en daarom zijn er verschillende innovatieprojecten gestart. Het evalueren van deze acutezorgprojecten blijkt in de praktijk lastig. Wij evalueerden een interventie van een ambulancedienst en huisartsenpost, die zijn gestart met het integreren van hun zorg door gegevens te koppelen. Voor de evaluatie maakten we gebruik van de Triple Aim-uitkomsten (het verbeteren van de zorgervaring en de gezondheid, en het verlagen van de kosten).

Inleiding

Acutezorgorganisaties als de huisartsenpost (HAP), spoedeisende hulp (SEH) en ambulancedienst ervaren een enorme druk. Patiënten met een acute zorgvraag kunnen in ons zorgsysteem verschillende routes doorlopen. Dat er meerdere in- en uitgangsroutes zijn, verhoogt de druk op alle acutezorgorganisaties en bovendien leidt het grote aantal organisaties tot versnippering van de zorg. Die versnippering lijkt gerelateerd te zijn aan hogere zorgkosten, een kleinere kans om de best mogelijke zorg te krijgen en hogere percentages vermijdbare ziekenhuis(her)opnamen. Om de coördinatie en efficiëntie van de acute zorg in Nederland te verbeteren en de toegankelijkheid in de toekomst te behouden, is het van cruciaal belang om de integratie tussen professionals en organisaties te bevorderen.

De ambulancedienst Gelderland-Zuid en de HAP Nijmegen zijn begonnen met het integreren van hun zorg door het realiseren van een snelle en volledige overdracht van informatie tussen deze 2 organisaties. Beide diensten gebruiken de gevalideerde Nederlandse Triage Standaard (NTS) om zorgverzoeken op urgentie te prioriteren. Bij een hoge urgentie kan de zorgverlener patiënten die de HAP bellen direct doorverwijzen naar de ambulancedienst. In oktober 2017 vond een digitale NTS-koppeling plaats om de verwijzing van de HAP naar de ambulancedienst te ondersteunen met een digitale overdracht van patiëntinformatie. Ons onderzoek richtte zich op het evalueren van de digitale NTS-koppeling met de doelen van de Triple Aim-aanpak. Triple Aim definieert verbetering van een gezondheidszorgsysteem met het gelijktijdig nastreven van 3 gekoppelde doelen: het verbeteren van de individuele ervaring van de zorg, het verbeteren van de gezondheid van de bevolking en het verlagen van de kosten van de gezondheidszorg per hoofd van de bevolking. Met ons onderzoek wilden we nagaan of de NTS-koppeling een meerwaarde heef in termen van zorggebruik en zorgkosten. Verder wilden we weten hoe de patiënten en medewerkers van de betrokken organisaties de koppeling hadden ervaren.

Methode

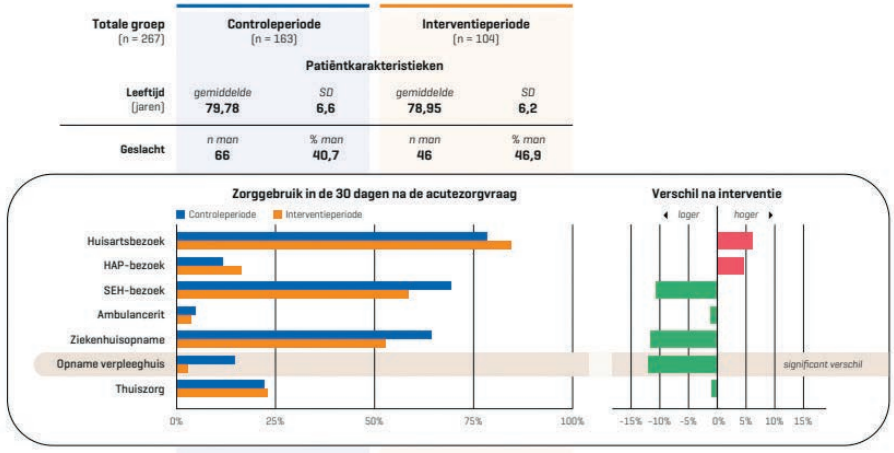
We voerden een mixed-methods-onderzoek uit om de NTS-koppelinginterventie te evalueren. Om zorggebruik en zorgkosten te bekijken, vergeleken we 2 groepen patiënten met elkaar. Aan de ene kant patiënten die in de 12 maanden voorafgaand aan de NTS-koppeling bij de HAP een acute zorgvraag hadden ingediend waarvoor de ambulancedienst was ingezet, aan de andere kant patiënten met overeenkomstige kenmerken in de 12 maanden na de start van de NTS-koppeling. De Triple Aim-aanpak begint met het definiëren van een specifieke populatie met een hoog risico op nadelige uitkomsten. We hebben dit geoperationaliseerd door patiënten te identificeren die mogelijk het hoogste risico lopen op nadelige uitkomsten die kunnen ontstaan door slechte informatie-uitwisseling tussen de HAP en ambulancedienst: thuiswonende ouderen van 70 jaar en ouderen met multimorbiditeit. Uit de werklijsten van de ambulancedienst en HAP selecteerden we patiënten die aan de inclusiecriteria voldeden. De follow-up van iedere patiënt vond 30 dagen na de acute zorgvraag plaats. Zo kregen we een goed beeld van het verschil in zorggebruik en zorgkosten tussen de 2 groepen. Zorggebruik betref het aantal ziekenhuisopnamen, opnamen in een verpleeghuis en contact met de huisarts, HAP of ambulancedienst in de 30 dagen na de acute zorgvraag. Deze gegevens vroegen we op bij de huisartsen van alle individuele patiënten. Voor het beoordelen van de zorgkosten gebruikten we referentieprijzen die zijn bijgewerkt tot 2021. Om de ervaringen van patiënten en zorgprofessionals van de betrokken organisaties tijdens de interventieperiode te achterhalen, namen we vragenlijsten af. De ervaringen van zorgprofessionals onderzochten we verder met een focusgroep, die bestond uit 2 triagisten van de HAP, 2 triagisten van de ambulancedienst en een ambulanceverpleegkundige.

Resultaten

In totaal voldeden 746 patiënten uit de controleperiode en 423 patiënten uit de interventieperiode aan de inclusiecriteria. Bij 163 patiënten uit de controleperiode en 104 patiënten uit de interventieperiode hebben we dossieronderzoek kunnen verrichten. Dit grote verschil ontstond voornamelijk doordat het lastig was om gegevens in huisartsenpraktijken te verzamelen. Veel huisartsen van de geïncludeerde patiënten vulden de vragenlijsten over zorggebruik niet in, wat volgens hen kwam door de reeds bestaande hoge werkdruk. Om de respons te verbeteren, hebben 2 onderzoekers uit het team aangeboden om de praktijken te bezoeken en de gegevens te verzamelen. Vergeleken met patiënten in de controleperiode waren er in de interventieperiode minder verpleeghuisopnamen, lagen de gemiddelde SEH-kosten per patiënt lager en waren de gemiddelde HAP-kosten per patiënt hoger [infographic]. Tevredenheid onder patiënten en zorgprofessionals Veertig van de 104 patiënten (38%) van de interventieperiode namen deel aan het

vragenlijstonderzoek naar patiënttevredenheid. De algehele tevredenheid over de acute zorg was erg hoog, namelijk 4,63 (± 0,4 sd), met een schaalverdeling van 1 (zeer ontevreden) tot 5 (zeer tevreden). Ook waren deze patiënten erg tevreden over hun ervaring met de triagisten van de HAP (7,9 ± 1,2 sd), de HAP als organisatie (7,98 ± 1,2 sd) en de ambulanceverpleegkundigen (8,67 ± 1,0 sd), met een maximale score van 10. De laatste vraag uit de vragenlijst was: 'Als je 1 ding zou kunnen noemen, wat zou je dan willen veranderen?' Degenen die deze open vraag beantwoordden, noemden een snellere overdracht, betere samenwerking tussen verschillende zorgprofessionals en minder lang wachten op de SEH. We stuurden 160 digitale vragenlijsten over de tevredenheid over de samenwerking na de NTS-koppeling aan zorgprofessionals van de betrokken organisaties, waarvan we er 76 (48%) terugkregen. De totale tevredenheid van de 21 triagisten van de HAP, 13 triagisten van de meldkamer van de ambulancedienst en 42 ambulanceverpleegkundige was 2,73 (± 0,5 sd) met een maximumscore van 4. De triagisten van de HAP waren tevredener over alle onderwerpen, onafhankelijk van geslacht en gemiddelde werkuren per week. Tijdens het focusgroepgesprek werd duidelijk waar dit verschil vandaan kwam. Alle deelnemers bevestigden dat de digitale NTS-koppeling een snellere overdracht van de HAP naar de ambulancedienst mogelijk maakt. Verder bemerkten ze minder onvrede onder patiënten, omdat zij hun verhaal niet steeds opnieuw aan elke individuele zorgverlener hoefden voor te leggen. Ambulanceverpleegkundigen waren echter nog steeds niet helemaal tevreden over de inhoud van de digitale NTS-koppeling. De uitgebreide overdrachtsgegevens van de triagist van de HAP vonden ze niet altijd nuttig of volledig. Dit probleem ontstond mede doordat triagisten van de HAP niet altijd wisten dat bepaalde informatie (onder andere de medicatielijst en voorgeschiedenis) die op hun eigen computerscherm zichtbaar was, niet automatisch naar de ambulancedienst werd verstuurd. Verder hadden de zorgprofessionals weinig kennis van elkaars organisatie en werk. Zo wisten ze niet dat ze hetzelfde triagesysteem gebruikten, en wisten de triagisten van de HAP niet hoeveel ambulances er in de regio waren, waar de ketenpartners werkten, enzovoort. Toch waren de ketenpartners voorstander van een verdere uitbreiding van de samenwerking en gaven ze tijdens het focusgroepgesprek aan dat dit de eerste gelegenheid was waarop ze elkaar ontmoetten. Ook gaven ze de voorkeur aan duidelijke afspraken over de gewenste inhoud van een digitale overdracht.

Infographic



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Beschouwing

We hebben gekeken wat de toegevoegde waarde is van het implementeren van een digitale NTS-koppeling tussen de HAP en ambulancedienst voor acutezorggebruikers met het hoogste risico op nadelige uitkomsten. Gedurende de interventieperiode werden minder patiënten in het verpleeghuis opgenomen. We zagen een daling van de gemiddelde SEH-kosten per patiënt, maar een stijging van de kosten voor de HAP. De reductie van de gemiddelde SEH-kosten was veel groter dan de kostentoename voor de HAP, maar de totale kosten verschilden niet significant. Er is mogelijk een verschuiving van intramurale naar extramurale zorg gaande, die nader onderzoek verdient. Eerdere onderzoeken rapporteren tegenstrijdige resultaten wat betref de effectiviteit van zorgcoördinatieprojecten. Die variatie is waarschijnlijk toe te schrijven aan verschillen in de intensiteit en duur van de projecten. Zorgprofessionals van de betrokken organisaties bleken redelijk tevreden over de samenwerking, maar we constateerden wel grote verschillen tussen de verschillende beroepen. De focusgroep gaf opheldering over deze verschillen in tevredenheid, die werden veroorzaakt door een gebrek aan kennis en informatie over de andere organisaties, en gebrek aan inzicht in welke informatie de andere partij via de digitale NTS-koppeling kreeg. De focusgroepdeelnemers suggereerden dat gezamenlijke trainingen en cursussen de samenwerking zouden kunnen verbeteren, net als frequentere ontmoetingen om elkaars werk beter te begrijpen. Het implementeren van een digitale NTS-koppeling tussen de HAP en ambulancedienst voor acutezorggebruikers met het hoogste risico op nadelige uitkomsten lijkt waardevol met het oog op Triple Aim-uitkomsten. Vanwege de kleine aantallen in dit onderzoek raden we wel aan om het in een

bredere context te herhalen. Verder hebben we geleerd dat het verzamelen van patiëntgegevens in de acute zorg een bijzonder uitdagende opdracht is, omdat we de informatie uit verschillende bronnen moesten halen. Zo moesten we informatie over de spoedmelding vergaren bij de HAP en de ambulancedienst, waarna we alle daaropvolgende informatie over mogelijke behandelingen door verschillende zorgverleners moesten verkrijgen bij de huisartsen van alle individuele patiënten. In de praktijk begint dit soort evaluaties dan ook vaak zonder wetenschappelijke evaluatie.

Conclusie

Om goede acute zorg te garanderen en de toegankelijkheid ervan te behouden, vinden er verschillende innovaties plaats op het gebied van coördinatie en efficiëntie. Het implementeren van een digitale NTS-koppeling tussen de HAP en ambulancedienst lijkt toegevoegde waarde te hebben met het oog op Triple Aim-uitkomsten. Gezien de kleine aantallen in dit onderzoek raden we aan het in een bredere context te herhalen. Wanneer we robuustere resultaten willen, moeten de verschillende medische gegevens worden samengevoegd.

Chapter 4

Understanding people who self-referred in an emergency department with primary care problems during office hours

A qualitative interview study with people who self-referred at a Daytime General Practice Cooperative in two hospitals in The Hague, The Netherlands

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BMJ Open – 2019 Jun
DOI: 10.1136/bmjopen-2019-029853

Abstract

Objective To provide insight into the motives for hospital self-referral during office hours and the barriers deterring general practitioner (GP) consultation with a primary care request.

Setting People who self-referred at an Daytime General Practice Cooperative (GPC) in two hospitals in The Hague, The Netherlands.

Participants A total of 44 people who self-referred were interviewed in two hospitals. The average age of interviewees was 35 years, a parent of a young patient was interviewed, but the age of patients is shown here. There were more male patients (66%) than female patients (34%). Patients were recruited using a sampling method after triage. Triage was the responsibility of an emergency department (ED) nurse in one hospital and of a GP in the other. Those excluded from participation included (a) children under the age of 18 and not accompanied by a parent or legal guardian, (b) foreign patients not resident in the Netherlands, (c) patients unable to communicate in Dutch or English and (d) patients directly referred to the ED after triage by the GP (in one hospital).

Results People who self-referred reported several motives for going to the hospital directly. Information and awareness factors played an important role, often related to a lack of information regarding where to go with a medical complaint. Furthermore, many people who self-referred mentioned hospital facilities, convenience and perceived medical necessity as motivational factors. Barriers deterring a visit to the own GP were mainly logistical, including not being registered with a GP, the GP was too far away, poor GP telephone accessibility or a waiting list for an appointment.

Conclusion Information and awareness factors contribute to misperceptions among people who self-referred concerning the complaint, the GP and the hospital. As a range of motivational factors are involved, there is no straightforward solution. However, better dissemination of information might alleviate misconceptions and contribute to providing the right care to the right patient in the right setting.

Article Summary

- The study included an interview topic list that covered the entire I-Change Model.
- Our preliminary analysis allowed us to conduct later interviews in a more in-depth manner.

- The first study based on a wide range of interviews conducted in Daytime General Practice Cooperatives in the Netherlands.
- Non-Dutch-speaking patients and some immigrants, mainly of eastern European origin, declined our invitation to participate which limits the generalisability of the results.
- As this was an interview study, patients might have given socially acceptable answers.

Background

Emergency departments (ED) are often overcrowded in the western industrialised world.[1] The consequences of high ED crowding are greater inpatient mortality, increased length of hospital stay and increased hospital costs.[2]

The Netherlands also faces the problem of ED crowding.[3, 4] In the Netherlands the general practitioner (GP) acts as a gatekeeper at the primary care level, deciding whether to refer a patient to secondary healthcare. This important role generally results in lower health care costs for the society.[5] With a referral from their GP, patients are able to utilize secondary healthcare and will be eligible for reimbursement.[6] Patients with medical problems usually visit their own GP during office hours, even when problems are perceived as urgent or threatening. [7] After office hours patients with an acute care request can report to an out-of-hours GP service or, when a request is very urgent, they can call an emergency telephone number (112). Nevertheless, some patients, termed people who self-referred, go directly to the ED without first consulting a GP.[8] Self-referral often results in the improper use of an ED due to a care request that in retrospect could be better treated in a primary care setting. Here we refer to such cases as 'primary care problems', cases that can be reasonably regarded as 'inaccurate people who self-referred' as these patients should have first consulted their own GP during office hours rather than the ED.[9] Some studies have reported that approximately half of all people who self-referred at the ED were eligible for GP care.[8, 10, 11]

Due to perceived overcrowding and unnecessarily high costs at ED due to a high number of people who self-referred, the need arose to reduce people who self-referred by implementing a policy of 'the right care for the right patient in the right setting'. [12] This means generalist (primary) care when possible and specialist (secondary) care when necessary. Nowadays, may hospitals in the Netherlands have an integrated system with a General Practice Cooperative (GPC), located close to or within the hospital ED, to ensure that people who self-referred with primary care problems can be seen by a GP out of office hours. [13, 14] This approach to ED self-referral resulted in a decrease from 30% nationwide

in 2012, [15, 16] with outliers of 47% in Rotterdam and 61% in The Hague, [17] to 17.4% nationwide in 2015. Consequently, the proportion of patients referred by a GP or GP services increased by 7.8%.[16] With this aim in mind, GP organisations, health insurance companies and two hospitals in the highly urbanized Dutch city of The Hague together developed a scheme to improve care for people who self-referred visiting an ED. This scheme involved establishing GPCs at both hospitals, to which people who self-referred in need of primary care could be reassigned.

The unique feature of the two GPCs in The Hague is not their location within the hospital, but the fact that they are open during office hours, hence the name 'Daytime GPC'. These GPCs are the first to open during office hours in The Netherlands. The benefits of Daytime GPCs include relief of pressure on the ED during office hours, a need for fewer medical staff and lower costs for the hospital. Furthermore, general health costs are reduces because a visit to a Daytime GPC is much cheaper than an average ED visit. As an example, stitching a small wound costs at least €245 at the ED[18] but only €95 at a Daytime GPC.[19] Cost-wise, GP care is also preferable from a patient's perspective, because it is always covered by health insurance, whereas hospital care, including ED visits, falls under health insurance deductible cost which can vary between €385 to €885 annually.[20]

Daytime GPC is a new phenomenon and as such the motivation of users is not always clear. Several studies have investigated the characteristics of people who self-referred to an ED. Most patients are male, aged between 15 and 40, single, have a musculoskeletal injury or trauma, do not have children and live in a city.[10, 11, 17, 21-24] Many people who self-referred felt that their symptoms were too severe for a GP visit.[17, 25-27] Other motives included expectations regarding a need for radiologic or laboratory tests, an advice from a friend or someone else and the convenience of the ED (closer, faster, no need to make an appointment). [17, 22, 26, 27] Other factors influencing the number of people who self-referred were the availability and telephone accessibility of GPs and the likelihood of an appointment on the same day.[25, 28-30]

A potential disadvantage of a Daytime GPC is that people who self-referred may be encouraged to go to a hospital rather than their own GP. As a visit to a Daytime GPC is ten times more expensive than a visit to a family GP [31] it is important that inaccurate people who self-referred are redirected to their own GP first. To fill gain better insight into the motives of users of a Daytime GPC in particular, this study focused on people who self-referred at the two Daytime GPCs in The Hague. The aim of this qualitative study was to answer two questions: 1) What motivates people who self-referred to choose a hospital

rather than their GP? and 2) What deters people who self-referred from going to their own GP with a daytime acute care request?

Methods

Patient and public involvement

Patients were not actively involved in the development of the research question and outcome measures. The results of the study will be shared with the two Daytime GPCs in The Hague and are therefore accessible to patients.

Procedure

We performed a qualitative study involving semi-structured interviews with 44 people who self-referred who visited an ED of one of two hospitals in The Hague during office hours and were seen at the Daytime GPC. Patients were recruited using a sampling method, patients who had been living in the Netherlands for at least two months were asked. Triage was the responsibility of an ED nurse in one hospital and of a GP in the other. After triage, all people who self-referred attended one of the two Daytime GPCs in The Hague between 8:00 am and 5:00 pm, at a time when the interviewer was also present. Altogether 81 candidates were asked to participate in the study and were given an information leaflet. Those excluded from participation included (a) children under the age of 18 and not accompanied by a parent or legal guardian, (b) foreign patients not resident in the Netherlands, (c) patients unable to communicate in Dutch or English and (d) patients directly referred to the ED after triage by the GP (in one hospital). In both hospitals some patients did not wish to participate, mainly due to time constraints that precluded an interview. Following a preliminary analysis of the first 32 interviews, we focused on obtaining more in-depth information on five topics from our list. Patients interviews were terminated after 44 interviews, the point at which no new information was forthcoming regarding the research questions. The study was designed to continue to a saturation point, represented by the moment during data analysis when the same themes continually recur. At this point additional interviews provide no new insights. [32] For further details on the recruitment of participants, see figure 1. Patients provided written informed consent and all interviews were audio recorded. Patients could withdraw at any time without explanation. The interviews were transcribed and anonymized. The study was registered and approved by the medical research ethics committee of Leiden University Medical Centre (LUMC).

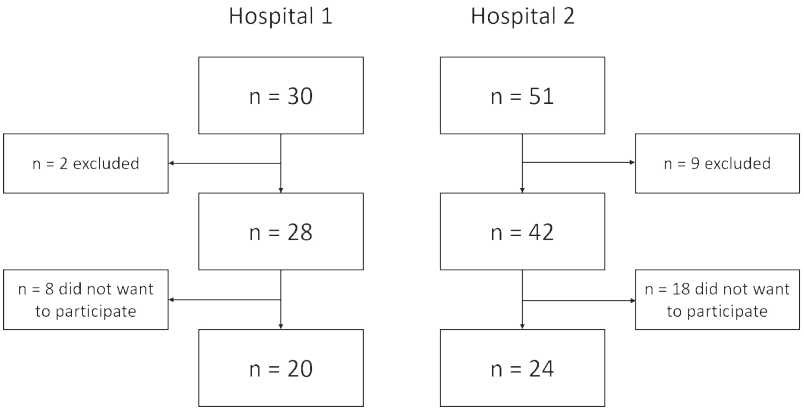

Figure 1 Recruitment of people who self-referred in two hospitals in The Hague.

Interviews

The 44 interviews took place in two Daytime GPCs in The Hague during October 2018 and were conducted in Dutch or English. Patients were interviewed in a separate room to guarantee privacy, and after a short introduction audio recording began. The recordings ranged from 4:32 to 14:50 minutes. The first questions were designed to provide baseline knowledge, after which topics from the interview guide were discussed. The topic list (see appendix A) was based on literature research and the Integrated Model for explaining motivational and behavioural change (I-Change Model) of de Vries et al. (figure 2).[33] This model offers insight into the motivational factors underlying a patient's decision to go directly to a hospital and the barriers deterring patients from going to their own GP. After a preliminary analysis of the first 32 interviews, six topics were chosen for more extensive discussion in the following interviews. These topics were: the accessibility of the GP, perception of urgency, being encouraged by another person, knowledge about healthcare, possibilities of the GP and when a patient did not have a GP, the barriers preventing him or her from registering with a GP. The audio-recorded interviews were anonymized and transcribed verbatim by the researcher.

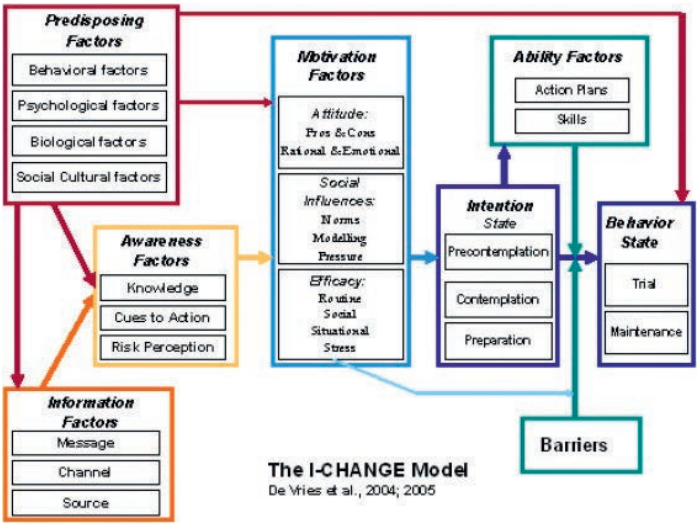

Figure 2 The I-Change model.37

Qualitative analysis

The transcribed interviews were analysed using the Atlas.ti (version 7) software programme for qualitative data analysis. First, a pre-set code tree based on the literature, the research question and the I-Change Model was prepared before starting the official coding process.[33] Segments of text (quotes) were labelled with a code from a pre-set code tree in a deductive approach to coding. However, if there was no code that suited the segment, a new code was developed using an inductive approach whereby passage content provides the basis for the code. The researcher P.V. first coded the interviews, after which the codes chosen and certain adjustments were discussed with a second researcher R.N.M. Following the initial coding of the interviews, some codes that defined the same concept were merged together and other codes were grouped into 'families' (main themes), which were then used for data analysis.

Results

Sample

A total of 44 patients were interviewed in two hospitals, with 20 interviews conducted in hospital 1 and 24 in hospital 2. The average age of interviewees was 35 years (range 19 months to 83 years). A parent of a young patient was interviewed, but the age of patients is shown here. There were more male patients (66%) than female patients (34%). Table 1 shows the characteristics of all patients. Further detailed information about each interview can be found in appendix B.

Table 1 Patient characteristics

Characteristics of the patients interviewed (n=44)										
Age in years	**n**	**Sex**		**Hospital**		**Migration background**		**Educational level***		
		Male n (%)	**Female n (%)**	**Hospital1 n**	**Hospital 2 n**	**Western n**	**Non- western n**	**Low n**	**Middle n**	**High n**
0–9	5	3 (60%)	2 (40%)	4	1	0	3	1	2	2
10–19	5	4 (80%)	1 (20%)	4	1	1	1	0	1	4
20–29	9	8 (89%)	1 (11%)	4	5	3	4	2	4	3
30–39	10	6 (60%)	4 (40%)	3	7	4	2	5	2	3
40–49	5	4 (80%)	1 (20%)	1	4	1	1	2	1	2
50–59	4	2 (50%)	2 (50%)	1	3	1	2	3	0	1
60–69	5	2 (40%)	3 (60%)	2	3	1	2	3†	1	0
>70	1	0 (0%)	1 (100%)	1	0	0	0	1	0	0
Total	44	29 (66%)	15 (34%)	20	24	11	15	17†	11	15

* The educational level is based on CBS criteria: https://www.cbs.nl/nl-nl/artikelen/nieuws/2013/40/onderwijsniveau-bevolking-gestegen/ onderwijsniveau †The educational level of one participant in the group 60–69 years is unknown.

Information and awareness factors

Information and awareness factors played an important role in a patient's decision to either go to hospital directly or to first go their own GP. There is currently a lack of patient information, and consequently patient awareness, regarding the appropriate type of care in the appropriate location, leading to patients making decisions that are often not fully considered.

Regarding the lack of information, the first problem facing patients in relation to many health problems is when to go to their GP and when to go to an ED. Even when patients have received information on healthcare procedures, they often cannot remember it or do not take the time to refer to it in a semi-acute medical situation. The result is that many patients are unaware that the optimal course of action is to first discuss a semi-acute medical situation with their own GP, followed by GP referral to the ED when necessary. Migrants and expats living in The Hague for short periods are particularly likely to be unaware of procedure, but Dutch patients are also often unaware of the correct procedure. Their first exposure to the correct procedure may be when they appear at the ED without a GP referral and are redirected to a GP at the Daytime GPC. Lack of clarity regarding where to go with a medical complaint is often due to patients being unaware of the competencies and facilities at their GP practice. For example, patients often think that it is only possible to get stitches in a hospital, whereas most GPs are perfectly able to do this as well. All quotes can be found in appendix C. See quotes 1 to 5.

A second aspect of this lack of information related to the GP's emergency telephone number. Many patients didn't know when a GP's emergency number should be used and had received no information on the subject. Many did not know whether their GP had an emergency number, mostly because they rarely call their GP practice. Some GP practices play a tape to a caller that explains when to use the emergency number, often including instructions such as "press one in life threatening situations". However, these descriptions may discourage patients when their complaint is not life-threatening and can push them towards going to the ED directly. See quotes 6 and 7.

A lack of awareness about the healthcare system and the costs incurred can have important consequences. Almost all patients are aware that they have to pay an annual personal contribution for hospital care, but they don't know the exact amount and when they have to pay. Patients with both high and low educational backgrounds did not fully understand the healthcare system. See quote 8.

Motivational factors

Numerous motivational factors stimulate patients to go to a hospital directly instead of going to their own GP during office hours. Most patients cited more than one reason.

One motivational factor was based on the perception that healthcare in a hospital is of higher quality. The presence of medical specialists and broader options for easily performed examinations such as X-rays were given as the main reasons for this perception. See quotes 9 to 11.

Other motivational factors often reported by patients were the shorter distance to a hospital in relation to their GP practice or the idea that they would be helped more quickly in a hospital. When patients think they will eventually be referred to a hospital, for example because they think they need an X-ray, they may consider it a waste of time and effort to arrange two journeys that include an initial visit to the GP. The motivation underlying going to the ED directly is to get help faster. See quotes 12 to 15.

The urgency of a complaint was an important motivational factor. Many people who self-referred experience anxiety and worry regarding their complaint and may think their symptoms too urgent for a GP. A sense of urgency was especially apparent in cases with trauma. A first reaction when someone has a cut, bruise or suspected fracture is to go to the ED. When patients go to a hospital, they expect to be seen in the ED and not by a GP in a Daytime GPC. See quotes 16 to 20.

Parents' concern for children was also a motivational factor. In our interview cohort, six of the nine children interviewed suffered trauma at school. The parents reported worry and a state of panic by the time they arrived at school. The combination of these feelings and the recommendations of teachers motivated them to visit a hospital. See quote 21.

Social factors and upbringing also influenced the choice to go directly to a hospital. In their country of origin some patients became accustomed to hospital visits when they were young and have not yet adapted to the concept of first visiting a GP. See quotes 22 and 23.

Suggestion by another person may also influence a patient. Due to the stress resulting from a medical problem, patients often ask for advice. Family members, friends, colleagues or a boss may sometimes encourage a patient to go to a hospital. When a trauma occurs at work, patients are inclined to listen to their boss because the visit to a doctor takes place during work time. See quotes 24 and 25.

Barriers

The barriers deterring patients from visiting their own GP rather than the hospital were mainly logistical. Of the 44 patients interviewed, six were not yet registered with a GP. All were first-generation migrants, aged between 25 and 43, and resident in The Netherlands for between two months and 17 years. An often mentioned reason for not having a GP was that they were young and healthy, and as such had little need or inclination to spend time searching for a GP. See quote 26.

Another barrier for patients was the distance to their GP at the time of the medical complaint, for example when a person was only in The Hague for a visit or for work. Four interviewees had GP's outside The Hague or in suburbs of The Hague. See quote 27.

Telephone accessibility of a GP was also mentioned as a barrier by some patients. A number of patients could not reach their GP due to a lunch break, house visits, a holiday or due to a GP maintaining strict times for phone contact. See quotes 28 to 31.

The thought of a long waiting list was also mentioned as a barrier to first visiting a GP. Patients want to see a doctor quickly and often think their GP will be unavailable. Many people who self-referred with a non-traumatic complaint called their own GP to make an appointment before going to hospital. Those patients, in this study all first-generation migrants, were unable to get an appointment on the same day and wanted to be seen at short notice. People

who self-referred often feel that the only way to see a doctor quickly is to go to a hospital. See quotes 32 to 34.

Ideas for the future

During the interviews, people who self-referred mentioned various ideas that might help them to make a more considered choice in future. According to patients, the biggest problem is information about the Dutch healthcare system. Interviewees had some suggestions for the dissemination of information, such as a letter with information, a poster at the GP practice, a television advertising campaign or commercials on YouTube. Some expats mentioned that information should be provided by the expat associations of which many are a member, so that those unfamiliar with healthcare organization in the Netherlands will also be reached. The information should describe the healthcare system and the 'GP first' procedure, the costs of healthcare and the options at a GP practice, together with some explicit examples of medical complaints and indications for using the emergency number. Many patients stated they did not take cost into account when deciding where to go because they consider health more important than money. However, if patients were made aware of the huge difference in costs of a visit to a GP or the ED, they might reconsider their choice next time. See quotes 35 to 38.

Discussion

In this qualitative study we aimed to identify the motives driving patients with a primary care request to go directly to an ED during daytime and the barriers deterring a visit to their own GP. A better understanding of this problem is essential to maintaining emergency care during daytime hours, and our results should help direct interventions that encourage the right care for the right patient in the right setting.

Strengths of the study included an interview topic list that covered the entire I-Change Model. Our findings therefore include insights concerning information and awareness factors. Furthermore, our preliminary analysis allowed us to conduct later interviews in a more in-depth manner. This is the first study based on a wide range of interviews conducted in Daytime GPCs in the Netherlands, and thus reveals the motives and barriers relevant to this relatively new service. The primary limitation of this study was the entirely voluntary nature of participation. Some patients, mainly of eastern European origin, declined our invitation to participate because they wanted to get back to work. In hospital 1 especially, GPs mentioned that they treat many Polish construction workers who did not participate in the study. Secondly, as this was an interview study patients might have given socially acceptable answers. We

attempted to limit this potential bias by emphasizing the anonymous character of the interviews and by avoiding judgmental questions.

Previous questionnaire or interview studies of people who self-referred at an ED focused only on motives, ignoring information factors. [22, 24, 25] We found that in most cases people have multiple reasons for going to a hospital rather than their GP. Patients' reasons are mainly based on misconceptions about their complaint, the GP and the hospital. A lack of information about the Dutch healthcare system also played an important role in these misconceptions. Other notable motives were convenience, perceived medical necessity and prompting by another person. People who self-referred tend to think that their complaint is urgent and that they are justified in going to the hospital directly, concurrently avoiding the trouble of arranging transport to their GP. Suggestions regarding a hospital visit are often due to a lack of familiarity with the transition of emergency departments over the past decennia from a 'first aid post for accidents' to specialized hospital departments.[35] In the past many patients grew accustomed to 'accident departments' and this popular concept is still noticeable in many interviews.

While interviewees sometimes mentioned the perceived poor telephone accessibility of GPs as a barrier, due to wide variation we cannot safely conclude that poor accessibility results in more ED self-referral. Nonetheless, a relationship between GP accessibility and the number of people who self-referred has been described in earlier literature.[28, 29] Another factor that discourages patients from first consulting their GP is a long waiting period for an appointment. However, this problem was only mentioned in our study by first-generation migrants, a finding in line with a study by Scheppers et al. and a study by Keizer et al. who suggested that some migrants are experience problems accessing their own GP and are less willing to wait. [36, 37] Therefore, more easily understandable information should be provided for migrants, explaining both the urgency of complaints and the Dutch healthcare system.

The wide variety of motives and barriers among people who self-referred attending hospital indicates that there is no straightforward solution to the high level of self-referral. Additionally, as patients reported that a variety of factors contributed to their decision, the same patient may require several different interventions. Providing clearer information through a variety of channels might influence the factors that contribute to patient self-referral to an ED, thereby improving patient knowledge and avoiding misconceptions regarding their own complaints and GP competencies. Better information about a GP's emergency telephone accessibility and providing examples of the types of emergencies that can be handled by a GP might help improve the image of

GP accessibility. The Easy, Attractive, Social and Timely (EAST) framework is a model for applying behavioural insights to encourage specific behaviour. This model could be used to define more interventions and provide more information. Information that is easy to understand, attracts attention, uses the power of social networks and prompts people at a time they are more likely to be receptive, might help encourage patients to visit their own GP before visiting a hospital. [38] Information should be made available to the entire population, but to reach specific target groups the source and channels of information should be focused on migrants, expats and males aged between 20 and 40.

It is still not entirely clear whether GPs in The Hague themselves play a significant role in the problem of ED self-referral. Our recommendation is that the characteristics of GP practices should be further investigated to identify possible weaknesses.

Conclusions

Our findings show that the most important motives behind ED self-referral during office hours were convenience, perceived medical necessity and the prompting of another person. Barriers were mainly logistical, including not being registered with a GP, having a GP elsewhere, waiting times for appointments and the poor availability or telephone accessibility of the GP, including confusion regarding the purpose of an emergency telephone number. We also gained insight into information and awareness factors that influence motivation factors. There is no clear solution to reducing the number of people who self-referred. However, better provision of information could be a first step in increasing health literacy and reducing misconceptions. By setting up interventions for specific target groups such as migrants, expats and young males, we will eventually approach our goal of providing 'the right care to the right patient in the right setting'.

Acknowledgements

This study was sponsored by Hadoks (a GP cooperation in The Hague, the Netherlands). Hadoks did not play any part in the design, analysis or in the decision to publish the results of this study.

References

1. Moskop JC, Sklar DP, Geiderman JM, Schears RM, Bookman KJ. Emergency department crowding, part 1--concept, causes, and moral consequences. Annals of emergency medicine. 2009;53(5):605-11.
2. Sun BC, Hsia RY, Weiss RE, Zingmond D, Liang LJ, Han W, et al. Effect of emergency department crowding on outcomes of admitted patients. Ann Emerg Med. 2013;61(6):605-11 e6.
3. Gaskeer M.S. ea. Drukte op de SEH vergt integrale aanpak. . Medisch contact. 2018.
4. (NZa) NZ. Monitor acute zorg 2018. https://pucoverheidnl/nza/doc/PUC_260889_22/1/. 2018.
5. Starfield B, editor Is strong primary care good for health outcomes. The future of primary care: Papers for a symposium held on 13th September 1995; 1996: Office of Health Economics.
6. Kulu-Glasgow I, Delnoij D, de Bakker D. Self-referral in a gatekeeping system: patients' reasons for skipping the general-practitioner. Health policy. 1998;45(3):221-38.
7. Van der Maas J RM, Smits M, van Boven K,, P. G. Spoedzorg in de huisartsenpraktijk: onderzoek naar de contactfrequentie, patiënten zorgkenmerken. . Huisarts en Wetenschap 2018; 61: 36-43. 2018.
8. van der Linden MC, Lindeboom R, van der Linden N, van den Brand CL, Lam RC, Lucas C, et al. Self-referring patients at the emergency department: appropriateness of ED use and motives for self-referral. International journal of emergency medicine. 2014;7(1):28.
9. Reitsma-van Rooijen M, Brabers A, Jong Jd. Selectie aan de poort: onterechte zelfverwijzers op de SEH terugdringen. 2013.
10. Giesen P, Franssen E, Mokkink H, van den Bosch W, van Vugt A, Grol R. Patients either contacting a general practice cooperative or accident and emergency department out of hours: a comparison. Emergency medicine journal : EMJ. 2006;23(9):731-4.
11. Kraaijvanger N, Rijpsma D, van Leeuwen H, van Dijk N, Edwards M. Self-referrals in a Dutch Emergency Department: how appropriate are they? Eur J Emerg Med. 2016;23(3):194-202.
12. Zorgautoriteit N. Marktscan acute zorg 2017. 2017.
13. Giesen P SM, Huibers L, Grol R, Wensing M. . Quality of after-hours primary care in the Netherlands: a narrative review. . Annals of Internal Medicine 2011; 155: 108-113. 2011.
14. Smits M RM, Keizer E, Wensing M, Westert G, Giesen P. . The development and performance of after-hours primary care in the Netherlands: a narrative review. Annals of Internal Medicine 2017; 166: 737-742. 2017.
15. Gaakeer MI, Van den Brand CL, Veugelers R, Patka P. Inventarisatie van SEH-bezoeken en zelfverwijzers. Nederlands Tijdschrift Voor Geneeskunde. 2014;158(A7128).
16. Gaakeer MI, Van den Brand CL, Gips E, van Lieshout JM, Huijsman R, Vleugelers R, et al. Landelijke ontwikkelingen in de Nederlandse SEH's: aantallen en herkomst van patiënten in de periode 2012-2015. Nederlands Tijdschrift Voor Geneeskunde. 2016;160(D970).

17. van der Linden MC, Lindeboom R, van der Linden N, van den Brand CL, Lam RC, Lucas C, et al. Self-referring patients at the emergency department: appropriateness of ED use and motives for self-referral. Int J Emerg Med. 2014;7:28.
18. Nederlandse Zorgautoriteit. Open data van de Nederlandse Zorgautoriteit 2018 [Available from: http://www.opendisdata.nl/
19. SMASH Huisartsenpost Den Haag. [Available from: https://www.smashaaglanden.nl/.
20. Rijksoverheid. Eigen risico zorgverzekering.
21. Rutten M, Vrielink F, Smits M, Giesen P. Patient and care characteristics of self-referrals treated by the general practitioner cooperative at emergency-care-access-points in the Netherlands. BMC family practice. 2017;18(1):62.
22. de Valk J, Taal EM, Nijhoff MS, Harms MH, Lieshout EM, Patka P, et al. Self-referred patients at the Emergency Department: patient characteristics, motivations, and willingness to make a copayment. Int J Emerg Med. 2014;7:30.
23. Rutten M, Vrielink F, Giesen P. Zelfmelders op de huisartsenpost. Huisarts en Wetenschap. 2013;56(11):558-62.
24. Rassin M, Nasie A, Bechor Y, Weiss G, Silner D. The characteristics of self-referrals to ER for non-urgent conditions and comparison of urgency evaluation between patients and nurses. Accid Emerg Nurs. 2006;14(1):20-6.
25. Kraaijvanger N, Rijpsma D, van Leeuwen H, Edwards M. Self-referrals in the emergency department: reasons why patients attend the emergency department without consulting a general practitioner first-a questionnaire study. Int J Emerg Med. 2015;8(1):46.
26. Andrews H, Kass L. Non-urgent use of emergency departments: populations most likely to overestimate illness severity. Intern Emerg Med. 2018;13(6):893-900.
27. Ragin DF, Hwang U, Cydulka RK, Holson D, Haley LL, Jr., Richards CF, et al. Reasons for using the emergency department: results of the EMPATH Study. Acad Emerg Med. 2005;12(12):1158-66.
28. Smits M, Peters Y, Broers S, Keizer E, Wensing M, Giesen P. Association between general practice characteristics and use of out-of-hours GP cooperatives. BMC family practice. 2015;16:52.
29. Baker R, Bankart MJ, Rashid A, Banerjee J, Conroy S, Habiba M, et al. Characteristics of general practices associated with emergency-department attendance rates: a cross-sectional study. BMJ Qual Saf. 2011;20(11):953-8.
30. Agarwal S, Banerjee J, Baker R, Conroy S, Hsu R, Rashid A, et al. Potentially avoidable emergency department attendance: interview study of patients' reasons for attendance. Emerg Med J. 2012;29(12):e3.
31. Nederlandse Zorgautoriteit. Prestatie- en tariefbeschikking Huisartsenzorg en multidisciplinaire zorg 2018. 2018.
32. Baarda DB, De Goede MPM, Teunissen J. Basisboek Kwalitatief Onderzoek. Groningen/Houten: Wolters-Noordhoff; 2005.
33. De Vries H, Mudd AN, Dijkstra A. The attitude-social influence-efficacy model applied to the prediction of motivational transitions in the process of smoking cessation. In: Norman P, Abraham C, Conner M, editors. Understanding and Changing Health Behaviour: From Health Beliefs to Self-regulation. Amsterdam: Harwood Academic; 2000. p. 165-87.
34. Ketterer F, Symons L, Lambrechts M, Mairiaux P, Godderis L, Peremans L, et al. What factors determine Belgian general practitioners' approaches to detecting and managing substance abuse? A qualitative study based on the I-Change Model. BMC Fam Pract. 2014;15(119).

35. de Haan P, Breuer J. Van EHBO naar spoedeisende hulpafdeling. WCS nieuws. 2009;25(3):30-2.
36. Scheppers E, van Dongen E, Dekker J, Geertzen J, Dekker J. Potential barriers to the use of health services among ethnic minorities: a review. Fam Pract. 2006;23(3):325-48.
37. Keizer E BP, Giesen P, Wensing M, Atsma F, Smits M, van den Muijsenbergh, M. Migrants' motives and expectations for contacting out-of-hours primary care: a survey study. . BMC Family Practice 2017; 18: 92. 2017.
38. Hallsworth M, Halpern D. EAST Four simple ways to apply behavioural insights. NESTA. 2014.

Additional material Chapter 4

Appendix A: interview topic list

Topics	Examples of questions
Personal information	
Age	– What is your age?
Cultural background?	– Where are you born? – Do you have a religion? – What did you do with such a medical complaint when you were young?
Education and work	– What is the highest education you finished? – What is the highest education you did? – Do you have a job?
Living situation	– With whom do you live? – In which neighbourhood do you live?
Experienced health	– How do you describe your own health? – Do you go often to the hospital/GP?
Today's visit	
Complaint	– What is the complaint with which you came to the hospital today?
Motivation hospital visit	– Why did you come to the hospital directly today? – What are benefits of going to the hospital directly? – Does someone motivate you to go to the hospital directly? – Do you take money into account in this decision? – What is for you the easiest option and why?
Barriers own GP	– How do you describe the relationship with your own GP? – Can you discuss everything with your GP? – How long are you already a patient with your GP? – Is your GP in the same living district? – How is the accessibility of your GP? – Does your GP have an emergency line? – Why didn't you go to the GP today? – What are disadvantages of going to the GP?
Predisposing factors	– Does anxiety plays a role in your decision for going to the hospital directly? – What do you think is normal to do in such a situation?
Awareness	– Where do you think you could get the best care for this complaint? – What do you think is important with the care fort his complaint? – Do you think your GP could handle this complaint? – What are the consequences of your choice? – What do you think is more expensive? ED or GP?
Information	– What do you know about the organization of the health care in The Netherlands? – Do you understand the health insurance and when you have to pay the deductible amount? – Do you use any information in the decision about where to go to?
Intention	– What would you do next time with this complaint? – What needs to change for you to go to the GP next time with this complaint?
Capacity	– What would help to make a good decision next time about where to go to with your complaint? – Do you have any tips for the organization of health care?

Appendix B: detailed information about each interview

Interviewed patients								
	Hospital	Age range in years	Education level	Education level parent	Cultural background	Cultural background parents	Complaint	GP
P1	1	0-9		middle	Dutch	Dutch, Curaçao	injury	Yes
P2	1	0-9		high	Dutch		musculoskeletal	Yes
P3	1	0-9		high	Dutch		musculoskeletal	Yes
P4	2	40-49	high		Dutch		pain	Yes
P5	2	20-29	low		Romania		allergic	No
P6	2	10-19		high	Dutch		musculoskeletal	Yes
P7	1	10-19		high	Dutch	Curaçao	musculoskeletal	Yes
P8	1	60-69	low		Dutch		musculoskeletal	Yes
P9	1	50-59	low		Portugese		ear, nose, mouth, throat	Yes
P10	1	30-39	low		Romania		eyes	Yes
P11	1	20-29	middle		Dutch		injury	Yes
P12	1	10-19		high	Dutch		injury	Yes
P13	1	0-9		middle	Dutch	Marocco, Dutch	musculoskeletal	Yes
P14	2	20-29	middle		Hungary		backpain	No
P15	2	40-49	low		Iran		injury	Yes
P16	2	30-39	low		Curacao		gastrointestinal	No
P17	2	20-29	high		Spain		ear, nose, mouth, throat	No
P18	2	30-39	low		Dutch		backpain	Yes
P19	2	50-59	low		Aruba		not feeling well	Yes
P20	1	30-39	high		Dutch		eyes	Yes
P21	1	40-49	middle		England		injury	No
P22	1	20-29	middle		Iraq		sleeping disorder	Yes
P23	1	20-29	high		Curacao		gastrointestinal	Yes
P24	1	30-39	low		Hungary		musculoskeletal	No
P25	1	20-29	high		Dutch	England	musculoskeletal	Yes
P26	1	10-19		middle	Dutch		musculoskeletal	Yes
P27	1	20-29	middle		Dutch	Marocco, Egypt	injury	Yes
P28	1	80-89	low		Dutch		musculoskeletal	Yes
P29	1	60-69	low		Dutch		musculoskeletal	Yes
P30	2	50-59	low		Algerije		backpain	Yes
P31	2	40-49	high		Dutch		injury	Yes
P32	2	30-39	high		Dutch		neurological	Yes

Appendix B: Continued

Interviewed patients								
	Hospital	Age range in years	Education level	Education level parent	Cultural background	Cultural background parents	Complaint	GP
P33	2	60-69	middle		Malta		musculoskeletal	Yes
P34	2	40-49	low		Dutch		musculoskeletal	Yes
P35	2	30-39	middle		Dutch		musculoskeletal	Yes
P36	2	50-59	high		Dutch		injury	Yes
P37	2	30-39	high		France		injury	Yes
P38	2	30-39	middle		Dutch	Suriname	musculoskeletal	Yes
P39	2	20-29	low		Dutch		cardiologic	Yes
P40	2	20-29	high		Curacao		injury	Yes
P41	2	60-69	low		Turkey		musculoskeletal	Yes
P42	2	0-9		low	Dutch	Turkey	musculoskeletal	Yes
P43	2	30-39	low		Portugal		eyes	Yes
P44	2	60-69	unknown		Suriname		not feeling well	Yes

Appendix C: Quotes

The results are presented in the form of highlighted factors within the I-Change Model, together with a number of direct quotes from the interviews. After each quote information about the interview is written down (patient interview number and hospital number).

Information and awareness factors

Lack of information about the choice when to go to their GP and when to go to an ED

Q1: "I am wondering if there has been an information campaign for this, because I didn't notice. Yes, when you go for the first time, they will confront you like: 'hey, you don't belong here, you should go to your general practitioner'. So, that's more through the experience that you know. No, I've never received any campaign or information." P31, hospital 2.

Q2: "Interviewer: And did you call the GP?
Patient: No, I wasn't aware of the procedure. Now I know you call the GP first. Now I know."
P33, hospital 2.

Q3: "Maybe yes, maybe. Because I really didn't know. I really didn't know that if you need an X-ray nowadays, if you break something, that you must make the X-ray through the GP. I wasn't aware of that. So that's really weird." P34, hospital 2.

Q4: "I thought, if I need stitches the GP won't do that." P36, hospital 2.

Q5: "The GP is for me by appointment. At least, that's in my head. I'm used to that. So if you register something in advance with a GP, you can go there, but not with these kinds of things." P31, hospital 2.

Lack of information related to the GP's emergency telephone number
Q6: "[…] because I actually have no idea what they mean with the GP's emergency telephone number" P3, hospital 1, mother of the patient.
Q7: "No, that doesn't make sense, you can call the doctor, but that's always between certain times. They do have an emergency telephone number, but in this case this isn't emergency for the GP, because then they say you have to go to the hospital. So yes, you will end up here anyway." P3, hospital 1, mother of the patient.
Lack of awareness about the healthcare system and the costs incurred
Q8: "Well, actually not completely. It is a vague concept. I do know I have a kind of basic insurance." P40, hospital 2.

Motivational factors
Perception that healthcare in a hospital is of higher quality
Q9: "The reason we came here is because I thought by myself, if you go to the GP, I assume on X-ray needs to be done. There is no point going to the GP first. You might as well go to the hospital first." P25, hospital 1.
Q10: "Yes, and my mother said that this doctor could do more. Because the other doctor [i.e. the GP] doesn't do that much." P42, hospital 2.
Q11: "Yes, because if I end up here, they always treat me well, so I feel always good about the treatment I receive. […] always there is good testing. That I, how do you say, happy go home, pleased go home. With those checks and stuff, that's why I always come here." P16, hospital 2.
Shorter distance to a hospital or helped more quickly in a hospital
Q12: "Because this [i.e. the hospital] was the final destination of the bus, I thought there I am." P20, hospital 1.
Q13: "Then I started hopping, but I couldn't. It took so long. Then we came directly here [i.e. the hospital] because the GP was far, far away." P42, hospital 2.
Q14: "Especially the transport. First calling the GP and then go there for a referral letter for the radiology and then again a transport. And now, this transport hardly went well…" P29, hospital 1.
Q15: "Well, I guess that they (i.e. the GP and his/her assistant) would send me to the ED. That's what I think." P38, hospital 2.
The urgency of a complaint
Q16: "Well, this is an emergency[…] because I couldn't pick up my camera and I couldn't move my hand this morning, I thought well better safe than sorry. I go straight to the ED." P33, hospital 2.
Q17: "I thought that if that would be too much time, maybe my wound would be worse at that time. Well, I thought it was an emergency." P37, hospital 2.

Q18: "[…] for such a wound I would think that it's urgent… I wouldn't think about a GP or something.." P1, hospital 1, father of the patient.
Q19: ''Yes, you do not think about that, I had something like as soon as possible to the hospital. There we will see further…" P7, hospital 1, father from the patient.
Q20: "Yes, I thought this is serious. I immediately went to the ED and then they sent me here." P27, hospital 1.

Parents' concern for children
Q21: "Well, in this case because I actually didn't know where to go to and because they (i.e. people from the school of the patient) said that we had to go to the ED. And I was also upset about everything that happened. So then I thought let's just go there." P12, hospital 1, mother of the patient.
Social factors and upbringing
Q22: "In Aruba I always go to the hospital. It could be something really small, still I go to the ED. Because you know, you will get treatment, medicines etc. They don't need to check everything first, they just treat everything quick." P19, hospital 2.
Q23: "Back in the days, when you twisted your ankle and it was really swollen, you went to the first aid and not to your GP. So yes, and I never go there, so I actually thought it still was the same [laughs]. But apparently not." P34, hospital 2.
Suggestion by another person
Q24: "Well, at that moment I just called my husband and explained the situation. He also thought they (i.e. the anklets) were torn and then automatically, ED." P38, hospital 2.
Q25: "So my boss said go to the hospital. I work for him, so I do what he tells me. I won't jump in a hole if he says to do so, but he has definitely experienced such a situation before." P43, hospital 2.

<u>Barriers</u>
Not yet registered with a GP
Q26: "I didn't have time and I didn't need it until now. O, I didn't think I would need it very soon and as I am working a lot, because I work in 2 shifts. So due to that I didn't have time to go to one." P5, hospital 2.
The distance to their GP at the time of the medical complaint
Q27: "I didn't go to my GP because now it happened here. Maybe if it happened close to my house (i.e. residence of patient) I would go to my family doctor, but I wasn't there." P10, hospital 1.
Telephone accessibility of a GP
Q28: ''Yes, I initially called the GP and because they had a lunch break till 01:00 pm I thought I drive straight on." P26, hospital 1, father of the paitent.
Q29: "And yes, so, I really didn't know. I thought it is 01:00 pm, well, at that moment it was 12:30 pm. I can't reach the GP now. So, I thought, I don't know, I just go to the emergency department." P13, hospital 1, mother of the patient.

Q30: "Yes, they were going to do house visits. At 2:30pm they are gone, so you can't pass by anymore. Well, that's the actual reason we are here." P6, hospital 2, mother of the patient.
Q31: "Well, actually that is a problem with my GP, because you can only call till 11:00am for an appointment, to make an appointment. Anyway, they are accessible till 11:00." P13, hospital 1, mother of the patient.

The thought of a long waiting list

Q32: "We got up this morning and we go straight to the hospital. Then I think, I won't go to the GP First?! That's such nonsense. Imagine, you are at home and your arm breaks. Well it's just a fracture of your arm, you won't call the ambulance for that. But then you call your GP and say: 'listen, I think I broke my arm'. Then your GP will say: 'Okay, could you come in 2 days?' Then I think by myself, this doesn't make sense." P8, hospital 1.
Q33: "I was there (i.e. at the GP's office), I was there this morning, but she is busy. I got an appointment for next Thursday (i.e. three days later) because she is busy. But I am in so much pain, I have such a strange feeling, I don't feel well. That's why I came here, because maybe it will get worse… I don't know, I just want a check-up." P23, hospital 1.
Q34: "I called, they said or wait till next week or wait until tomorrow afternoon. Then you can call again. I said I can't do that. If I don't have pain, just for a regular check, it's no problem to wait 2 weeks. But if you have so much pain…and I would like to work again tomorrow." P30, hospital 2.

<u>Ideas for the future</u>

Q35: "Well, that you just have an advertising campaign from the first aid, call the GP first. The word first aid, that you think, help." P36, hospital 2.
Q36: "I think, for example, to contact someone, like the international expat association. Anything to do with expats. To tell them that however we do have an emergency, see your GP first. The GP makes the appointment and then you could go to the hospital. Don't go to the hospital and waste their time with a stupid complaint." P33, hospital 2.
Q37: "I think just a television commercial or YouTube advertisement. They're often complete nonsense. So if you see this, you might think first to the GP." P40, hospital 2.
Q38: "Interviewer: […] And would you perhaps make another choice in the future, now that you know this? Patient: Yes. I: What would you do? P: I would just call the GP. I: Why? P: Because of the costs." P38, hospital 2.

Chapter 5

Effect of COVID-19 on Health System Integration in the Netherlands: a mixed-methods study

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Journal of the American College of Emergency Physicians Open – 2021 May
DOI: 10.1002/emp2.12433

Abstract

Objectives Overcrowding in acute care services gives rise to major problems, such as reduced accessibility and delay in treatment. In order to be able to continue providing high-quality healthcare, it is important that organizations are well integrated at all organizational levels. The objective of this study was to to gain an understanding in which extent cooperation within an urban acute care network in the Netherlands (The Hague) improved due to the COVID-19 crisis.

Methods Exploratory mixed-methods questionnaire and qualitative interview study. Semi-structured interviews with stakeholders in the acute care network at micro (n=10), meso (n=9) and macro (n=3) levels of organization. Thematic analysis took place along the lines of the six dimensions of the Rainbow Model of Integrated Care (RMIC).

Results In this study we identified themes that may act as barriers or facilitators to cooperation: communication, interaction, trust, leadership, interests, distribution of care, and funding. During the crisis many facilitators were identified at clinical, professional and system level such as clear agreements about work processes, trust in each other's work, and different stakeholders growing closer together. However, at an organizational and communicative level there were many barriers such as interference in each other's work and a lack of clear policies.

Conclusion The driving force behind all changes in integration of acute care organizations in an urban context during the COVID-19 crisis seemed to be a great sense of urgency to cooperate in the shared interest of providing the best patient care. We recommend shifting the post-crisis focus from overcoming the crisis to overcoming cooperative challenges.

Introduction

Background

The overcrowding of acute care services gives rise to major problems in healthcare due to many factors. [1-3] One factor is the growing influx of patients combined with a lack of healthcare personnel causes reduced accessibility and delays in treatment, often resulting in suboptimal quality of care, an increased workload for healthcare professionals, and a higher complication rate. [1, 2, 4] Another factor is the large number of healthcare organizations leads to fragmentation. A study found that fragmentation was associated with increased costs of care, a lower chance of being subjected to clinical best practice care, and higher rates of preventable (re-) hospitalizations. [5] The coronavirus (COVID-19) pandemic poses a threat to already overstretched acute care services worldwide. Organizations have been forced to cooperate and restructure quickly, to deal with the growing number of patients with threatening medical conditions, the lack of personal protective equipment (PPE), and staff loss due to disease. [6, 7]

Across the Netherlands, the acute care network involves many different organizations, including Emergency Departments (EDs), General Practice Cooperatives (GPCs), ambulance services, acute mental health services, and home care and nursing home organizations. Dutch citizens are required to have a basic health insurance package to guarantee the quality of care, leading to insurance companies having substantial influence the network's organization and function. [8] Due to the large number of organizations involved, there are multiple entrance and exit routes for patients in the acute care network. The GP acts as a gatekeeper at the primary care level, deciding whether to refer a patient to secondary healthcare, resulting in lower healthcare costs for the society as a whole. [9] With a referral from their GP, patients are able to utilize secondary healthcare and are eligible for reimbursement.[10] Patients with medical problems typically visit their own GP during office hours, even when problems are perceived as urgent or threatening. [11] After-hours patients with an acute care request can report to an GPC. When a request is considered urgent, they can self-refer directly to the ED at all hours, or be transported to the ED by ambulance following a GP visit or as a result of calling the national emergency telephone number 112. [12] After receiving assistance at an ED, a patient can be hospitalized, referred to a nursing home, receive care at home if necessary, or be referred back home. [13] These multiple entrance and exit routes increases the pressure on the acute care network. [14, 15] In the region of The Hague, the third largest city in the Netherlands with a population of around 800,000 people, the large number of healthcare providers involved additionally increases the challenges of effective cooperation by fragmentation caused by healthcare

providers working independently and with too little communication. [15, 16] Two general hospitals coexist in the city, both with a GPC in close proximity to their ED. A large GP partnership coordinates the two GPCs. [17, 18] Among the multitude of home care and nursing home organizations in the area, five organizations are the largest players, including many elderly care physicians and nurses. Two insurance companies have substantial market share in urban The Hague.

Importance

Cooperation and integration are presumed to be the key to successfully overcoming the practical, organizational, and medical challenges we have outlined here. [19] Effective communication and coordination between all stakeholders at different levels of an organizational structure is crucial to providing high quality healthcare. [20, 21] The Rainbow Model of Integrated Care (RMIC) by Valentijn et al. was developed as a conceptual framework to visualize integrated care from six interrelated dimensions: clinical, professional, organizational, systems, functional, and normative integration. [20] These dimensions of integration play complementary roles on the micro- (clinical integration), meso- (professional- and organizational integration) and macrolevels (system integration). To achieve connectivity and to add overall value, functional and normative integration should ensure the linking of the micro, meso and macro levels with the system. Functional integration includes planning, human resource-, information- and financial-management. Normative integration includes a shared mission, vision and culture between different individuals, organizations and regulatory bodies (figure 1). [20] The dimension of normative integration can be further explored by using the ''five lenses on cooperation'' model by J. Bell *et al.* [22] This model offers a comprehensive view of methods used to manage cooperation successfully, based on the premise that the best cooperation requires an integral approach with five balanced building blocks: shared ambition, mutual gains, relationship dynamics, organization dynamics, and process management.

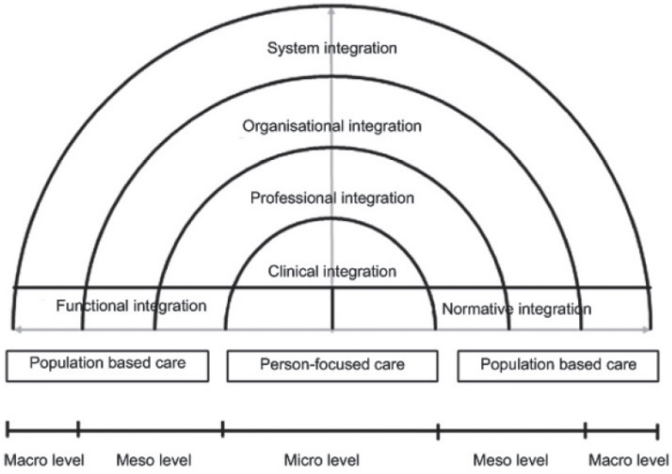


Figure 1. Rainbow model for integrated care (RMIC) *(no copyright restrictions)*

Goals of This Investigation

The COVID-19 crisis confronted the acute care network with a challenge requiring fragmentation to be set aside. The aim of this exploratory mixed-methods study was to gain an understanding of the extent to which cooperation of stakeholders in our urban acute care network improved due to the COVID-19 crisis by answering three questions: 1) What changes in cooperation took place? 2) What were the facilitators and barriers for cooperation? 3) Which changes in cooperation are desirable in the future in order to improve the accessibility of acute healthcare?

Methods

Study design and selection of participants

We performed an exploratory mixed-methods study using questionnaires and semi-structured interviews to gain an overview of perspectives from stakeholders in our acute care network. The stakeholders were recruited using a snowball sampling strategy. [23] The first four important, visible stakeholders were selected by the research team (a GP, a manager of the GP Partnership, and a specialist from hospitals 1 and 2) and asked to name other important cooperation partners. This procedure went on until no new names were mentioned. The final research group consisted of 22 stakeholders: ten clinicians, four managers, five administrators and three insurance company representatives (Table 1). We added two additional parties: the Dutch Red Cross and the regional medical relief organization (in Dutch GHOR), which coordinates the regional acute care network during crises. Both were only asked about their experiences as an external party, and are therefore not counted as stakeholders.

Table 1. Stakeholders involved in the acute care network in The Hague

Level	Group	Abbreviation	N=22
Micro: Clinical integration			
	General Practitioner	GP	1
	Specialists Hospital 1	SpH1	2
	Specialists Hospital 2	SpH2	3
	Residents (specialist registrar) H1 and H2	ResH1/ResH2	2
	Elderly care physicians	ECP	1
	Nurse Practitioner	NP	1
Meso: Professional integration			
	Manager GP Partnership	ManGP	1
	Manager Ambulance Services	ManAS	1
	Manager Home care & nursing home (Organization 1)	ManNH	1
	Manager Emergency Mental Health Services	ManMHS	1
Meso: Organizational integration			
	Administrator GP Partnership	AdmGP	1
	Administrators Home care & nursing home: (Organization 1 and 2)	AdmNH1/ AdmNH2	2
	Administrator Hospital 1	AdmH1	1
	Administrator Hospital 2	AdmH2	1
Macro: System integration			
	Insurers: Organization 1 and 2	Ins1/Ins2	3

Questionnaire

The addition of a questionnaire to the qualitative study is done to support the qualitative analysis. Approximately one week before their interview, the 22 stakeholders received a digital questionnaire based on topics of the validated RMIC Measurement Tool [24] (see Appendix I) to provide a baseline overview of which changes in integration took place during the COVID-19 crisis, secondary to the qualitative research. The questionnaire consisted of 23 questions, with answer choices corresponding to different stages of integration: completely segregated (score 1), aligned (2), coordinated (3), and completely integrated (4). Each question was asked three times, in the context of to three different situations: the situation *before* the COVID-19 crisis, the situation *during* the COVID-19 crisis, and the *preferred* situation. The questionnaire data were generated using a Likert Scale method and reported as mean, median, and 95% confidence interval scores of the median, calculated per RMIC dimension, for each of the three different situations. The explanations provided in the questionnaire were also used as a basis for further discussion during the interviews. Statistical analysis was performed with SPSS-version 21.0 (IBM Corp., 2012, Armonk, NY).

Interviews

19 semi-structured interviews were conducted using a topic list to standardize interviews between July and September 2020 with a total of 22 stakeholders (16 individually stakeholders, six in pairs) by RNM, supported by researcher MCB. Before the first interview, both researchers were trained by the entire research team. After informed consent was given, audio recordings ranging from 35 to 85 minutes were made. The topic list distilled from The five lenses on cooperation model [22] and chosen following consultation with a change management expert, consisted of two general topics, followed by nine connected key topics of cooperation: shared vision and ambition, shared interests, trust, affective relations, informal culture, leadership roles, accountability and feedback, transparency, and friction (Appendix II). Stakeholders were additionally asked about their dreams for the future concerning cooperation in the acute care network. The interviews were transcribed verbatim by MCB following participant consent. RNM then organized a feedback event on 16 September 2020 at which all participants were able to share preliminary results of the study. The transcribed interviews were coded and labelled by MCB, discussed by HMMV, and analysed using the Atlas.ti (version 7) software program for qualitative data analysis. All codes were regrouped into subgroups based on the interview topic list and rearranged into six themes (Table 2), per integration level of the RMIC, using a deductive approach. Some new themes were developed, distribution of care and funding. For each of the themes we determined whether it acted as a barrier, a facilitator, at each level of integration of the RMIC. The experiences of two external parties were also added to the dataset, but no full interview was conducted.

Table 2. Rearrangement of themes for analysis

Interview topics	Themes
Shared vision and ambition	Perspectives on the future
Shared interests	Interests
Trust, transparency, friction	Trust
Affective relations	Interaction
Informal culture, accountability and feedback	Communication
Leadership roles	Leadership
New	Distribution of care
New	Funding

The questionnaires and interviews were pseudonymized. The study was registered and approved by the medical research ethics committee of Leiden University Medical Centre (LUMC).

Results

Questionnaire

Following exclusion of five questionnaires not completed within the allotted time before the interview and three questionnaires from the insurers who were not able to answer the questions about clinical practice due to a lack of insight into the entire network, we included 14 questionnaires in our study to provide a baseline overview. Table 3 shows the results of our statistical analysis on the exploratory questionnaire data. The mean during-COVID scores were higher than the pre-COVID scores in five of the six integration levels, though none of the differences were statistically significant. Along all six integration levels, both pre- and during-COVID integration scores were lower than the scores describing the preferred situation.

Table 3. Questionnaire results The scores corresponded with different stages of integration where 1 means completely segregated, 2 aligned, 3 coordinated, and 4 completely integrated.

Level of Integration	**Before COVID** (n=14)	**During COVID** (n=14)	**Preferred situation** (n=14)
Clinical integration; Mean (±SD)	2.1 (0.28)	2.4 (0.30)	3.6 (0.32)
Median 95% CI Lower-Upper bound	2.20 1.9-2.3	2.60 2.2-2.7	3.80 3.4-3.9
Professional integration; Mean (±SD)	1.9 (0.79)	2.4 (0.78)	3.8 (0.21)
Median 95% CI Lower-Upper bound	1.75 1.3-2.5	2.25 1.8-3.0	3.75 3.6-4.0
Organizational integration; Mean (±SD)	1.8 (0.37)	2.1 (0.44)	3.6 (0.30)
Median 95% CI Lower-Upper bound	1.75 1.5-2.1	2.00 1.8-2.4	3.60 3.4-3.8
System integration; Mean (±SD)	1.9 (0.33)	2.1 (0.42)	3.4 (0.34)
Median 95% CI Lower-Upper bound	2.00 1.7-2.2	2.00 1.7-2.4	3.33 3.2-3.7
Functional integration; Mean (±SD	1.3 (0.37)	1.4 (0.49)	3.9 (0.17)
Median 95% CI Lower-Upper bound	1.00 1.0-1.6	1.00 1.0-1.8	4.00 3.8-4.0
Normative integration; Mean (±SD)	2.1 (0.47)	2.6 (0.46)	3.9 (0.24)
Median 95% CI Lower-Upper bound	2.33 1.7-2.5	2.67 2.2-2.9	4.00 3.7-4.0

Interviews

All interview results are substantiated with quotes of the stakeholders, are found in Supplement I, and indicated in the following text by Q1 through Q56. Some quotes are also shown in the result section.

Research question 1: What changes in cooperation took place during the crisis?
The driving force behind all changes in cooperation seemed to be a great sense of urgency during the crisis and therefore there was a need for increased contact and clear policies (Q1). The managers of the GP partnership decided to concentrate all COVID primary care in one GPC located at hospital 1, thereby sending all non-COVID primary care to the GPC at hospital 2. Having all COVID-related primary care concentrated in one location also facilitated cooperation with the ED (Q2). Hospital 1 formed a team of Pulmonology and Internal Medicine specialists and residents who took turns with shifts at the GPC, bringing specialized care into the COVID GPC. This type of integrated care in which GPs treating patients in primary care can consult specialists for advice is called Primary Care Plus (PC+). [25] PC+ was already implemented in daily primary care, but received a large boost in the acute setting at the COVID GPC, which helped reduce overcrowding in the ED by keeping patients in primary care. An unexpected benefit was the opportunity for various doctors to observe each other's work, leading to a growing appreciation, and trust (Q3). Another helpful intervention was the placement of an elderly care physician at the ED to facilitate outflow (Q4). Furthermore, the system which gives insight into the available capacity at nursing home organizations, called "POINT", was improved to facilitated patient outflow from hospital to nursing homes. Another improvement concerning technology was that GPs at the COVID GPC were given access to the patients' GP records to improve efficiency. Improvements were also made at the professional level. Very early on, a regional crisis team was formed, including specialists from both hospitals, GPs and managers from the GP partnership. This could be set up very quickly as these working partnerships already existed. Furthermore, the GP partnership played an important role in bringing both hospitals together as they wanted to make joint agreements. Previously, this was often done separately per hospital (Q5). In the organizational dimension, administrators and policy makers used the existing regional counsel for the acute care network, called the "ROAZ" (Regional organization of acute care), as a platform for discussion and decision-making. At a national level, these ROAZs were encouraged to take responsibility for the region. As such, the ROAZ also rapidly formed a crisis team, which consisted of administrators with a certain mandate for making quick decisions (Q6).

Q6: *"You know, they acted, they set up a crisis team, they made decisions (and maybe they weren't always the best decisions, in retrospect), but they were able to face the crisis in this region. […] They really took some good steps."* Ins2

Research question 2: What were the facilitators and barriers for cooperation during the crisis?

An overview of the results is given in Table 4.

In the clinical dimension, clear agreement about work processes and a fixed coordination team who were facilitating contact between all employees of the COVID GPC, really facilitated cooperation (Q7). Normally, the medical assistants, nurse practitioners (NPs), and GPs start their shifts at the GPC at various times, resulting in very little contact, a lack of clarity about the assignment of roles, no structural moments for feedback and communication difficulty (Q8-9). Due to fragmentation of home care and nursing home organizations, and therefore no central point of contact, outflow continued to be a barrier in several ways (Q10). Finally, the lack of accessibility to a joint Electronical Health Record (EHR) was noted as a significant barrier to cooperation (Q11). The PC+ facilitated an understanding of each other's challenges, and as a result a growth of personal relationships and trust. There was a general willingness to take on other tasks and responsibilities, and most clinicians said that they felt appreciated by their colleagues, both within and across organizations. A mismatch between the managerial levels and the clinical level was mentioned repeatedly. Some felt that managers meddling too much in the workflow, and making unnecessarily adjustments (Q12). The distribution of care was especially relevant for patient tasks which could be done equally well by different groups of clinicians, so clear agreements were made. Stakeholders speculated about the role financial interests could have played for both parties in different ways because of the difference in payments for Fee-for-Service (FFS) versus a fixed monthly capitated payment. However, many clinicians emphasized that the most important incentive for any clinician is simply to provide the best patient care possible (Q13).

Q8: "So, what the GP did was call the medical assistant instead of the GP colleague and leave the problem with her. Well, that means nothing is going to change of course. You have to address your colleague personally, but that is quite difficult. [...] Look, at your own daytime practice you really know your colleagues well and I can tell them everything. But at the GPC, with a random other GP? That doesn't happen." GP

In the professional dimension, the regional crisis team consisting of professionals and managers from different organizations met regularly. It was very easy to share feedback at the professional level. For example, a specialists felt that GPs in general were too quick to send COVID patients to the hospital. The regional crisis team was a good place for discussing these issues. Another improvement was the creation of shared protocols between professionals. For example, the Pulmonologists from both hospitals got together to create a shared protocol for treating COVID patients with pulmonological comorbidities (Q14-

Q15). The regional crisis team felt that they were better able to make quick decisions than the administrative level, because organizational interests did not seem as relevant at the professional level. Professionals and managers also felt that their sense of urgency was stronger than that of administrators, as they were closer to the workplace (Q16-17).

Q16: *"I think it's important that you don't only tackle these kinds of crises at the administrative level, but also, especially, at a doctor-level. [...] You know, the one standing hands-on at the ED, seeing the ICU filling up, seeing colleagues with no PPE [...]. Because if you leave that for the administrative level, then there will always be organizational interests that play a role. [...] And that's just not right in a situation like this." (ManGP)*

In the organizational dimension, some challenges concerning communication arose due to ambiguity about criteria for defining a patient as COVID-suspect, causing unclear situations where one party arrived with protective clothing while the other party was not wearing any. Another example was the quick decision to set-up the COVID GPC at hospital 1 rather than hospital 2. Much of the COVID care went to hospital 1 via the GPC, despite the fact that hospital 2 also set up a COVID ward and was prepared to receive COVID patients through their ED (Q18-19). Furthermore, the fragmentation of organizations contributes greatly to difficulty in communication. The multitude of home care and nursing home organizations caused patient outflow to be quite an issue in the acute care network, because the variation between their policies and the communication towards the hospitals was not clear (Q20-23). The GP partnership tried to convince the nursing home organizations to create a centralized COVID ward, saving personnel, PPE, and space. However, the nursing home organizations decided to divide their COVID patients between three of the organizations due to limited space and competition, and they reported not having appreciated the interference in their process (Q24-25). Such unresolved issues led to mistrust and negative assumptions about the motivations of other organizations. On the other hand, the frequent contact between administrators of various organizations at the ROAZ during the COVID-19 crisis, improving trust (Q26). Trust also grew by seeing other organizations putting in their best efforts. In general, stakeholders agreed that "trust takes years to build, seconds to break, and forever to repair". As a solution for improving trust, a clean, competition-free foundation might be necessary (Q27). The government had encouraged the ROAZs to take responsibility in handling the crisis. As such, a regional counsel, previously with little mandate, became the platform upon which many decisions were made (Q28). As a barrier for cooperation within the ROAZ, administrators of nursing home organizations said that they felt misunderstood and misrepresented at times (Q29), but the crisis facilitated a faster inclusion

of these organizations (Q30). The fact that interests were subordinated to the mutual gain of overcoming the crisis was perhaps one of the greatest facilitators for cooperation, because interests are usually seen as a large barrier in cooperation (Q31). During the crisis, stakeholders were reminded of their common interest, namely optimizing care for the patient (Q32-33). However, the funding system and the resulting competition between providers complicates cooperation (Q34). At the same time, several stakeholders also expressed that competition is unnecessary because there is already an excess of patients needing acute care (Q35). Decisions were also made to centralize other acute care within the hospitals in order to even out the burden of patients needing intensive care, and with it the sharing of personnel (Q36-37).

Q32: *"At the end of the day, there is only one interest and that is that we provide the best patient care. And that is what brings you together, that is what you share with the other parties, that must always be the starting point." (AdmGP)*

In the system dimension, the national association for insurers sent a "comfort letter" to the organizations in which they explained they would fairly compensate fairly any extra expenses due to the crisis (Q38). However, in response to the growing costs of arrangement of COVID care hotels, insurers made the regional ROAZs responsible for financial approval of these plans (Q39). Insurers felt that the crisis brought the insurers as a group closer to the rest of the acute care network (Q40). The issues experienced concerning the fragmentation are not as relevant for the insurance companies as they have the same vision for the future (Q41). However, this practice is not entirely flawless as several stakeholders felt that pilots and initiatives are still often hindered by the fact that certain decisions cannot be made on behalf of the other parties (Q42-43).

Q40: *"We did become more involved. I don't know if that will be a long-term effect, that remains to be seen. But at that moment we were really closer than we were before." (Ins2)*

Two external parties

A representative of The Hague Red Cross was positive about the partnership with the acute care network during the crisis. It was very easy to find and make the right contacts, resulting in good communication. A few barriers were mentioned, as such volunteers from the Red Cross helped out at the COVID GPC, but staff at the GPC was not always apprised of the volunteers' tasks and limitations. Furthermore, arrangements with the Red Cross were made separately per organization as no organization played an overarching

managerial role. They had expected the GHOR, responsible for coordination of the regional acute care network, to take up this role.

A representative of the GHOR was present at meetings of the ROAZ to oversee the proceedings on behalf of the government as a regional administrator. The representative was encouraged by the distribution of care which took place between the hospitals. A barrier mentioned by nursing home organizations was the lack of professional organization, which complicated their efforts. Another barrier the lack of clear agreements about certain situations, which often resulted in last-minute problem-solving.

Research question 3: Which changes in cooperation are desirable in order to improve the accessibility of acute healthcare?

Table 5 gives an overview of the dreams. Eventual goals for the GPC include a partly fixed group of GPs at the GPCs, clear agreements about task division between GPs, NPs and medical assistants to facilitate better cooperation. Furthermore, many stakeholders would like to see PC+ continued in the acute care setting beyond the COVID-19 crisis. They added that it would be very helpful to include elderly care physicians and psychiatrists in that structure as well. Taking it a step further, stakeholders dreamed of having a common registration desk, combining and coordinating acute care as much as possible (Q44-45). However, where the GP partnership would go as far as combining all services into one acute organization, some organizations thought that would be a step too far (Q46). Stakeholders expressed a desire for better integration of different EHRs. A desire for an investment into more digital solutions such as digital triage and consultations was also mentioned. Several participants mentioned that it would be good to invest in more interprofessional education, to discuss calamities together with all involved organizations, and to continue structural meetings between professionals after the crisis (Q47-49). The development of a shared vision across organizations was discussed (Q50). Along with transparency, many stakeholders said that it would be beneficial if there were transparency concerning the available patient-capacity in each organization (Q51). For example, ambulance services knowing the current pressure on each of the EDs in the region in real-time would help them allocate their services better. Stakeholders mentioned that the funding system may not always promote the best patient care, as it includes financial incentives (Q52-54) and therefore health insurers suggested improving this by creating one uniform emergency rate per patient (Q55-56).

Table 4: An overview of facilitators and barriers to cooperation

		Normative integration					Functional integration	
Themes		**Communication**	**Interaction**	**Trust**	**Leadership**	**Interests**	**Distribution of care**	**Funding**
Facilitators (+) and Barriers (-)	Clinical	+ Clear agreements about work processes + Common start of the shift at GPC - No structural moment for feedback at the GPC - Outflow still difficult, no central point of contact - Lack of access to EHR	+ Understanding of each other's challenges, appreciation grew + Positive work environment + Learning curve - Lack of shared trainings and activities	+ Improved due to increased interaction in PC+	+ Freedom to confront supervisors about issues - Mismatch managerial levels and workplace	+ Job satisfaction + Keeping workload low + In the end: Best patient care - Own safety - Financial incentive to work at C-GPC	- Pulmonology vs internal medicine: who does COVID care?	- Fee-for-Service vs fixed monthly capitated payment - Unclarity about recompense specialists doing PC+
	Professional	+ Easily accessible + Good place to share feedback	+ Frequent contact + Creation of shared protocols	+ Was present	+ Quick decision-making - More difficulty with administrative level			
	Organizational	- Ambiguity criteria definition COVID-suspect - Set-up C-GPC at H1, one-sided decision - No clear policies and communication towards the hospitals from the various nursing homes - Interference in each other's business (outflow)	+ ROAZ as a good platform for discussions	+ Frequent contact improved trust, transparency in the ROAZ + Seeing best efforts of other organizations - Unresolved issues let to mistrust - Need a competition- free foundation	+ ROAZ as a great facilitator, mandate during the crisis - Nursing homes not included in ROAZ in the beginning	+ Urgency & dependency + Mutual gain of overcoming the crisis + The patient as most important common interest - Other interests: profiling, safety own employees - Competition	+ Centralize acute care + Sharing of personnel + Excess of patients, no need to compete + COVID-19 crisis opened up a new dialogue	- Funding system causes competition

Table 4: Continued

		Normative integration					Functional integration	
Themes		**Communication**	**Interaction**	**Trust**	**Leadership**	**Interests**	**Distribution of care**	**Funding**
Facilitators (+) and Barriers (-)	System	+ Managerial levels have good contact with insurers + Transition of care improves contact - Settlement post-COVID is complicated	+ Insurers closer to the acute care network than before	+ "Comfort letter" from insurers + ROAZ as eyes for the insurer	+ Two regional market leaders: works well, on good terms with each other	+ Best patient care + Affordable care: cost efficiency		

GPC: General Practitioner Cooperative, PC+: Primary Care Plus, C-GPC: Covid-GPC, H1: hospital 1, ROAZ: Regional organization of acute care

Q45: *"I would really want to see one central, coordinated point for triage and transfer to all beds. [...] and to go to one call center, where the GP keeps the responsibility, [...] a place where you can make a connection between the ambulance services, the acute problems coming from the nursing homes, and the emergency telephone number from the mental health services. These all exist already, but bringing them together under one header [...], physically, and having one registration desk at the ED where you're simply helped by the person who can help you best..." (ManGP)*

Table 5: Stakeholders' dreams for the future

Level	Wishes
Clinical	Fixed group of general practitioners at GPC Clear agreements, common start of shift Continued Primary Care Plus Integration of all services: common registration point Digital solutions: electronic health records, consultations
Professional	More interprofessional education Discuss calamities across organizations Set up structural meetings
Organizational	Formulate shared vision Make interests clear from the beginning Transparency in capacity
System	Change funding Facilitator role for health insurers

Limitations

A limitation of this study is the use of purposeful sampling and snowball expansion of the study participants. Non-probability sampling relies on the subjective judgement of researchers and may be influenced by unmeasurable bias as well as unmeasurable motivations of participants. The loss of eight out of 22 requested surveys could potentially bias the results as well. There are threats to the validity of the questionnaire because of the low number of responses, the lack of evidence of validity and the lack of significant differences between the three time frames. As such, the questionnaire is intended to provide a baseline overview of the changes seen in integration during the crisis and is therefore secondary to the qualitative results. Another limitation is the fact that we only interviewed one or two stakeholders per dimension per organization. Finally as no patients or patient organizations were included in our study, it summarizes the influence of COVID-19 on clinical practitioners only.

Discussion

Our exploratory mixed-methods study shows that better integration is possible when all organizations experience a sense of urgency and dependency. For a

good integrated system, improvements on all levels of integration are needed. Previous studies like Suter *et al.* determined principles of integration, such as the need for a population health focus in which an integrated healthcare system should be easy for patients to navigate, the importance of integrated EHR, and the need for good financial management which allows pooling of funds across services. [26] Breton *et al.* concluded that the funding model is "inadequate for centering care around the needs of patients" [27] Lindner *et al.* observed the COVID-19 pandemic from a broader, European perspective and came to the conclusion that the pandemic has acted as an accelerator for redesigning and integrating care pathways. [28] Our research adds a new aspect: a shared sense of urgency is essential if better integration is to be achieved.

The COVID-19 crisis may be causing a shift from segregation to integration in our region, except at an organizational level. Many barriers were identified in the organizational dimension, such as the ambiguity in the criteria definition COVID-suspect, lack of clear policies and communication between hospitals and the various nursing homes, unresolved issues leading to mistrust, and a misaligning of priorities between the different organizations. There are many opportunities for improvement of these issues. The functional aspects like a shared EHR and adequate funding were lacking and not solved during the pandemic, leading to the question of whether the achieved extra integration for acute services will survive the next phase in the absence of a health crisis. Strengths of this study include our having explored integration at all levels of organization using the RMIC as a framework for evaluating the acute care network as a whole, across more than ten different organizations. The methods and analysis are built upon strong theoretical frameworks concerning cooperation and integration. The mixed-methods approach, in which the questionnaire is used as a visual baseline, further strengthens the qualitative results.

To that end, the driving force behind all changes in integration of acute care organizations in urban context during the COVID-19 crisis seemed to be a great sense of urgency to cooperate in the shared interest of providing the best patient care. We recommend shifting the post-crisis focus from overcoming the crisis to overcoming cooperative challenges and from a research point of view more research concerning integration of the acute care network on larger-scale with more involved stakeholders and research from a patient perspective. Further, similar research in other areas would be beneficial. As countries have different dynamics and different organizations involved in the acute care network, similar research studies performed in other nations would be useful for generalizing the results of this and similar research.

Acknowledgements

This study was sponsored by ZonMw. ZonMw did not play any part in the design, analysis or in the decision to publish the results of this study.

References

1. Moskop JC, Sklar DP, Geiderman JM, Schears RM, Bookman KJ. Emergency department crowding, part 1--concept, causes, and moral consequences. Ann Emerg Med. 2009;53(5):605-11.
2. Pines JM, Hilton JA, Weber EJ, Alkemade AJ, Al Shabanah H, Anderson PD, et al. International perspectives on emergency department crowding. Acad Emerg Med. 2011;18(12):1358-70.
3. Chan SS, Cheung NK, Graham CA, Rainer TH. Strategies and solutions to alleviate access block and overcrowding in emergency departments. Hong Kong Med J. 2015;21(4):345-52.
4. Bittencourt RJ, Stevanato AM, Bragança C, Gottems LBD, O'Dwyer G. Interventions in overcrowding of emergency departments: an overview of systematic reviews. Rev Saude Publica. 2020;54:66.
5. Frandsen BR, Joynt KE, Rebitzer JB, Jha AK. Care fragmentation, quality, and costs among chronically ill patients. Am J Manag Care. 2015;21(5):355-62.
6. Ranney ML, Griffeth V, Jha AK. Critical Supply Shortages - The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic. N Engl J Med. 2020;382(18):e41.
7. Stall NM, Farquharson C, Fan-Lun C, Wiesenfeld L, Loftus CA, Kain D, et al. A Hospital Partnership with a Nursing Home Experiencing a COVID-19 Outbreak: Description of a Multiphase Emergency Response in Toronto, Canada. J Am Geriatr Soc. 2020;68(7):1376-81.
8. Kroneman M, Boerma W, van den Berg M, Groenewegen P, de Jong J, van Ginneken E. Netherlands: Health System Review. Health Syst Transit. 2016;18(2):1-240.
9. Starfield B, editor Is strong primary care good for health outcomes. The future of primary care: Papers for a symposium held on 13th September 1995; 1996: Office of Health Economics.
10. Kulu-Glasgow I, Delnoij D, de Bakker D. Self-referral in a gatekeeping system: patients' reasons for skipping the general-practitioner. Health policy. 1998;45(3):221-38.
11. Van der Maas J RM, Smits M, van Boven K,, P. G. Spoedzorg in de huisartsenpraktijk: onderzoek naar de contactfrequentie, patiënten zorgkenmerken. Huisarts en Wetenschap 2018; 61: 36-43. 2018.
12. van der Wulp I, van Baar ME, Schrijvers AJ. Reliability and validity of the Manchester Triage System in a general emergency department patient population in the Netherlands: results of a simulation study. Emerg Med J. 2008;25(7):431-4.
13. DutchHealthcareAuthority. Market scan acute care [in Dutch: Marktscan acute zorg 2017]. https://pucoverheidnl/nza/doc/PUC_3650_22/1/. 2017.
14. Kodner DL. All together now: a conceptual exploration of integrated care. Healthc Q. 2009;13 Spec No:6-15.
15. Stange KC. The problem of fragmentation and the need for integrative solutions. Ann Fam Med. 2009;7(2):100-3.
16. Gemeente Den Haag, Dienst Burgerzaken. Den Haag in Cijfers. Available at URL: https://denhaagincijfersnl. 2020.
17. The Hague: Treatment Outside Office Hours. Available at URL: https://wwwdenhaagnl/en/in-the-city/health-care/treatment-outside-office-hourshtm June, 2020.

18. Hadoks. Over Hadoks, 2020. available at URL: https://wwwhadoksnl/over-hadoks/. 2020.
19. Power N. Extreme teams: Toward a greater understanding of multiagency teamwork during major emergencies and disasters. American Psychologist. 2018;73(4):478-90.
20. Valentijn PP, Boesveld IC, van der Klauw DM, Ruwaard D, Struijs JN, Molema JJ, et al. Towards a taxonomy for integrated care: a mixed-methods study. Int J Integr Care. 2015;15:e003.
21. DutchHealthcareAuthority. Monitor acute care 2018 [in Dutch: Monitor acute zorg 2018]. Available at URL: https://pucoverheidnl/nza/doc/PUC_260889_22/1/ 2018. 2018.
22. Bell J KE, Opheij W. . Bridging disciplines in alliances and networks: in search for solutions for the managerial relevance gap. International Journal of Strategic Business Alliances. 2013;3(1):50-68.
23. Creswell JW, Poth CN. Qualitative inquiry and research design: Choosing among five approaches: Sage publications; 2016.
24. Valentijn P, Angus L, Boesveld I, Nurjono M, Ruwaard D, Vrijhoef H. Validating the Rainbow Model of Integrated Care Measurement Tool: results from three pilot studies in the Netherlands, Singapore and Australia. International Journal of Integrated Care. 2017;17(3).
25. Smeele P, Kroese M, Spreeuwenberg MD, Ruwaard D. Substitution of hospital care with Primary Care Plus: differences in referral patterns according to specialty, specialist and diagnosis group. BMC Fam Pract. 2019;20(1):81.
26. Suter E, Oelke ND, Adair CE, Armitage GD. Ten key principles for successful health systems integration. Healthcare quarterly (Toronto, Ont). 2009;13 Spec No(Spec No):16-23.
27. Breton M, Wankah P, Guillette M, Couturier Y, Belzile L, Gagnon D, et al. Multiple Perspectives Analysis of the Implementation of an Integrated Care Model for Older Adults in Quebec. International journal of integrated care. 2019;19(4):6-.
28. Lindner S, Kubitschke L, Lionis C, Anastasaki M, Kirchmayer U, Giacomini S, et al. Can Integrated Care Help in Meeting the Challenges Posed on Our Health Care Systems by COVID-19? Some Preliminary Lessons Learned from the European VIGOUR Project. International journal of integrated care. 2020;20(4):4-.

Additional material Chapter 5

Appendix 1: Questionnaire

The stakeholders received a digital questionnaire based on topics of the validated RMIC Measurement Tool. The answer choices corresponded with different stages of integration: completely segregated (score 1), aligned (score 2), coordinated (score 3), and completely integrated (score 4). Each question was asked three times, pertaining to three different situations: the situation *before* the COVID-19 crisis, the situation *during* the COVID-19 crisis, and the *preferred* situation.

Topics questionnaire

Dimension	Topic
Clinical integration	Triage
	Insert right healthcare professional
	Transfer patient data
	Case-management
	Coordination patient outflow
Professional integration	Vision stakeholder
	Protocols
	Interprofessional Education
	Interprofessional governance
Organizational integration	Learning organization
	Evaluate functioning of acute care network
	Common goals
	Complaints procedure
	Service-management
Functional integration	Information management
	Feedback quality indicators
System integration	Environmental management
	Cooperation insurers
	Cooperation inspection
	Cooperation network acute care in region
	Cooperation patient association and client council
Normative integration	Trust
	Visionary leadership
	Informal cooperation

Appendix 2: Topic list for interviews

Semi-structured interviews with key stakeholders in the acute care network during the COVID-19 crisis in The Hague.

1. Facilitators to cooperation during the COVID-19 crisis
2. Barriers to cooperation during the COVID-19 crisis
3. Topic list: normative aspects of cooperation (see table below). Based on "Five lenses on cooperation" by Bell *et al.*
4. Dreams for the future
5. [If necessary: discuss questionnaire responses]

Topics	Sample Questions
Shared vision and ambition	Was there a shared vision and ambition with all partners? And is there a vision for after the COVID-crisis?
Gains	What does your organization gain from cooperation? Wherein do the gains differ between organizations?
Trust	Do you trust all partners? Do you feel comfortable handing patients over to colleagues of another organization?
Affective relations	Do you feel that your efforts are noticed and appreciated?
Culture and communication	Do you understand colleagues of a different organization or discipline? Are there barriers in communication?
Leadership roles	Are the roles clearly distributed within and between organizations? Is it clear who is responsible for what aspect and do you know how to reach them?
Accountability	Is there room for accountability and feedback?
Transparency	Was there always transparency in the steps that were taken? Are organizations open about their financial gains?
Friction	How do organizations deal with possible friction?

Supplement I: Quotes

All interview results are substantiated with quotes of the stakeholders, here in this appendix you will find all quotes. After each quote, information about the interview is written down in the abbreviation as mentioned in table 1 of the article.

Research question 1: What changes in cooperation took place during the crisis?

Q1*: "Never waste a good crisis, because it synchronizes everyone. Everyone's dealing with the same thing, namely: trying to survive in a crisis that was so huge that none of us had ever dealt with anything like it. And yeah, that connected us."* AdmNH1

Q2: *"The connection with the GPs went really fast. We already have a GPC here, but taking that barrier away between the GPC and the ED [...] that is a beautiful illustration of something that I wish we could continue in the future. [...] But not only*

the functional barriers were removed, the physical barriers were removed as well, so it was much easier to visit each other." AdmH1
Q3: *"So when you see from each other how it works, what you're doing – and that was the case at the COVID GPC: the residents saw what the GPs were doing, and the GPs saw how the residents assessed their patients […] – it was super educational…. And fun; it makes the work more challenging."* NP
Q4: *"They assess such a [geriatric] patient […] and they know exactly where to be […] and they also have just that bit more insight into the possibilities at a certain [nursing] home or just at [the patient's] home, and they can give advice about that."* SpH1
Q5: *"If you just say: 'We as GPs only make agreements with both of you together', well then that's a given for them. […] Then they don't have a choice, and that makes it much easier."* ManGP
Q6: *"You know, they acted, they set up a crisis team, they made decisions (and maybe they weren't always the best decisions, in retrospect), but they were able to face the crisis in this region. […] They really took some good steps."* Ins2

Research question 2: What were the facilitators and barriers for cooperation during the crisis?

Clinical integration

Q7: *"We communicated really clearly about what we were going to do. I think that that played a big part in the fact that it all worked well. […] I think that there is a need for that."* NP
Q8: "So, what the GP did was call the medical assistant instead of the GP colleague and leave the problem with her. Well, that means nothing is going to change of course. You have to address your colleague personally, but that is quite difficult. That is really difficult. I don't think we have that kind of culture. No, and that is really a pity. Look, at your own daytime practice you really know your colleagues well and I can tell them everything. But at the GPC, with a random other GP? That doesn't happen." GP
Q9: "[Accountability] between medical specialists is always a little complicated. […] Those are the guys and girls you trained with, whom you know well, who experience the same difficulties… so addressing them is difficult. It does happen more frequently than before, but that's also because that topic is included more during training." SpH1
Q10: "*So, we do have good contact with the transfers department, which cooperates a lot with the home care and nursing home organizations. […] But it's not like you can easily arrange for home care during your shift, there is no central point of contact for all home care organizations in The Hague, so […] I have no idea how I could reach all of them […]. I think that they can do much more than we know they can, so we often admit people to the hospital who would never have needed to be admitted if we could have arranged for home care." (SpH2)*
Q11*: "The hassle that this causes is enormous." (SpH1)*
Q12*: "Sure, I don't mind doing that. But then let's make really clear agreements about it." (NP)*

Q13*: "The most important thing is that you look at the patient. A doctor doesn't work with financial interests; a doctor just wants to help the patient as fast as possible. That's the most important thing." (AdmH2)*

Professional integration

Q14: "We also created a protocol together about how to deal with COPD and asthma and COVID and that went really well actually. […] That, in itself, can already be called a victory." (SpH2)

Q15: *"We have to start working from the same protocol. […] The FMS and the NHG making those protocols together, that was great, that is what it's all about." (ManGP)*

Q16: *"I think it's important that you don't only tackle these kinds of crises at the administrative level, but also, especially, at a doctor-level. […] You know, the one standing hands-on at the ED, seeing the ICU filling up, seeing colleagues with no PPE […]. Because if you leave that for the administrative level, then there will always be organizational interests that play a role. […] And that's just not right in a situation like this." (ManGP)*

Q17: *"During that initial phase there were mostly administrators sitting at the table. […] It was all really slow and difficult at the administrative level, and when the administrators said: "You know, go ahead and arrange it with our managers", things were finally set in motion." (SpH1)*

Organizational integration

Q18: *"I was just disappointed. I thought: 'Well, we set everything up here and now they're all going to [Hospital 1]'. So yeah, I think there could have been better communication between [Hospital 1] and us." (ResH2)*

Q19: *"That decision about the COVID GPC was not made together. That was decided, one-sided, and communicated to us. […] But afterwards there was no room to talk about and look at it again. […] I think the puzzle could be solved differently and that would be better for the patient." (SpH1)*

Q20: *"Since there isn't an umbrella organization there is also a lot of variation between their policies. […] We only hear what their policy is the moment that we're calling the [nursing] home, and then you're suddenly confronted with this question […]. And one [nursing] home says one thing, and the other home says another thing. […] So I don't think it's bad at all that they are making certain choices, but the communication about those choices is insufficient." (SpH2)*

Q21: *"It is very fragmented: everyone has their own agreements, their own wishes… and it's just not at all clear what has to happen in order to transfer patients to a nursing home." (SpH1)*

Q22*: "[In the ROAZ] we did discuss this. But that didn't go very smoothly from my perspective. That could have gone better. But I'm not exactly sure why that is. […] There was some sort of a communication-barrier that we did not know how to*

overcome, neither we nor they actually. That coordination did improve gradually. […] But if anything has room for improvement, it's that [outflow]." (AdmH1)
Q23: *"At the beginning you couldn't really place anyone. […] There were barely any home care organizations who had the means to take care of COVID patients, and the nursing homes also didn't have any places yet." (ResH2)*
Q24: *"The numbers they were asking would never have fit in one location in one nursing home." (AdmNH2).*
Q25*: "We resisted […] because we as [care organizations] felt strongly that the GPs wanted to decide who was going to go to which bed at which nursing home. But that's not their business, it's ours. […] And I never felt an invitation to organize it together. I experienced directives. […] And then you're overstepping your boundaries. We have a system that has worked for years in which we divide [the patients], and about which we have made agreements, also looking from a competition-perspective, to make sure it is divided fairly. […] Eventually we made agreements to discuss these things at a management level, so now [our directors] meet regularly with people from [the GP fellowship] to organize the process well." (AdmNH2)*
Q26: *"That daily contact and questioning also greatly facilitated that it was done with maximum openness and integrity." (AdmH1)*
Q27: *"You have to remove the problem by organizing the funding as cleanly as possible. […] If the foundation is good […], then you can build on that. And then trust can continue to grow.' (AdmNH2)*
Q28*: "Before the corona crisis it was somewhat of a difficult situation: 'What do we do with that ROAZ, how much power do they actually have?' […] Well, then the corona crisis was born and all of a sudden there was a kind of window in which the ROAZ thought: 'now I can take that role that the government expects of me.' […] And that went pretty smoothly." (ManAS)*
Q29: *"…recognizing that in a "slow" disaster, which is what we are dealing with now, there are other parties involved who you should really know and also allow a place at the table in advance, […] otherwise you're always a step behind." (AdmNH1)*
Q30: *"That whole structure around acute care during crises and the ROAZ already existed of course […], and the [nursing home organizations] are just the odd one out in that group. […] So that is a positive side effect as far as I'm concerned, that the [nursing home organizations] have been connected much more quickly and firmly than otherwise would have been the case." (AdmNH2)*
Q31: *"Well, something that was really beneficial and that is maybe normally missing, was that everyone had the same goal now, which was: put the shoulder to the wheel and go for it, and we have to do this together. Normally it is much more fragmented and everyone looks at 'what's in it for me?' And now we didn't have that choice." (GP)*
Q32: *"At the end of the day, there is only one interest and that is that we provide the best patient care. And that is what brings you together, that is what you share with the other parties, that must always be the starting point." (AdmGP)*

Q33: *"You have to set it up together, each from your own perspective and discipline, and based on the interest of 'what does that patient or client need'. But there should be no organizational interests, financial interests, ego interests, or whatever… those shouldn't be part of it." (AdmNH2)*
Q34: *"The downside of market forces in care is competition. And that care providers don't think about the interest of the patient but that they think about their own wallet and their organizational interests." (AdmNH2)*
Q35: *"Everyone can see that there is enough care to be given, so I think that makes people more willing to divide up some of it. I don't think anyone needs to fear that they'll lose their right to exist, so that makes it easier to fight less about domains." (SpH2)*
Q36: *"Those conversations actually went really well […]. Of course, it wasn't a very extraordinary move to bring the cardio to [hospital 1] and the trauma to [hospital 2], because these are quite natural trends for the hospital. So we have also had very positive developments because the trauma surgeons from [hospital 1] came here right away and walked the floor, so within those groups that only led to improved cooperation." (AdmH2)*
Q37: "The specialists as well, so the knowledge and know-how were transferred from one hospital to another. So the surgeon who normally treated his trauma patient in [hospital 1] had now received a pass for the operating room in [hospital 2]. Well, you could call it revolutionary. Everybody actually thought it was quite normal that that happened, but still, it was a bit special." (ManAS)

Systems integration
Q38: *"In fact, we said: 'You see what is happening at the workplace, and you know how to act accordingly, so do that, and don't be hindered by the current contracts.'" (Ins1)*
Q39*: "With the insurer the roles were somewhat reversed, because usually we have to present all our plans, get permission, and then the funding. But now […] the arrangement is that the insurers must fund what we carry out, because we're simply carrying out an assignment [from the ROAZ]. […] But the insurers were cooperative." (AdmGP)*
Q40: *"We did become more involved. I don't know if that will be a long-term effect, that remains to be seen. But at that moment we were really closer than we were before." (Ins2)*
Q41: *"Between insurers that goes really well, there isn't ever really mistrust, at most we just don't agree with each other." (Ins1)*
Q42: *"Concerning insurers, there isn't really one, large dominant one. So [insurer 1] and [insurer 2] formed some sort of alliance, and together they have just 51%… […] but things keep getting stuck with the insurers. […] So when the hour comes and it's time to make the commitment and put down the signature, then they say: 'Yes, but it's complicated and we should really go talk to the other parties…'" (ECP)*

Q43: *"But actually, it's the insurer: in the end they have to pay for everything. […] I think the problem for us is that we have five insurers […] and there isn't one [who is overall responsible] […] and therefore also none really with an interest. […] [In our region] it's all so small, so it's already a really small piece of their pie, and then [The Hague] is only, well, maximum 20% of the region…" (ManGP)*

Research question 3: Which changes in cooperation are desirable in the future in order to improve the accessibility of acute healthcare?

Clinical integration

Q44: *"…one emergency station here, without a distinction between GPC and ED: that wall has to go. And you just have to work together with the GPs in one place, with one registration desk […]. And as far as I'm concerned, we even add a dentist and a psychiatrist, because we really miss those." (SpH1)*

Q45: *"I would really want to see one central, coordinated point for triage and transfer to all beds. […] Second, I would really like to go to one call center, where the GP keeps the responsibility, […] a place where you can make a connection between the ambulance services, the acute problems coming from the nursing homes, and the emergency telephone number from the mental health services. These all exist already, but bringing them together under one header […], physically, and having one registration desk at the ED where you're simply helped by the person who can help you best, and being able to call in help from a specialist as a GP…" (ManGP)*

Q46: *"I think that it's good to keep the separation of knowing what your own tasks are. And there should be a lot of sharing of information, there must be a lot of cooperation, but combining everyone into one organization… Well, I don't think that's necessary because I have the feeling that if you cooperate really well, you can already get really far." (ManAS)*

Professional integration

Q47: *"If you want cooperation to take shape in the acute network, then you'll have to adjust the training accordingly." (SpH1)*

Q48: "You can learn so much from that […]. I notice that when we discuss a calamity […], doctors tell [assistants who do triage]: 'My goodness, what a difficult conversation! You did that so well.' They have no idea! […] And that gives so much trust and insight, and because of that, respect for each other's execution of work." (NP)

Q49: *"The cooperation has been intensified by the crisis, so now we have an opportunity to set up something structural with meetings […]. And perhaps there should indeed be a joint vision document that everyone can refer to in their own strategy document. So that the islands become a little less like islands." (SpH2)*

Organizational integration

Q50: *"There should be some sort of vision developed in which we say: […] this is where we want to go. I think that awareness needs to come to everyone. […] Even if everyone*

thinks it's a good idea, actually doing it is a different story. […] What needs to happen is that we need to start that conversation […], that's step one. […] Because if you don't have that […], then nothing's going to happen." (GP)
Q51: *"Concerning my wish list for the future, it would be nice if – for both the nursing homes as well as our fellow hospitals -- […] it would be clear to all parties what capacity is available in the region." (AdmH1)*

System integration
Q52: *"So there is a law and a corresponding funding that determines where someone ends up, instead of looking at such a client and asking: "What does that person actually need and who is best able to offer that?" (AdmNH1)*
Q53: *"That's why you should move towards a different funding system, where it doesn't matter who sees the patient because everyone gets a share of the money. Because now the situation is: the one who sees them gets the money. And apparently that doesn't work because that doesn't make that you establish the best care, it makes you look at the financial incentive." (GP)*
Q54: *"Look, the health insurers say […]: 'It is always possible to organize something within the existing laws and regulations'. Yeah, right! So why hasn't it been organized yet if it's so easy? […] It really has to do with the way in which we have arranged this funding system. But if you turn it around and you organize it differently, staying away from market forces […] and just say: 'Well, this is what we need to organize with each other', and the health insurer frees up the resources.... [it would be easier]." (AdmH1)*
Q55: *"What about creating one uniform emergency rate per patient? […] But including acute mental health, including home care… Which then changes the incentive […]: it's not about money, […] it's about: 'How do I solve this problem in the best way?'" (Ins2)*
Q56: *"Our job is to take care of the wallet, and I don't mind that at all. But at some point, you do want to feel that the things you're spending the money on are actually things that make healthcare better." (Ins1)*

Supplement II: Dubbelpublicatie Huisarts & Wetenschap

COVID-19 versnelt samenwerking in de spoedzorg

De acute zorg is overbelast en dreigt minder toegankelijk te worden. De coronacrisis heeft scherp duidelijk gemaakt dat de kwaliteit van de acute zorg, zeker in crisistijd, alleen op peil kan blijven als de betrokken organisaties en zorgverleners beter gaan samenwerken. Wij onderzochten welke factoren die samenwerking belemmeren of juist faciliteren, en hoe dat integratieproces in de toekomst beter kan – ook buiten crisistijd.

Inleiding

De organisaties in de acute zorg staan onder enorme druk en dat leidt tot grote problemen, zoals verminderde toegankelijkheid en uitstel van behandelingen. De coronacrisis heeft alle betrokkenen op scherp gezet en dat heeft de samenwerking binnen acutezorgorganisaties een stevige impuls gegeven

In de regio Den Haag, waar wij ons onderzoek uitvoerden, zijn veel verschillende organisaties actief binnen het het acutezorgnetwerk. Er zijn 2 ziekenhuizen met elk een huisartsenpost (HAP) en een afdeling spoedeisende hulp (SEH), en daarnaast een triagecentrum HAP, een meldkamer ambulancedienst, ambulances, HAP-visite-auto's, een crisisdienst voor acute psychiatrie, vijf grote verzekeringsmaatschappijen en vijf grote organisaties in de sector Verpleeg-, Verzorgingshuizen en Thuiszorg (VVT). Deze veelheid van organisaties kan alleen functioneren als er goed wordt samengewerkt op alle niveaus. Er zijn modellen ontwikkeld om die integratie te toetsen. Het Regenboogmodel onderscheidt op alle niveaus (micro, meso en macro) 2 vormen van integratie: functioneel en normatief. Bij functionele integratie gaat het om zaken als planning, humanresourcesmanagement, informatiemanagement en financieel management. De normatieve integratie is in het Samenwerkingsmodel uitgewerkt over 6 thema's: (1) gedeelde visie en ambitie, (2) gedeelde belangen, (3) vertrouwen, transparantie en wrijving, (4) affectieve relaties, (5) informele cultuur en (6) leiderschapsrollen.

Ons verkennende onderzoek had tot doel inzicht te krijgen in de mate waarin de samenwerking tussen acutezorgorganisaties in Den Haag verbeterde gedurende de coronacrisis. We hadden 3 onderzoeksvragen:

- welke veranderingen in de samenwerking vonden plaats tijdens de coronacrisis?
- wat waren faciliterende en belemmerende factoren voor samenwerking?
- welke veranderingen in de samenwerking zijn wenselijk om de toegankelijkheid van de acute zorg te verbeteren?

Methode
Ons onderzoek was een mixed-methods onderzoek met vragenlijstonderzoek en interviews. We selecteerden de eerste 4 stakeholders (een huisarts, een manager van een huisartsencoöperatie en uit beide ziekenhuizen een specialist) en wierven via hen weer andere stakeholders. Deze 'sneeuwbalmethode' leidde tot de inclusie van in totaal 22 stakeholders: op macroniveau 3 vertegenwoordigers van verzekeringsmaatschappijen, op mesoniveau 4 managers en 5 bestuurders, en op microniveau 10 clinici uit alle acutezorgorganisaties.

Ongeveer een week voor de interviews stuurden we de deelnemers een digitale vragenlijst om secundair aan het kwalitatieve onderzoek een basisoverzicht te krijgen van de integratieniveaus tussen de acutezorgorganisaties. De vragenlijst bevatte 23 meerkeuzevragen met betrekking tot de mate van integratie: (1) volledig gesegregeerd, (2) afstemming, (3) coördinatie en (4) volledig geïntegreerd. Elke vraag was in drievoud: hoe was de situatie vóór de coronacrisis, hoe was de situatie tijdens de coronacrisis en wat is de gewenste situatie? De vragen gingen onder andere over triage, inzetten van de juiste zorgprofessional, visie, interprofessionele educatie en nascholing, informatiemanagement, vertrouwen en leiderschap. De resultaten werden uitgezet op een likertschaal, gerapporteerd als gemiddelde en mediaan en per integratieniveau berekend voor elk van de 3 verschillende situaties.

Voor de interviews maakten we – met hulp van een expert op het gebied van verandermanagement – een *topic list* op basis van de 6 thema's uit het Samenwerkingsmodel.

De getranscribeerde interviews werden door 2 onderzoekers onafhankelijk van elkaar gecodeerd, gelabeld en geanalyseerd met behulp van speciale software (Atlas.ti). De beide onderzoekers bespraken onderlinge discrepanties en brachten zo nodig aanpassingen aan. Daarna groepeerden we alle codes opnieuw, waarbij we uiteindelijk uitkwamen op 8 thema's [**tabel**]. Tot slot bepaalden we voor elk thema op elk niveau of het de samenwerking belemmerde of juist faciliteerde.

Tabel Normatieve integratie: thema's volgens het Samenwerkingsmodel en in de interviews

Samenwerkingsmodel		**Interviews**
1	Gedeelde visie en ambitie	Toekomstperspectief
2	Gedeelde belangen	Interesse
3	Vertrouwen, transparantie en wrijving	Vertrouwen
4	Affectieve relaties	Interactie
5	Informele cultuur	Communicatie
6	Leiderschapsrollen	Leiderschap
–	(Nieuw)	Zorgverdeling
–	(Nieuw)	Bekostiging

Resultaten

Na exclusie van 5 vragenlijsten die niet binnen de gestelde tijd waren ingevuld en 3 vragenlijsten van verzekeraars die vragen over de klinische praktijk niet konden beantwoorden, includeerden we 14 vragenlijsten voor ons basisoverzicht. Op alle integratieniveaus gaven de respondenten zowel vóór als tijdens de coronacrisis lagere scores aan de samenwerking dan in de gewenste situatie. Alle respondenten waren voorstander van uitgebreidere samenwerking tussen de acutezorgorganisaties (voor de volledige resultaten zie ons originele artikel).

Daarna interviewden we tussen juli en september 2020 in totaal 22 stakeholders (16 individuele interviews en 3 duo-interviews). De interviews duurden 35-85 minuten.

Welke veranderingen in de samenwerking vonden plaats tijdens de coronacrisis?

Een van de ziekenhuizen richtte een COVID-HAP op waarin alle corona-huisartsenzorg uit de regio 24 uur per dag werd opgevangen om de druk op de SEH te verminderen. Zo ontstond op klinisch niveau een intensievere samenwerking tussen huisartsen en specialisten dan in een reguliere HAP, een vorm van anderhalvelijnszorg die in de reguliere huisartsenpraktijk al heel gebruikelijk is.

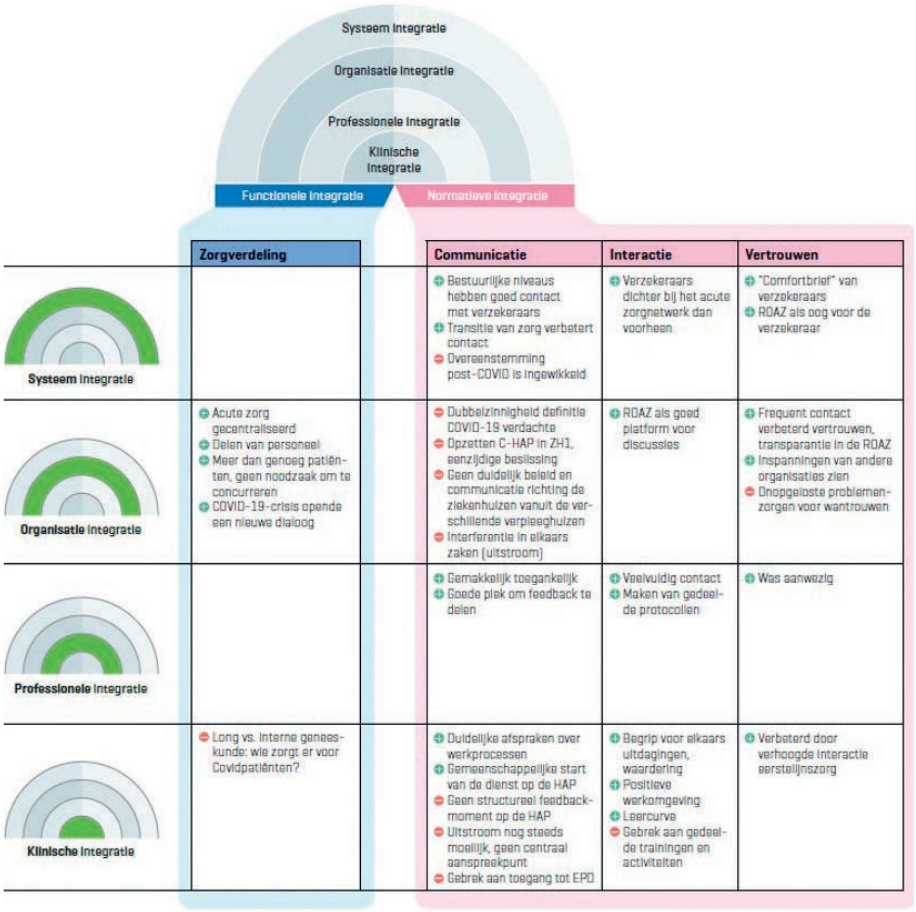
Een andere nuttige interventie was de plaatsing van een specialist ouderengeneeskunde op de SEH en verbetering van het systeem dat inzicht geeft in de beschikbare capaciteit bij verpleeghuisorganisaties. Beide ingrepen vergemakkelijkten de uitstroom van patiënten.

Ook op professioneel niveau werden verbeteringen doorgevoerd. Al heel vroeg werd een regionaal crisisteam opgericht bestaande uit specialisten van beide ziekenhuizen, huisartsen en managers uit de huisartsencoöperatie. Dit kon zo snel omdat deze samenwerkingsverbanden al bestonden.

Op organisatorisch niveau fungeerde het bestaande Regionaal Overleg Acute Zorgketen (ROAZ) als platform voor discussie en besluitvorming tussen bestuurders en beleidsmakers. De landelijke overheid stimuleerde deze overlegorganen om verantwoordelijkheid te nemen voor hun eigen regio.

Wat waren faciliterende en belemmerende factoren voor samenwerking?
De respondenten noemden veel factoren die tijdens de coronacrisis een positieve invloed hadden op de samenwerking tussen acutezorgorganisaties, zowel klinisch en professioneel als op systeemniveau. Er waren duidelijke afspraken over werkprocessen, men had vertrouwen in elkaars werk en zorgverleners groeiden dichter naar elkaar toe.

Er waren echter ook barrières op het organisatorische en communicatieve niveau, zoals inmenging in elkaars werk en gebrek aan duidelijk beleid. Sommige zorgverleners gaven aan dat ze op de werkvloer weinig contact hadden waardoor de drempel om hulp te vragen soms te hoog was. Zo was er op de HAP geen dienststart waarin alle betrokkenen (verpleegkundig specialisten, huisartsen van dienst, postassistenten) zich aan elkaar voorstellen. Met name verpleegkundig specialisten gaven toe dat ze soms sneller geneigd waren een patiënt door te verwijzen naar de SEH omdat de drempel een huisarts te consulteren te hoog was. Verpleegkundig specialisten kunnen op drukke momenten huisartsen ontlasten door bijvoorbeeld een patiënt met een hechtwond over te nemen, maar dan moet wel bij alle huisartsen bekend zijn dat zij hiervoor bekwaam en beschikbaar zijn. Gezamenlijk een dienst starten of gezamenlijke nascholingen organiseren waren tips die de geïnterviewden meegaven. In de infographic zijn voor 4 thema's de faciliterende en belemmerende factoren op klinisch, professioneel, organisatorisch en systeemniveau uitgelicht (voor de complete resultaten zie ons originele artikel).



	Zorgverdeling	Communicatie	Interactie	Vertrouwen
Systeem Integratie		⊕ Bestuurlijke niveaus hebben goed contact met verzekeraars ⊕ Transitie van zorg verbetert contact ⊖ Overeenstemming post-COVID is ingewikkeld	⊕ Verzekeraars dichter bij het acute zorgnetwerk dan voorheen	⊕ "Comfortbrief" van verzekeraars ⊕ ROAZ als oog voor de verzekeraar
Organisatie Integratie	⊕ Acute zorg gecentraliseerd ⊕ Delen van personeel ⊕ Meer dan genoeg patiënten, geen noodzaak om te concurreren ⊕ COVID-19-crisis opende een nieuwe dialoog	⊖ Dubbelzinnigheid definitie COVID-19 verdachte ⊖ Opzetten C-HAP in ZH1, eenzijdige beslissing ⊖ Geen duidelijk beleid en communicatie richting de ziekenhuizen vanuit de verschillende verpleeghuizen ⊖ Interferentie in elkaars zaken (uitstroom)	⊕ ROAZ als goed platform voor discussies	⊕ Frequent contact verbeterd vertrouwen, transparantie in de ROAZ ⊕ Inspanningen van andere organisaties zien ⊖ Onopgeloste problemen-zorgen voor wantrouwen
Professionele Integratie		⊕ Gemakkelijk toegankelijk ⊕ Goede plek om feedback te delen	⊕ Veelvuldig contact ⊕ Maken van gedeelde protocollen	⊕ Was aanwezig
Klinische Integratie	⊖ Long vs. interne geneeskunde: wie zorgt er voor Covidpatiënten?	⊕ Duidelijke afspraken over werkprocessen ⊕ Gemeenschappelijke start van de dienst op de HAP ⊖ Geen structureel feedback-moment op de HAP ⊖ Uitstroom nog steeds moeilijk, geen centraal aanspreekpunt ⊖ Gebrek aan toegang tot EPD	⊕ Begrip voor elkaars uitdagingen, waardering ⊕ Positieve werkomgeving ⊕ Leercurve ⊖ Gebrek aan gedeelde trainingen en activiteiten	⊕ Verbeterd door verhoogde interactie eerstelijnszorg

Welke veranderingen in de samenwerking zijn wenselijk om de toegankelijkheid van de acute zorg te verbeteren?

Een van de veranderingen die werden geopperd, was op de HAP een vaste groep huisartsen te laten werken, zodat die korte lijntjes kunnen opbouwen met het verdere personeel van de HAP en de specialisten van het ziekenhuis. Deze groep zou dan het aanspreekpunt kunnen zijn voor huisartsen die minder vaak op die post werken. Veel van onze respondenten, zowel in de eerste als in de tweede lijn, zouden graag zien dat de anderhalvelijnszorg binnen het acutezorgnetwerk ook na de coronacrisis wordt gecontinueerd, en dat het erg nuttig zou zijn om ook specialisten ouderengeneeskunde en psychiaters daarin op te nemen. Sommigen gingen nog een stap verder en droomden van een gemeenschappelijk loket voor acute zorg, maar sommige organisaties vonden het een stap te ver gaan als de huisartsencoöperatie alle diensten zou bundelen in 1 acutezorgorganisatie.

Deelnemers wilden vooral betere integratie van de elektronische patiëntendossiers (EPD's) en zouden ook meer willen investeren in digitale oplossingen voor triage en consultatie. Andere wenselijke maatregelen die door meerdere deelnemers genoemd werden, betroffen investeringen in interprofessioneel onderwijs, bespreking van calamiteiten samen met alle betrokken organisaties en voortzetting van de structurele overleggen tussen professionals na de coronacrisis.

Beschouwing

COVID-19 heeft alle stakeholders binnen acutezorgorganisaties (waaronder huisartsen) op scherp gesteld en de integratie van acute zorg in sommige aspecten versneld. Ons onderzoek laat zien dat betere integratie ook binnen de veelheid van acutezorgorganisaties mogelijk is wanneer alle organisaties het gevoel van urgentie en onderlinge afhankelijkheid delen. Voor een goed geïntegreerd acutezorgnetwerk zijn op alle niveaus verbeteringen nodig. We hebben een aantal faciliterende en belemmerende factoren geïdentificeerd die aangepakt kunnen worden. Een voorbeeld is de anderhalvelijnszorg op de COVID-HAP, waarvan onze respondenten graag zouden zien dat die permanent werd. Anderhalvelijnszorg wordt al veelvuldig toegepast in de dagpraktijk, maar kan dus ook in de acute zorg een nuttige bijdrage leveren.

Op organisatorisch niveau waren er veel factoren die de integratie belemmerden. Voorbeelden zijn de dubbelzinnigheid van de definitie 'COVID-19-verdacht', gebrek aan duidelijk beleid en communicatie tussen ziekenhuizen en verpleeghuizen, verkeerde afstemming van prioriteiten tussen de verschillende organisaties of onopgeloste problemen die leiden tot wantrouwen. De geïnterviewden noemden allerlei praktische mogelijkheden om deze barrières te slechten, zo zou een dienstopening op de HAP de drempel wegnemen om elkaar om hulp te vragen.

Functionele barrières, zoals het ontbreken van een gedeeld of open EPD en het gebrek aan adequate financiering, zijn tijdens de pandemie niet opgelost. Dit riep bij de geïnterviewden de vraag op of de nu gerealiseerde extra integratie van acutezorgorganisaties de gezondheidscrisis zal overleven.

Een beperking van ons onderzoek is dat het een verkennend onderzoek was met slechts 1-2 stakeholders per niveau per organisatie. Verder is de validiteit van onze vragenlijst niet zeker vanwege het lage aantal antwoorden en het ontbreken van significante verschillen tussen de 3 uitgevraagde perioden. De vragenlijst was echter slechts bedoeld als basisoverzicht en de uitkomst is daarom ondergeschikt aan de kwalitatieve resultaten. Een laatste beperking is dat het onderzoek is uitgevoerd in een stadsregio met een veelvoud aan

acutezorgorganisaties, wat tot versnippering kan leiden. De resultaten kunnen in andere regio's dus heel anders zijn.

Meer onderzoek naar de integratie van het acute zorgnetwerk is nodig, op grotere schaal, in verschillende regio's en met meer betrokken stakeholders per organisatie. In dat onderzoek zou ook het patiëntenperspectief aan bod moeten komen.

Conclusie

De drijvende kracht achter de gegroeide samenwerking tussen acutezorg-organisaties tijdens de coronacrisis leek een groot, gedeeld gevoel van urgentie te zijn om de beste patiëntenzorg te kunnen bieden. Ons advies is om na de coronacrisis de focus te verleggen van het overwinnen van de crisis naar het overwinnen van uitdagingen in de samenwerking tussen verschillende acutezorgorganisaties.

Chapter 6

Reforming healthcare in the Netherlands: practical Population Health Management and the Plot model

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Abstract

Background As in many other countries, the Netherlands is facing challenges in the provision of healthcare to its population. To ensure the population remains in good health in coming decades, an integrative approach to the many factors that influence health and health outcomes is needed. Population Health Management (PHM) is gaining interest as a strategic framework for systems change in healthcare organisations. Based on PHM, the Dutch HealthKIC has developed the 'Plot Model', which takes a regional perspective. The aim of this study was to detail the extent to which six prospective regions in the Netherlands were ready and willing to implement PHM using the Plot model, guided by the Five Lenses Model.

Methods Using an exploratory mixed-methods questionnaire survey and qualitative focus group meetings, we involved stakeholders from six regions in the Netherlands. Thematic analysis followed the five predesigned dimensions of a validated cooperation model.

Results The study uncovered the potential for realisation of model aims, as assessed by an expert team, regarding shared ambition, mutual gains, relationship dynamics, organisational dynamics and process management. The exploratory questionnaire suggested that organisational dynamics is the least integrated topic in all areas, followed by process management, a finding confirmed in focus groups.

Conclusion The building themes of the Five Lenses Model all represent preconditions for the success of integration in the prospective regions. The present study showed that while some themes were reasonably represented in prospective regions, no region was satisfactory for all themes.

Background

Like many other countries, the Netherlands faces challenges in healthcare provision to its population. According to the National Institute for Public Health and the Environment (Dutch abbreviation RIVM), increases in healthcare expenditure are expected to continue until at least 2060, despite the population reaching its age peak around 2040. If current policies continue, healthcare expenditures will grow by an average of around 2.8 percent per year and one in three employees will be working in healthcare by 2060. [1, 2] The bulk of the costs are related to hospital care (96 billion), while mental healthcare costs are predicted to increase by a factor of five. [1] Population age structure has been changing since the 1960s and as the population continues to age, the burden on a shrinking working force increases, a group which plays a significant role in supporting the well-being of an aging population. [3, 4] The complexity of these challenges is further increased by the need to offer high-quality care to a demanding population while keeping healthcare systems accessible and affordable. [5, 6] To ensure people remain in good health in the decades to come, new vision is needed regarding how the current healthcare system is organised and incentivised, and how people are directed through the system. To improve outcomes across the entire healthcare system, a transformation is needed from a reactive, curative 'Disease and Cure' approach to a more proactive, preventive societal 'Health and Wellbeing' perspective. This will require an integrative approach that weaves together the many factors that influence health and health outcomes. [5-8]

A comprehensive international population health-value perspective has previously been summarised in the so-called Triple Aim. Triple Aim defines the improvement of a healthcare system as the simultaneous pursuit of three linked aims: improving the individual experience of care, improving the health of populations, and reducing growth in healthcare costs.[9, 10] The experience of care professionals also plays an important role and addressing the needs of this group adds a fourth policy aspect, which increasingly results in the formulation of 'Quadruple Aim' healthcare reform initiatives. [7] To help achieve the Triple Aim, Population Health Management (PHM) is one strategy that providers- and financiers of healthcare can use to guide systems change. PHM interventions do not focus on the single patient but rather on an entire population or subpopulation, usually defined by a geographic area or population segment and based on complex risk assessment strategies across the complete care continuum. [11] PHM thus refers to the large-scale transformation required for the reorganisation and integration of different services at all levels of integration. These efforts cover public health, healthcare, social care and wider public services with the aim of improving outcomes, and are summarized in what is

now referred to as the Triple Aim. [12] This population health-value perspective differs from other perspectives such as Value-Based Healthcare (VBHC) in that the sustainability of healthcare has an additional societal aspect. VBHC strives for the optimization of service delivery for a specific group of patients in a limited network of providers or focuses on a specific function of the system such as funding. [13, 14] These alternative perspectives have provided important lessons, including 1) a high risk of 'waterbed effects' (i.e., improvement to one part of the system has a detrimental effect on another part) and 'wrong pocket' problems (efficiency gains are collected by unintended parties), both of which are associated with interventions that fail to address the full complexity of a system, 2) the monitoring and reimbursement systems elicit a strong focus on repair instead of prevention, 3) a lack of organisational command and investment for system change, and 4) vested interest 'within silos' that block innovation across an entire system. [15] While important in themselves, initiatives other than the Triple Aim do not recognise the mutual dependencies between the financing, governance and partitioning of preventive, curative, chronic care and related services regarding health and health spending.

The concept of PHM is still developing and improved definitions emerge regularly. Studies that describe various elements of PHM implementation also appear regularly. [16] [17, 18] Nevertheless, the most important elements in the implementation process are still ill-defined. Benefitting from national and international experience, including that of examples such as Gesundes Kinzigtal, Kaiser Permanente, Basque Country, Maryland, and Massachusetts, [19, 20] the Dutch NGO 'HealthKIC' has now taken on the task of understanding the PHM framework in action. This NGO has developed the so-called 'Plot model' (Dutch: 'Kavel model') that takes a regional perspective and is founded on three pillars: a new approach to organising differently around one accountable regional body, a different payment and finance model that stimulates health instead of healing, and a different approach to monitoring that includes health as well as costs and resources. Since these changes are complex, the context in which they take place is of the utmost relevance. The success or failure of implementation of a PHM strategy will be determined by the specific circumstances within which it is carried out. [20] Imperative for successful change is willingness, propelled by trust in PHM, concerning the transition process and between organisations in the specific region that plans to implement PHM.

When evaluating the integrative processes needed to successfully launch PHM implementation in a specific region, the 'Five lenses on cooperation model' offers a conceptual framework based on the premise that optimal integration requires an integral approach, based on five balanced themes as visualised in figure 1. [21] The five closely connected themes are: 1. Shared ambition (shared

commitment of the organisations), 2. Mutual gains (a dialogue about underlying interests of partners that provides an ideal win-win solution), 3. Relationship dynamics (good personal relationships among the partners that contribute to successful integration), 4. Organisational dynamics (appropriate organisation and adequate arrangements), and 5. Process management (process steering among the partners). [21, 22]

The aim of our current exploratory mixed-methods study is to provide a description of the willingness and readiness of six prospective regions in the Netherlands to implement PHM using the Plot model and guided by the Five Lenses Model.

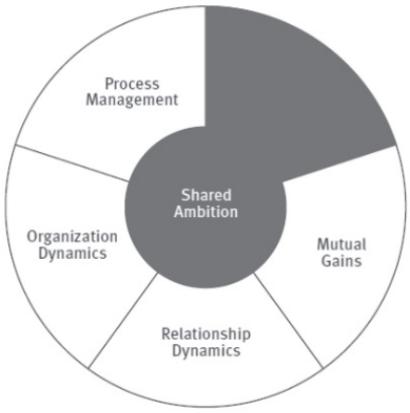


Figure 1: Five lenses on cooperation by Bell and colleagues

Methods

Procedure

This exploratory mixed-methods study was performed between June and August 2020 and involved six prospective regions within the Netherlands interested in implementing PHM. Based on knowledge acquired during a preceding selection process, a key stakeholder was identified per region. This key stakeholder was often the coordinator or chairperson of existing collaborations at the executive level between the main regional healthcare organisations. This key stakeholder was asked to provide a list of the other main executive level stakeholders involved in regional initiatives. These could be, for example, stakeholders at a hospital, an insurance company, a municipality, social care, education, a general practitioner (GP) practice, or a mental healthcare service. The key stakeholders were then asked to complete an online questionnaire, followed by a semi-structured focus group discussion. To describe willingness and readiness to implement PHM, we used the building themes from the Five lenses on cooperation model. [21]

Questionnaire

Approximately one week prior to the date of focus group meetings, the key stakeholders from the six prospective regions received an online questionnaire designed to provide an exploratory baseline insight into the level of integration of organisations in their region with regard to the five building blocks of the Five lenses model. The questions were further developed with the support of the Plot model team (Appendix I). The questionnaire consisted of 23 questions, including at least two questions per topic. The answer scores (4 categories) corresponded to four different stages of integration: segregated (score 1), aligned (score 2), coordinated (score 3) and integrated (score 4).

Focus group

Six focus group meetings, including the Plot model expert team (MAB, LV, and/or CV) together with stakeholders from the six regions, addressed a topic list between June and August 2020. Five focus group meetings were live and one online. Prior to each focus group meeting, the baseline questionnaire results were discussed by the expert team to gain an impression of the region. After involved parties provided informed consent and a short introduction, all focus group sessions were audio recorded. During the sessions the trained expert team led the focus groups and was careful to ensure discussion of all topics. They also explained the origin and aims of the Plot model and discussed this with stakeholders. The duration of focus group meetings varied between 81 and 97 minutes.

Data analyses

The questionnaire data were reported as means per component of the different stages of integration (scores 1 to 4) and analysed using SPSS version 21.0 (IBM Corp., 2012, Armonk, NY). The audio recorded focus group sessions were transcribed verbatim by RNM and a copy of the transcript was sent to the key stakeholder of each candidate region for approval. The focus group transcripts were coded and labelled by RNM and AFTME based on the focus group topic list, discussed with MAB and then analysed using Microsoft Excel (2016).

The results were ordered with regard to the five lenses model into two parts: 1) The explanation of Plot model aims by the expert team (MAB, LV, and CV), and 2) The willingness and readiness of prospective regions to implement PHM based on questionnaire results and stakeholder discussions of progress and limitations within each region. RNM and AFTME then discussed the analysis results with MAB. The results of the questionnaires and focus group meetings were pseudonymised. The study was registered and approved by the medical research ethics committee of Leiden University Medical Centre (LUMC), N20.197.

Results

The designated key stakeholder per region completed the questionnaire and recruited a number of other regional stakeholders for a focus group meeting (table 1).

Table 1: included stakeholders in the focus groups per potential Plot

Potential Plot	Number of stakeholders	Involved stakeholders in a focus group
1	Seven	a councilor, a youth mental healthcare service administrator, a GP, a teacher, a hospital administrator, a home care and nursing home administrator and a healthcare insurer
2	Nine	two GP's, a medical specialist, two hospital administrators, a home care and nursing home administrator, a public health director and two healthcare insurers
3	Six	a mental healthcare service administrator, a hospital administrator, a GP partnership administrator, a civil servant, a social work administrator and a manager of a positive health platform
4	Five	a councilor, a civil servant, a housing association director, a chairman of the social domain and a primary care center director
5	Four	a municipal health service adviser, a GP partnership administrator, a hospital administrator and a home care and nursing home administrator
6	Six	a home care and nursing home administrator, two councilors, a GP partnership administrator, a mental healthcare service administrator and a healthcare insurer

GP: General Practitioner

Questionnaire

The results of the exploratory questionnaire give some insight into the level of integration of organisations across the various regions of the Netherlands with regard to shared ambition, mutual gains, relationship dynamics, organisational dynamics and process management. However, the questionnaire was only completed by one key stakeholder per prospective region. Organisational dynamics (such as sufficient financial resources) seems to be the least integrated topic across all regions, followed by process management (structural monitoring, shared data infrastructure and plans to build shared data infrastructure) (table 2).

Table 2. Questionnaire results

N=6	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
Shared ambition; mean	3.00	3.50	4.00	2.00	4.00	4.00
Mutual gains; mean	2.57	3.14	3.71	2.29	3.00	3.43
Relationship dynamics; mean	3.25	4.00	3.75	3.50	2.75	3.75
Organisational dynamics; mean	1.00	x	1.00	x	2.20	2.20
Process management; mean	2.00	x	2.00	x	2.40	3.40

The mean scores correspond with different stages of integration with 1 meaning completely segregated, 2 aligned, 3 coordinated, and 4 completely integrated. X=missing data

Focus groups

Topic 1: shared ambition

1) Explanation of Plot model aims

To launch the large-scale transformational process required for the reorganisation and integration of different services it is necessary to have a shared ambition to shift the main focus from illness to health. The current Dutch healthcare system is structured around curing illness and the efficient delivery of care rather than the premises of health promotion and disease prevention. In contrast, the Plot model builds on the premise that health is more than just the absence of illness and a shared ambition to implement this vision acts as a compass for all cooperative stakeholders. The ambition of the Plot model creators is that organisations from sectors such as healthcare, social care, housing and other partners in a geographically demarcated prospective region embrace a single vision of transformation to a more Health and Wellbeing-focused perspective. Commitment is needed from all involved organisations within the prospective region to confront challenges such as mounting healthcare expenditure, an ageing population and a shrinking workforce. A primary goal is a greater focus on the health process after someone has been treated and discharged from hospital.

2) Willingness and readiness of prospective regions

During focus group meetings all stakeholders agreed with the ambition of the Plot model for a greater focus on health. They underlined the importance of involving all the various organisations in their region to tackle this challenge together (quote 1). Four of the six prospective regions had already drawn up a regional vision focusing on health in which this specific ambition had been documented by many organisations concerned. In one prospective region, around 30 involved organisations had begun by mapping out the challenges they would face when continuing to provide good healthcare in 2030. At the core of this regional vision is a desire to organise care across organisational and systemic boundaries, focusing more on Health and Wellbeing and less on Disease and Cure, the primary focus at this moment. Two prospective regions had not yet drawn up a regional vision, one of which found the transition to a greater focus on healthcare attractive but had not taken further concrete steps, while the other indicated that various regional organisations were interested in working together and are setting up projects, but still lack an overall regional vision. Even when a vision had been formulated, how action should follow ambition often remained unclear (quote 2). Resolving this issue requires many ingredients from other components of the Five Lenses on Cooperation Model, among which commitment is an important example. Everyone agreed that for the transformation to succeed, greater commitment would be needed (quote 3). Indeed, all prospective regions concurred that the time for transformation

is now, as staff shortages, an aging population and increasing chronic disease all underline an urgency that is greater than ever (quote 4).

Quote 1: "I believe that we are socially obliged to do this together. Time is an important factor, time and commitment. It is very important to provide long-term, mutual support regardless of management changes, etc. If we can achieve this together it will be very exciting and very economically advantageous. But also very challenging."
Quote 2, Manager Primary Care: ''I notice that there is still insufficient substance to the stated vision. We have all made statements but to really achieve something...; it is still difficult to get everyone on board and take action. There seems to be a lack of mutual responsibility.''
Quote 3, Board of Directors elderly care organisation: "And I find that a little nerve-racking; you trade a degree of autonomy and you take a business-economic risk, because if things go well, you might have less income; it's important to ensure that it doesn't become a huge bureaucracy, so governance discussions are key. An incredible amount of commitment is needed."
Quote 4: ''The urgency is now greater than ever, the labour market, an aging society, chronic conditions..''

Topic 2: mutual gains

1) Explanation of Plot model aims

According to the expert team the aim of the Plot model is to create a system in which courage, leadership and regional willingness are matched with system infrastructure. Building on shared ambition, one common reason for failure is that the interests of the individual organisations are not well served, so it is imperative that stakeholder's interests are served to an acceptable level. This requires the stakeholders to interact intensively. Different organisations within the prospective regions must think about and agree on how to organise health and care differently or how professionals can provide health and care differently. The organisations also need to consider how turnover and costs can be reduced. Another important element in PHM implementation is therefore an integrated cross-domain business model for health and social care. This means that, for the population in a given region, the costs and revenues resulting from different financial streams are aligned and the consequences for all regional stakeholders are transparent. This also means that certain organisations are critical to the overall success of the model: (1) the healthcare insurer which manages mutual cost savings and contracts, (2) the municipality, and (3) the population of the prospective region which decides whether they support the changes, whether there is a genuine shared interest and whether they find it interesting. The expert team also believes the public or local community should participate. Collaboration creates an idea of 'stronger together', but a degree of

autonomy is also surrendered. Loss of autonomy and expansion of cooperation must thus be acceptable within a region.

2) Willingness and readiness of prospective regions

All six prospective regions agreed with the statement that mutual gains are a prerequisite to achieving a successful transition. This perspective creates a joint mission in which organisations relinquish a degree of autonomy in order to work together. They also all agreed that organisations should commit to working together long-term in order to reduce the production incentives together (quotes 5 and 6). Getting colleagues on board and taking action has proven difficult, as stakeholders from the various organisations often failed to recognize their common responsibility (quote 7). Three prospective regions mentioned that there is still some uncertainty regarding how the healthcare insurer in their region views the Plot model (quote 8). They would like the healthcare insurance company to join the discussion in order to ensure that all organisations affected by the transformation experience a soft landing financially; they thus need to have confidence in their future financial position in advance. An example of the tensions elicited by mutual gains in previous projects with a focus on positive health is that changes sometimes resulted in fewer patients being referred to hospital (a success), but as no strategy was in place to address the loss of hospital revenue, this success was often labelled a failure (quote 9). Something that is repeatedly emphasized is that the various parties wish to share common goals but have difficulty developing sufficient mutual trust (quotes 9, 10 and 11). Tension is common due to the fear that little action will be undertaken, resulting in a vision that is not practically purposeful. Investing in building mutual gain is therefore vital to any successful transition.

Quote 5: "Production targets and invoicing are such a part of our system, you have to take the necessary time and arrive at long-term agreements together in order to give this a chance of success, a chance for behavioural change to be successful."
Quote 6, hospital board of directors: '' If the vision actually involves a fall in hospital income, which I don't necessarily believe, but I'm not in denial about it either. If you're talking about a 10-year period and activities that are actually going to decline; well yes, if you see it coming well in advance and can use natural wastage to avoid replacing a surgeon, for example, then it could work because we also have labour market problems. Given sufficient time it's certain possible."
Quote 7, healthcare professional: "That's difficult, isn't it, because our primary goal in hospital is our task as hospital; that is what we do. And we do it well, but our task is not to do things that are not our task, and then the question is whether these things will be done by someone else. I hear that this is not always the case."

Quote 8: ''We are dependent on healthcare insurers and whether they are willing to support the things we have in mind. If they don't wish to participate, we have to explore other financial options."
Quote 9, Director of public health: "I have a question about, for example, a previous project called ''more time with the doctor", which means less hospital referral with potential financial difficulties for the hospital; these are examples that you should also talk about because if you're really talking about a paradigm, it will affect the entire chain. ''
Quote 10, hospital board of directors: ''You can't have too many leading organisations; those organisations all have their own demands''
Quote 11, ''We really have to avoid a situation in which we all commit but circumstances result in general disappointment. That others say 'nice that you have shown that you can manage with less, but we'll take over now, thank you and good luck'. That is of course fatal for a movement like this.''

Topic 3: relationship dynamics
1) Explanation of Plot model aims
According to the expert team, an absolute precondition is that all involved organisations in a potential region are ready and willing to work together in a new way. Stakeholders should be able to find a satisfactory balance between their commitment to cooperation and their own organisational needs. For example, the working culture within a collaboration may be different to that of their organisation. An important factor here is leveraging existing positive energy amongst those who can effectively span existing boundaries, the so-called boundary spanners. Boundary spanners work at and manage the boundary between the various groups and organisations, while helping to cultivate individuals or organisations. Attention to individual, personal and relational aspects of cooperation are important, and programs aimed at cultural change are essential to the successful transformation and collaborative reorganisation of healthcare. At the outset, organisations tend to agree that positive health is important, but it is critical that organisations also discuss their approach to future complexities in advance. It is important that organisations are able to communicate with each other, that they can count on each other's support and take the next steps together. This applies even after personnel changes following municipal elections, when a completely new council is elected or when changes occur among hospital directors.

2) Willingness and readiness of prospective regions
All prospective regions already had good connections with other organisations within their region. However, a mutual connection to focus on positive health was not yet established, regardless of whether a vision had been formulated (quote 12). Trust is an incredibly important building theme within the Five

Lenses on Cooperation Model, and it was apparent that greater trust was needed in all cases. While good connections were in place, there were also doubts as to whether the right organisations were involved and concerns regarding the lack of long-term relationships. For instance, there was little or no relationship with the insurer in some cases, and three prospective regions commented that the healthcare insurer did not play an active role in their region, while one region described the relationship with the health insurer as very complex (quote 13). Furthermore, all prospective regions indicated that the will to cooperate was often present, but that there was still a need to focus on cultural change.

Quote 12: ''Positive health as a prevention model is wonderful; the only thing missing is an overarching organisation or the so called boundary spanners.''
Quote 13: ''The relationship with the healthcare insurance company is extremely difficult. Whenever we meet we are literally and figuratively sitting opposite each other rather than next to each other.''

Topic 4: organisational dynamics
1) Explanation of Plot model aims
According to the expert team, many health-focused projects are initiated in the Netherlands but frequently receive only temporary subsidises. Especially in cases where a domain is overarching, it is rarely a good fit with current funding structures. As a result, many projects and programmes end when the funding stops. Another problem is that organisations are currently judged primarily on short-term cost-related gains and not enough on prevention and stimulating health. The Plot model is designed to remove these obstacles via alternative forms of organisation, finance and monitoring. Another goal of the Plot model is to create an external fund with which prospective regions can finance health interventions aimed at curbing rising healthcare costs. Via shared cost savings, the prospective region can repay the investor and create a revolving fund, which frees up structural funding for organisational consolidation. Effective monitoring of interventions is therefore important in order to properly visualize shared cost savings. Another important element of PHM implementation is the ongoing use of data-driven insights to drive PHM interventions. PHM strives towards trusted and increasingly sophisticated performance measurement as a guide for targeted interventions in regional healthcare systems. The expert team would like to see room for meaning and participation, as well as for conscious choices among specific target groups or for specific challenges within a prospective region. They consider the Plot model a growth model that can initiate one or two area-specific themes per prospective region. To this end, the organisations involved in the prospective region are making a business case that covers plans for the next decade. Together these organisations form the integrator and take joint responsibility.

2) Willingness and readiness of prospective regions

Three prospective regions wished to improve organisational strength in order to help realize goals (quotes 14 and 15), as well as stating that they seek cohesion in order to kick start collaboration (quote 16). Issues of lack of competence regarding taking action and a need to link capacity across integration levels indicated a need for boundary spanners (quote 17). Several prospective regions underlined their need for greater organisational strength through illustrative examples of interventions or themes they wish to address. One prospective region mentioned that they would like to focus on better follow-up treatment for their patients, such as treatment at home following a hospital-based oncological treatment. Another prospective region indicated that many dedicated workers in their region may need further education. They will begin thematic education during the next academic year and hope to launch prevention by introducing a cultural change aimed at promoting health amongst young adults (quote 18). All prospective regions face a challenge at the organisational level concerning surrender of autonomy, a change that requires a great deal of genuine commitment (quote 19). It also remains unclear which and how many organisations need to be involved to ensure a successful transition (quote 20).

Quote 14: ''I also want to increase organisational strength to really do things differently or to approach things differently. This is a very important component. Knowledge is not the problem, but organisation and everything that goes with it is not the strongest aspects of care in my experience.''
Quote 15: ''We have to try something new, otherwise we will keep going in the same circles as we have been doing for years. We worked on this 10 years ago, made some progress but something more has to be done. A real revision is needed. We need to maintain momentum, otherwise we will be only be looking for problems and will lose the initiative. Something somewhere needs to happen now.''
Quote 16: ''In the end it is just a collection of random projects if I were to be unkind; I am not seeing coherence, especially mutual coherence, spanning organisations.''
Quote 17, Director GP organisation: ''The GP organisation really doesn't take a negative view. When it comes to the practices, there is still very limited action as regards adopting the philosophy.''
Quote 18: ''Education is very important. My older colleagues still say that the greatest health gain among fishermen was achieved by educating fishermen's wives about healthy food. This was not down to us as doctors.''
Quote 19, Director GP organisation: ''And I think that's exciting, you give away a bit of autonomy. Incredible commitment required.''
Quote 20: ''I think it depends on which organisations you bring together. Some organisations are further along than others and the chance of success depends on the organisations you choose.''

Topic 5: process management

1) Explanation of Plot model aims

According to the expert team, it is important to discuss practical details of stakeholder collaboration and to clear establish who will lead the implementation process. Plot model experts can support the process but process management must also be based within the region, so a lack of clear agreement can frustrate the cooperation process. For example, it is very important to determine who participates in the collaboration. One challenge facing the Plot model is determining how large a geographically demarcated area should be in which citizens still relate to each other, while ensuring that the population is large enough to make it financially sustainable. In general, upscaling is difficult. In the current system, finance is based on production but in order to make transformation possible and to allow the former model to be phased out, a prospective region needs a considerable portion of the investment fund. Some organisations will generate less turnover at lower cost, meaning current budget flows will be diverted. The hypothesis of the Plot model team is that longer-term investment enables the system to slowly adapt to the financing of health rather than illness. Collaboration requires momentum and process, and promising, concrete results will inspire stakeholders to proceed to the next phase of collaboration.

2) Willingness and readiness of prospective regions

However, not all prospective regions feel ready at the process management level. One prospective region suggested that first deploying specific interventions within their geographically defined region and only then applying them to the rest of the area may be the most promising approach. To date, they have been unable to properly demonstrate connections between different interventions, and many ongoing projects have no evidentiary value. Two other prospective regions commented that they have many ongoing projects they would like to accelerate but for financial limitations. Nevertheless, there is some doubt as to whether an external fund is the answer (quotes 21 and 22).

Quote 21, a GP: ''When it comes to organising things differently, we are already doing okay but there is room for improvement. But I really believe that care finance is the bottleneck here.''

Quote 22: ''a number of projects have already proven themselves and we really want to continue them, but we sometimes see resistance from the municipality, health insurer or other organisations. I think that's where the fund could be of enormous benefit in really getting things going. So that projects can become structurally sustainable. In my opinion there is a very great need for a fund of this type.''

Discussion

This exploratory mixed-methods study provides a description of the readiness and the willingness of six prospective regions in the Netherlands concerning implementation of PHM via the Plot model and based on the Five Lenses Model.

The Five Lenses Model highlights important themes to consider during the selection phase of a complex integration process. Integration requires a coherent set of methods to create connectivity, alignment and collaboration within and between different organisations. Efforts to promote integration for the benefit of patients with complex long-term problems, cutting across multiple services, providers, and settings, is referred to as integrated care.[23] All building themes of the Five Lenses Model are preconditions to the success of integration in the prospective regions. Our exploratory questionnaire and focus group results showed that while some themes were more or less present in all potential regions, no region had implemented all themes. Initially, all potential regions need a shared ambition (e.g. vision and mission of the collaboration) [22] and many regions had indeed already drawn up a regional vision. The topic of mutual gain revealed that it is still difficult to coalesce the entire group of stakeholders, as stakeholders from the various organisations did not feel a common responsibility. In terms of relational dynamics, many connections were very good, but with an ongoing need to focus on cultural change, boundary spanners and mutual trust. It was felt that competence to undertake action right away was lacking, and better organisational strength and knowledge concerning process management would be needed to really do things differently. Previous studies nevertheless show that there is a drive to roll out innovative models of healthcare globally, and the importance of being ready and willing to develop and progress new integrated models of care is reinforced by experience. Some of the key learning points from previous examples of innovative integrated care models include: 1) relationship building, including a capacity to build bridges, is key to intraorganisational and interorganisational working, 2) relationship dynamics appear to have a significant effect on the final success of a partnership, 3) a mutual gains approach at baseline (e.g. explicitly voicing the interests of the various partners) is a precondition for a successful partnership, 4) the importance of investment to support transformation efforts, and 5) previous transformation initiatives offer valuable lessons for new initiatives. [22, 24-32] If prospective regions takes these lessons to heart, success is not guaranteed but the chances of successful transformation are likely to increase.

Limitations

One potential limitation was the low response rate to the questionnaire, possibly suggesting that results may not be representative. However, as the questionnaire was intended as a baseline overview of the integration level in the prospective regions it is therefore secondary to the qualitative results. Another limitation was the fact that researchers could only interview a group of stakeholders selected by a key stakeholder depending on the burning platform (a specific population segment with a high risk of adverse outcomes) [9, 33], which included only one or two stakeholders per organisation. The research team therefore recommends further studies, for example due diligence research.

Conclusions

This study provided a description of the degree to which six prospective regions in the Netherlands are ready and willing to implement PHM using the Plot model and based on the Five Lenses Model. All of the Five Lenses Model building themes qualify as preconditions to the success of integration in the prospective regions. We found that while many themes were more or less present in prospective regions, no region had implemented all themes. We now recommend that, during the initial phases of a transition, greater focus should be placed on mutual interests, establishing relationships (via boundary spanners) and procuring resources for adequate process management.

References

1. RAA Vonk HH, MHD Plasmans, GJ Kommer, JJ Polder. Health care expenditures foresight 2015-2060 : Quantitative preliminary study at the request of the Scientific Council for Government Policy (WRR). Part 1: future projections. RIVM. 2020.
2. WRR. Kiezen voor houdbare zorg. Mensen, middelen en maatschappelijk draagvlak. WRR-Rapport nr 104. 2021.
3. Verwest F, Taylor P, van Wissen L, van Dijk J, Edzes A, Hamersma M, et al. Resilient labour markets and demographic change in selected regions of the Netherlands. Demographic Transition, Labour Markets and Regional Resilience: Springer; 2017. p. 73-94.
4. Nagarajan NR, Sixsmith A. Policy Initiatives to Address the Challenges of an Older Population in the Workforce. Ageing International. 2021:1-37.
5. Steenkamer BM, Drewes HW, Heijink R, Baan CA, Struijs JN. Defining Population Health Management: A Scoping Review of the Literature. Popul Health Manag. 2017;20(1):74-85.
6. Blobel B, Ruotsalainen P, editors. Healthcare Transformation Towards Personalized Medicine-Chances and Challenges. pHealth; 2019.
7. Bachynsky N. Implications for policy: The Triple Aim, Quadruple Aim, and interprofessional collaboration. Nurs Forum. 2020;55(1):54-64.
8. Johansen F, Loorbach D, Stoopendaal A. Exploring a transition in Dutch healthcare. J Health Organ Manag. 2018;32(7):875-90.
9. Stiefel M, Nolan K. A guide to measuring the triple aim: population health, experience of care, and per capita cost. IHI Innovation Series white paper Cambridge, Massachusetts: Institute for Healthcare Improvement. 2012.
10. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health affairs (Project Hope). 2008;27(3):759-69.
11. Alderwick H, Ham C, Buck D. Population health systems. Going beyond integrated care. 2015.
12. Steenkamer B, Drewes H, Putters K, van Oers H, Baan C. Reorganizing and integrating public health, health care, social care and wider public services: A theory-based framework for collaborative adaptive health networks to achieve the triple aim. Journal of health services research & policy. 2020;25(3):187-201.
13. Porter ME, Teisberg EO. How physicians can change the future of health care. Jama. 2007;297(10):1103-11.
14. Teisberg E, Wallace S, O'Hara S. Defining and Implementing Value-Based Health Care: A Strategic Framework. Acad Med. 2020;95(5):682-5.
15. al. JPe. Fiscally sustainable healthcare book. 2018.
16. Suter E, Oelke ND, Adair CE, Armitage GD. Ten key principles for successful health systems integration. Healthc Q. 2009;13 Spec No(Spec No):16-23.
17. Framework on integrated, people-centred health services. sixty-ninth world health assembly: World Health Organization; 2016. Contract No.: A69/39.
18. Steenkamer B, Drewes H, Putters K, van Oers H, Baan C. Reorganizing and integrating public health, health care, social care and wider public services: a theory-based framework for collaborative adaptive health networks to achieve the triple aim. Journal of Health Services Research and Policy. 2020;25(3):187-201.
19. Alderwick H, Ham C. INNOVATION. Look further afield to integrate care locally. Health Serv J. 2015;125(6442):19-21.

20. Steenkamer B, Drewes H, Putters K, van Oers H, Baan C. Reorganizing and integrating public health, health care, social care and wider public services: a theory-based framework for collaborative adaptive health networks to achieve the triple aim. J Health Serv Res Policy. 2020;25(3):187-201.
21. Bell J KE, Opheij W. . Bridging disciplines in alliances and networks: in search for solutions for the managerial relevance gap. International Journal of Strategic Business Alliances. 2013;3(1):50-68.
22. Valentijn PP, Vrijhoef HJ, Ruwaard D, de Bont A, Arends RY, Bruijnzeels MA. Exploring the success of an integrated primary care partnership: a longitudinal study of collaboration processes. BMC Health Serv Res. 2015;15:32.
23. Kodner DL, Spreeuwenberg C. Integrated care: meaning, logic, applications, and implications--a discussion paper. International journal of integrated care. 2002;2:e12.
24. McLachlan S, Williams R. Waluwin-an integrated approach towards health and wellbeing in Western NSW, Australia. International Journal of Integrated Care (IJIC). 2016;16(6).
25. Ilmo Keskimäki TS, Juha Koivisto. Integrating health and social services in Finland: regional and local initiatives to coordinate care. Public Health Panorama. december 2018;volume 4 issue 4.
26. Pearson C, Watson N. Implementing health and social care integration in Scotland: Renegotiating new partnerships in changing cultures of care. Health Soc Care Community. 2018;26(3):e396-e403.
27. Bruce D, Parry B. Integrated care: a Scottish perspective. London J Prim Care (Abingdon). 2015;7(3):44-8.
28. Grembowski D, Marcus-Smith M. The 10 Conditions That Increased Vermont's Readiness to Implement Statewide Health System Transformation. Popul Health Manag. 2018;21(3):180-7.
29. Stokes T, Atmore C, Penno E, Richard L, Wyeth E, Richards R, et al. Protocol for a mixed methods realist evaluation of regional District Health Board groupings in New Zealand. BMJ open. 2019;9(3):e030076.
30. Wilson P, Billings J, MacInnes J, Mikelyte R, Welch E, Checkland K. Investigating the nature and quality of locally commissioned evaluations of the NHS Vanguard programme: an evidence synthesis. Health Research Policy and Systems. 2021;19(1):63.
31. Morciano M, Checkland K, Billings J, Coleman A, Stokes J, Tallack C, et al. New integrated care models in England associated with small reduction in hospital admissions in longer-term: A difference-in-differences analysis. Health Policy. 2020;124(8):826-33.
32. Maniatopoulos G, Hunter DJ, Erskine J, Hudson B. Lessons learnt from the implementation of new care models in the NHS: a qualitative study of the North East Vanguards programme. BMJ open. 2019;9(11):e032107.
33. Whittington JW, Nolan K, Lewis N, Torres T. Pursuing the Triple Aim: The First 7 Years. The Milbank quarterly. 2015;93(2):263-300.

Additional material Chapter 6

Appendix 1: Questionnaire and focus groups topics

Topic	Question
Shared ambition	Has one joint vision been drawn up and signed by all involved organisations on the transformation from 'Disease & Cure' to 'Health & Behaviour'?
	Have the main perceived bottlenecks been identified for the transformation?
Mutual Gains	Is there already good administrative cooperation between the important organisations in your region aimed at this goal
	Is there good cooperation between the professionals at an operational level?
	Can new organisations be involved in the current collaboration in your region?
	Is the decision-making and responsibility structure of the collaboration effective?
	Is there a shared responsibility in the collaboration between professionals, organisations and sectors to achieve continuous improvement?
Relationship Dynamics	Are the interests of the organisations more taken into account in the decision-making in the cooperation in the region than the transformation objectives?
	Are the constituencies of each of the organisations sufficiently involved in the progress of the collaboration?
	Are there any successes in the field of positive health to be reported?
	Is there a densification of the network by means of increase in the number of organisations?
	Is there a densification of the network by means of increase in the number of activities?
	Have concrete activities already been carried out in practice as a result of this collaboration?
Organisational Dynamics	Does the partnership have its own financial resources?
	Are these financial resources sufficient and sustainable for program coordination?
	Are these financial resources sufficient for program coordination?
	Are the long-term finances secured enough for the transformation in your region?
	Are all the different organisations in the partnership aware of each other's financial challenges?
Process Management	Is the progress of the collaboration and activities monitored?
	Is this monitoring incidental or structural?
	Is there a shared data infrastructure?
	Are there any plans to build this structure?
	If the progress is disappointing after monitoring, are the involved organisations held accountable for this?

Chapter 7

General discussion

The main objective of this thesis is to find clues how and where acute care in the Netherlands can be improved at all integration levels. Insight into the various mechanisms should enable us to maintain accessibility of acute care for all citizens in the future. The urgency to improve acute care in the Netherlands and keep it sustainable for the future is an ongoing subject for debate. The Minister of Health, Welfare and Sports presented the 'Charcoal sketch Acute Care' to the House of Representatives in July 2020. This is a discussion document aiming to ensure that acute care of the best quality is, and remains, available for all Dutch inhabitants. The main question in this charcoal sketch is how urgent problems in acute care can be solved, while at the same time keeping confidence in the ability to organise acute care for everyone. [1] In this chapter, we describe and discuss the main findings presented in this thesis, as well as roadmaps towards areas for future exploration.

Main findings

While the accessibility of acute care organisations is currently under pressure, and one way to improve services potentially, is better integration, an adequate methodology to provide a clear and accessible evaluation of various intervention initiatives was missing. We therefore developed a methodological framework for evaluating transitions in acute care services in the Netherlands to achieve Triple Aim, which we presented in **Chapter 2**. This methodological framework facilitates the evaluation of various intervention initiatives in acute care organisations in the Netherlands. Previous literature showed several general conceptual evaluation frameworks that focus on the integration of care services [2, 3], but these do not explicitly emphasise acute care organisations. One of the more interesting approaches that uses a multi-stakeholder perspective and focuses on more than just clinical or organisational outcomes is the Triple Aim approach, first described by Berwick, Nolan, and Whittington in 2008, which we decided to develop the framework. [4] These authors state that a data-driven population approach with multi-stakeholder collaboration at all levels of care is necessary to create value in healthcare, replacing volume as the primary driving issue. Unfortunately, a systematic review of literature on the Triple Aim framework in the context of healthcare concluded that providers generally struggled due to a lack of guidance and an absence of composite sets of measurements that allow performance assessment. [5] We filled this gap for acute care organisations by developing the in Chapter 2 proposed methodological framework. This framework include five steps and came out of merging the key elements of three concepts: 1) Triple Aim and learning System, 2) Integrated care and 3) Population Health Management (PHM). To help achieve the Triple Aim, these concepts can be helpful as a strategy to guide systems change.

In a region of the Netherlands, the general practice cooperative (GPC) and ambulance service have begun to integrate their care, and the rapid and complete transfer of information between these two care organisations is now the basis for delivering appropriate care. Now when a patient with an acute care need calls the GPC and the triage outcome indicates that an ambulance ride is required, a digital merger ensures that a report of findings and previous history is sent to the ambulance service via a secure e-mail service. With the help of our methodological framework, we evaluated this digital merger project to improve functional integration. The result of this evaluation we present in **Chapter 3**. The purpose was to determine the added value of merging medical data from ambulance services and GPCs, especially focusing on acute care users with the highest risk for adverse outcomes. Regarding the population health aspects of the Triple Aim, which in this context is healthcare use in a specialist setting, we noticed that the digital merger was potentially beneficial with a reduction in admission to nursing homes and fewer Emergency Department (ED) costs per patient calculated, based on reference prices in the 30 days following the acute care request compared with patients in the control period. Patients in the intervention period were responsible for generating more costs at the GPC. A shift from intramural to extramural, or from hospital care to care in the community, institutions, and general practices, may be underway and deserves further investigation. Earlier studies have reported conflicting results regarding the effectiveness of care coordination services, with variation probably attributable to differences in the intensity and duration of services. [6] An evaluation of participation in an ED-initiated community-based program reported significantly fewer ED visits and significantly more primary care visits.[7] Since ED care is more expensive then primary care, it appears that the potential cost benefits of the program are significant. [7, 8] Besides population health and costs, overall satisfaction of patients with the acute care organisations was very high. The experience of care professionals also plays an important role and addressing the needs of this group adds a fourth policy aspect, which increasingly often leads towards the 'Quadruple Aim' to be reached in healthcare reform initiatives. [9] Regarding current satisfaction we measured, the care professionals were generally fairly satisfied with cooperation to date. However, we noted major differences between the various professions, with the most satisfied group being the GPC call handlers. Focus group comments cast some light on differences in satisfaction, which seemed to be often linked to issues such as a lack of understanding of the logistical details of digital transfer. Joint trainers and courses were suggested to improve collaboration, as well as more frequent meetings to gain a better understanding of each other's work. Other studies have reported fewer positive results concerning collaboration, but arrived at similar conclusions. Our results are in line with a Norwegian study reporting that smooth cooperation between

GPs and ambulance personnel requires that both parties better understand each other's procedures and roles. [10] Our results provide an early indication of the considerable promise of medical data merging.

Patients, or citizens in total, should not be skipped when studying the subject of future-proofing acute care. The users of acute care, always are the reason why further quality improvement is pursued in the first place. Therefore, we did a qualitative interview study among patients in the acute care in an urban region in the Netherlands, which we present in **Chapter 4**. Our study provides insight into the motives for hospital self-referral during office hours and into the barriers deterring GP consultation with a presumably clear primary care oriented request. In the Netherlands, patients with an acute care request during office hours can consult a GP or, when a request is very urgent, they can call an emergency telephone number (112). Nevertheless, some patients, so called self-referrers, go directly to the ED without first consulting a GP. [11] Self-referral often results in the improper use of an ED due to a care request that in retrospect could be better treated in a primary care setting. [12, 13] A total of 44 people who self-referred were interviewed in two hospitals. People who self-referred generally reported several motives for going to the hospital directly. Information and awareness factors played an important role, often related to a lack of information regarding where to go with a medical complaint. Suggestions regarding a hospital visit are often due to a lack of familiarity with the transition of EDs over the past decennia from a 'first aid post for accidents' to specialized hospital departments. [14] In the past many patients, especially in the context of bigger cities, grew accustomed to 'accident departments' in the hospitals they live close to and this popular concept is still noticeable in many interviews. Previous questionnaire or interview studies of people who self-referred at an ED focused only on motives, ignoring information factors. [15-17] Furthermore, many people who self-referred, mentioned hospital facilities, convenience and perceived medical necessity as motivational factors. Barriers deterring a visit to the own GP were mainly logistical, including not being registered with a GP, the GP was too far away, poor GP telephone accessibility or a waiting list for an appointment. A relationship between GP accessibility and the number of people who self-referred has been described in earlier literature.[12, 18] The wide variety of motives and barriers among people who self-referred attending hospital indicates that there is no straightforward solution. However, better provision of information could be a first step in increasing health literacy and reducing misconceptions. By setting up interventions for specific target groups such as migrants, expats and young males, we will eventually approach our goal of providing 'the right care to the right patient in the right setting'.

Until now, the ED, ambulance service and GPC have come to the fore in the discussion of our findings, but acute care organisations in the Netherlands use to encompass more than these. After a patient receiving assistance at an ED or GPC, a patient can be hospitalized, referred to a nursing home, referred to an acute mental health service, receive care at home if necessary, or be referred back home without home-care. [19] What happens with a patient after treatment, depends on age, medical conditions, social context and the quality of their home. [20, 21] Dutch citizens are required to have a basic health insurance package to guarantee the quality of care, leading to insurance companies having substantial influence on the network's organisation and function as well. [22] Due to the large number of organisations involved, there are multiple entrance and exit routes for patients in the acute care network. In order to be able to continue providing high-quality healthcare, it is important that organisations are well integrated and effective communication and coordination between all stakeholders at different levels of an organisational structure is crucial. [23, 24] The objective of our study presented in **Chapter 5** was to gain an understanding in to which extent cooperation within an urban acute care network in the Netherlands improved, during and/or due to the COVID-19 crisis. In this study we identified themes that may act as barriers or facilitators to cooperation: communication, interaction, trust, leadership, interests, distribution of care, and funding. During the crisis many facilitators were identified at clinical, professional and system level such as clear agreements about work processes, trust in each other's work, and different stakeholders growing closer together due to the pandemic circumstances. However, at an organisational and communicative level there were many barriers such as interference in each other's work and a lack of clear policies. Previous studies like Suter *et al.* determined principles of integration, such as the need for a population health focus in which an integrated healthcare system should be easy for patients to navigate, the importance of an integrated Electronical Health Record (HER), and the need for good financial management which allows pooling of funds across services. [25] Breton *et al.* concluded that the funding model is "inadequate for centering care around the needs of patients" [26] Lindner *et al.* observed the COVID-19 pandemic from a broader, European perspective and came to the conclusion that the pandemic has acted as an accelerator for redesigning and integrating care pathways. [27] Our research adds a new aspect: a shared sense of urgency is essential if better integration is to be achieved. The driving force behind all changes in integration of acute care organisations in an urban context during the COVID-19 crisis, seemed to be a great sense of urgency to cooperate in the shared interest of providing the best patient care.

To future-proof acute care in the Netherlands, we believe that we have to look into the entire system. Population age structure has been changing since the

1960s and as the population continues to age, the burden on a shrinking working force increases, a group which plays a significant role in supporting the well-being of an aging population. [28, 29] The complexity of these challenges is further increased by the need to offer high-quality care to a demanding population while keeping healthcare systems accessible and affordable. [30, 31] To ensure people remain in good health in the decades to come, new vision is needed regarding how the current healthcare system is organised and incentivised, and how people are directed through the system. To improve outcomes across the entire healthcare system, a transformation is needed from a reactive, curative 'Disease and Cure' approach to a more proactive, preventive societal 'Health and Wellbeing' perspective. [9, 30-32] A comprehensive international population health-value perspective has previously been summarised in the Triple Aim. To help achieve the Triple Aim, PHM is one strategy that providers-financiers of healthcare can use to guide systems change. We describe in **Chapter 6** a description of the willingness and readiness of six prospective regions in the Netherlands to implement PHM using the Plot model and guided by the Five Lenses Model. The study uncovered the potential for realisation of model aims, as assessed by an expert team, regarding shared ambition, mutual gains, relationship dynamics, organisational dynamics and process management. The exploratory questionnaire suggested that organisational dynamics is the least integrated topic in all prospective regions, followed by process management, a finding confirmed in focus groups. Many prospective regions had indeed already drawn up a regional vision. The topic of mutual gain revealed that it is still difficult to coalesce the entire group of stakeholders, as stakeholders from the various organisations did not feel a common responsibility. In terms of relational dynamics, many connections were very good, but with an ongoing need to focus on cultural change, boundary spanners and mutual trust. It was felt that competence to undertake action right away was lacking, and better organisational strength and knowledge concerning process management would be needed to really do things differently. Previous studies nevertheless show that there is a drive to roll out innovative models of healthcare globally, and the importance of being ready and willing to develop and progress new integrated models of care is reinforced by experience. [33-42]

Methodological considerations and recommendations for future research

In the following sections, methodological considerations and strengths and limitations of the study designs and assessment methods applied in this thesis are discussed, as well as opportunities for future research.

Our methodological framework as presented in **Chapter 2**, shows the necessity of a mixed-methods approach in which we combine the epidemiological rigor of a pragmatic cohort study with specific outcomes, follow up period and control

situations and a more action research-oriented approach of a learning system to assess the improvement of integration of organisations as a determinant of the Triple Aim outcomes. This method of evaluation differs from a more managerial blueprint implementation in which everything is recorded in advance. Instruments used in evaluation must provide insight into practical issues, validity is certainly important but adjustments are sometimes necessary to make it work in practice. The outcome is a more or less circular process that facilitates the continuous improvement the researchers call population health management. [15] Clearly, as there is a diversity in the acute care settings in the industrialized world, any framework should be adapted to country and region-specific factors. We recommended that the framework still needs to be applied in practice and may require modification to demonstrate validity. One challenge is maintaining a balance between the components of the Triple Aim. As these components are interdependent, changes pursued in any one goal might influence the remaining goals.[4] Another problem confronting larger projects is that the identification of a comparable group is difficult and may not be available. An additional major issue that must be considered during a project is the considerable effort required to measure the dimensions of the Triple Aim. During a project in the Netherlands presented in **Chapter 3** it emerged that data collection in acute care services was very demanding in the view of the multiple organisations that needed to cooperate within the multi-stakeholder network. As an example, a first report is received by the GPC, subsequently forwarded to the ambulance service, and all subsequent treatment by different care providers must eventually be retrieved from the GP's patient file once completed. As a result, projects of this type have often 'just' started, without scientific evaluation. To improve chances of success, the researchers suggest that a plan for data collection should be carefully thought-out before starting a project, as has been demanded by many authors before. [43, 44]

For most studies presented in this thesis, we used a mixed-methods design including questionnaire surveys, interviews, and/or focus groups (**Chapter 3, 5, 6**). There are several limitations in our questionnaire surveys that should be addressed to be able to put the results presented in this thesis into perspective. As no validated questionnaire already existed, able to measure experiences across the entire acute care network, we developed our own questionnaires based on other validated questionnaires. For example, in **Chapter 3** we developed a questionnaire based on three validated Dutch Consumer Quality Index (CQI) questionnaires (CQI ED, CQI ambulance care and CQI GPC). [45, 46] The questionnaire to measure care professionals' experiences consisted of the validated 'Leiden Quality of Work Life Questionnaire', further supplemented with project-specific questions. [47] A focus group was organised to allow in depth discussion and exploration of the cooperation topics and to give professionals

the opportunity to provide advice for further improvement. The relatively high drop-out rate in the retrieval of questionnaires among patients during the intervention, made interpretation of qualitative data difficult. However, the results offer a glimpse into experiences with acute care in the region. In **Chapter 5**, 22 stakeholders received a digital questionnaire based on topics of the validated Rainbow Model of Integrated Care (RMIC) Measurement Tool [48] to provide a baseline overview of which changes in integration took place during the COVID-19 crisis, secondary to the qualitative research. The loss of eight out of 22 requested surveys could potentially bias the results. There are threats to the validity of the questionnaire because of the low number of responses, the lack of evidence of validity and the lack of significant differences between the three time frames. As such, the questionnaire is intended to provide a baseline overview of the changes seen in integration during the crisis and is therefore secondary to the qualitative results. Strengths of this study include that we have explored integration at all levels of organisation using the RMIC as a framework for evaluating the acute care network as a whole, across more than ten different organisations. The methods and analyses are built upon strong theoretical frameworks concerning cooperation and integration. The mixed-methods approach, in which the questionnaire is used as a visual baseline, further strengthens the qualitative results together with the organized member check event on 16 September 2020 at which all participants were able to discuss preliminary results of the study. In **Chapter 6**, the key stakeholders of the six prospective regions received an online questionnaire designed to provide an exploratory baseline overview on the five building blocks of "Five lenses on cooperation model". [49] The questions were further developed with the help of the Plot model team. There was a low response rate for the questionnaire, which means the results may not be representative. However, again the questionnaire is intended to provide a baseline overview of the integration level of the prospective regions and is therefore secondary to the qualitative results. Another limitation is the fact that the researchers only interviewed a group of stakeholders who were selected by the key stakeholder depending on the burning platform (a specific population segment with a high risk of adverse outcomes) [50, 51] of that region and included only one or two stakeholders per organisation. Therefore, we advise further studies, for example a due diligence research.

Both studies presented in **Chapter 4 and 5** were conducted in an urban region of the Netherlands, and therefore some recommendations will not fully be applicable in other regions. For example, interviewees mentioned barriers deterring a visit to the own GP were mainly logistical, including not being registered with a GP, the GP was too far away, poor GP telephone accessibility or a waiting list for an appointment (**Chapter 4**). Another example is that interviews would like to see Primary Care Plus (PC+), a type of integrated care in

which GPs treating patients in primary care can consult medical specialists for advice, continued in the acute care setting beyond the COVID-19 crisis (**Chapter 5**). These issues varies regionally, and therefore we recommend further studies to propose region specific advices.

Future directions

We started the general introduction with the question: Is an ‘’acute care supermarket”, as we use as a metaphor for full integration of acute care organisations, the path to increased efficiency? This thesis shows there are opportunities at all levels of integration and that we are obliged to seize these opportunities:

Opportunities for administrators and managers
The Triple Aim for acute care can be met using relatively simple interventions, but only if hospital administrators, managers, and colleagues first investigate what employees encounter before beginning a project. A ‘’top-down” approach can be successful, but collaboration between all levels is necessary for it to succeed. Keeping the story of Sam in mind, investigation into communication and Information Technology (IT) between the different acute care organisations is very important for improvement of coordination. During our evaluation to determine the added value of merging medical data from ambulance services and GPCs for acute care users, differences in satisfaction with the collaboration between different acute care professionals were often linked to issues such as a lack of understanding of the logistical details. Apparently, the project was not tested at a micro-level. At a meso-level, managers would do well to provide joint trainers and courses to improve collaboration, as well as more frequent meetings to gain a better understanding of each other’s work. Before starting any project, merging of medical data is critical for proper monitoring of the implementation of these policies. Afterwards, a project can be sustainably implemented at the macro-level. Furthermore, a shared sense of urgency is essential for better integration. Our study during the COVID-19 pandemic identified both facilitators and barriers to the organizational dimension, such as lack of clear policies and communication between hospitals and the various nursing homes, unresolved issues leading to mistrust, and a misaligning of priorities between the different organisations. There are many opportunities for improvement of these issues. Functional aspects such as shared Electronic Health Record (EHR) and adequate funding were lacking and not successfully addressed during the pandemic, leading to the questioning whether the achieved extra integration for acute services would survive long-term in absence of a health crisis. We recommend shifting the post-crisis focus from overcoming the crisis to overcoming cooperative challenges.

Opportunities for acute care professionals

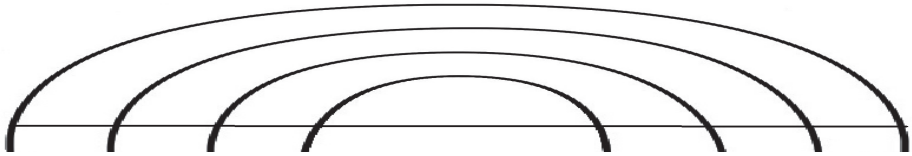
Stakeholders from all acute care organisations experience enormous pressure due to the shortage of personnel and growing influx of patients. The number of patients visiting acute care organisations inappropriately shows the need for improvement along these lines. Our study about self-referred patients to the ED shows a wide variety of motives and barriers leading to patients who are in fact in need for primary care going instead directly to an ED during daytime. This indicates that there is no straightforward solution to the high level of self-referral. Additionally, as patients reported that a variety of factors contributed to their decision, the same patients may require several different interventions. Providing clearer information about the Dutch healthcare system through a variety of channels may influence the factors contributing to patient self-referral to an ED. Interviewees had suggestions for the dissemination of information, such as a letter with information, a poster hanging in their GP's office, a television advertising campaign, or advertisements on YouTube, thereby improving patient knowledge and avoiding misconceptions regarding their personal complaints and their knowledge of GP competencies. Better information about a GP's emergency telephone accessibility and providing examples of the types of emergencies that can be handled by a GP may help improve the image of GP accessibility. Furthermore, our study during the COVID-19 pandemic shows some other opportunities for acute care professionals as well. Eventual future goals for the GPC include a partly fixed group of GPs at the GPCs, clear agreements about task allocation between GPs, Nurse Practitioners (NPs) and medical assistants to facilitate better cooperation. Furthermore, many stakeholders would like to see Primary Care Plus (PC+), continued in the acute care setting beyond the COVID-19 crisis. They added that it would be very helpful to include elderly care physicians and psychiatrists in that structure as well. Stakeholders expressed a desire for better integration of different EHRs. A desire for an investment into more digital solutions such as digital triage and consultations was also mentioned. Several participants mentioned that it would be good to invest in more interprofessional education, to discuss calamities together with all involved organizations, and to continue structural meetings between professionals after the crisis.

Opportunities for my future colleagues: GPs trainees

The healthcare landscape is changing and our work will change with it. The mismatch in care supply and demand which already exists will only increase in the years to come. One of our studies shows that pressure on acute care also arises from organisational issues in – and misapprehensions concerning daytime regular general practice. Interviewees named barriers leading to their deterring a visit to the own GP as mainly logistical, including not being registered with a GP, the GP being too far away, poor GP telephone accessibility,

or needing to join a waiting list for an appointment. There is an association between GP accessibility and the number of people who self-referred to the hospital, along with a shortage of all employees working in General Practice. In order to further improve acute care, these problems too must be solved, demanding our best creativity, flexibility and calls for further research.

Recommendations for future research: the supermarket model



	Normative integration	Functional integration
Clinical	The patient as most important common interest Clear agreements about work processes Structural moments for feedback The feeling of a common responsibility Communication managerial levels and workplace Trust in each other's work Understanding of each other's challenges Positive work environment Learning curve Shared trainings and activities	Central triage Insert in the right healthcare professional Coordination patient outflow A common registration point Digital solutions: electronic health records and consultations Availability and telephone accessibility General practice during daytime Primary Care Plus in acute care
Professional	The patient as most important common interest Interprofessional education Discuss calamities across organisations Structural meetings Trust	Shared protocols Interprofessional governance
Organizational	The patient as most important common interest Providing clear information about the Dutch healthcare system Shared vision Clear policies and communication Existing problems need to be solved A good platform for discussion (e.g. ROAZ) Frequent contact Transparency (e.g. in capacity) Trust Urgency and dependency Mutual gain	Sharing of personnel Shared service-management Structural evaluation of function of the network A good distribution of care One representative for all various organisations in a region: "Too many cooks spoil the broth"
System	The patient as most important common interest Cooperation patient association Communication managerial levels and insurers Insurers close to the acute care network	A regional market leader for all different insurance companies with a facilitator role Funding system that facilitate integration (not competition)

Figure 1. Elements of an '' acute care supermarket''

''An acute care supermarket'', as a metaphor for full integration of acute care organisations, is still years off. Our study during the COVID-19 pandemic shows that the integration level between the participating organisations was lower at the time of the study (between aligned and coordinated) along all six integration levels, than the preferred situation (between coordinated and completely integrated). Future research has to establish whether such a full integration is truly desirable and reachable. Our studies found important elements that would argue for this supermarket model at all levels of the RMIC, shown in figure 1. Some elements are already fully embedded in the collaboration in some regions, while others are already partially applied but still require further expansion, and still many other issues are stakeholders' dreams for the future, mentioned during our studies. Future research is needed to further explore these elements, to add other important elements, and to evaluate new interventions. To date, acute care initiatives applied only one or a few elements from the model at the same time, but all elements from the model have never been used simultaneously. One of our studies showed that the participating stakeholders preferred combining and coordinating acute care as much as possible to realise this integrated vision of acute care. To make this dream come true, we recommend new intervention initiatives that include all the elements simultaneously. Our methodological framework for evaluating transitions in acute care services in the Netherlands can be used as guidance to provide a clear and accessible evaluation of various new intervention initiatives. To provide insight into the integration level between acute care organisations, our practically developed applicable tool named the 'Integration monitor Care coordination' will be useful once validated.

Overall conclusion

The future directions explored in this thesis may contribute to further improvement of acute care at all integration levels to maintain accessibility in the future. Findings from this thesis can also be used to set up larger studies concerning integration of the acute care on larger-scale with more involved stakeholders and patients to confirm and further explore our results.

References

1. M. van Rijn mvMZeS. Aanbieding houtskoolschets acute zorg. Kamerstuk: Kamerbrief 03-07-2020. 2020.
2. Porter ME, Teisberg EO. How physicians can change the future of health care. Jama. 2007;297(10):1103-11.
3. Teisberg E, Wallace S, O'Hara S. Defining and Implementing Value-Based Health Care: A Strategic Framework. Acad Med. 2020;95(5):682-5.
4. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health affairs (Project Hope). 2008;27(3):759-69.
5. Obucina M, Harris N, Ja F, Chai A, Radford K, Ross A, et al. The Triple Aim framework in the context of primary healthcare: A systematic literature review. 2018.
6. Katz EB, Carrier ER, Umscheid CA, Pines JM. Comparative effectiveness of care coordination interventions in the emergency department: a systematic review. Annals of emergency medicine. 2012;60(1):12-23. e1.
7. Capp R, Misky GJ, Lindrooth RC, Honigman B, Logan H, Hardy R, et al. Coordination program reduced acute care use and increased primary care visits among frequent emergency care users. Health Affairs. 2017;36(10):1705-11.
8. Lee MH, Schuur JD, Zink BJ. Owning the cost of emergency medicine: beyond 2%. Annals of emergency medicine. 2013;62(5):498-505. e3.
9. Bachynsky N. Implications for policy: The Triple Aim, Quadruple Aim, and interprofessional collaboration. Nurs Forum. 2020;55(1):54-64.
10. Førland O ZE, Hunskår S. Samhandling mellom ambulansearbeider og legevaktlege Cooperation between ambulance personnel and regular general practitioners. Tidsskr Nor Laegeforen. 2009 May 28;129(11):1109-11. Norwegian. ;doi: 10.4045/tidsskr.08.0501. PMID: 19488093.
11. van der Linden MC, Lindeboom R, van der Linden N, van den Brand CL, Lam RC, Lucas C, et al. Self-referring patients at the emergency department: appropriateness of ED use and motives for self-referral. International journal of emergency medicine. 2014;7(1):28.
12. Smits M, Peters Y, Broers S, Keizer E, Wensing M, Giesen P. Association between general practice characteristics and use of out-of-hours GP cooperatives. BMC Fam Pract. 2015;16:52.
13. Rutten M, Vrielink F, Smits M, Giesen P. Patient and care characteristics of self-referrals treated by the general practitioner cooperative at emergency-care-access-points in the Netherlands. BMC Fam Pract. 2017;18(1):62.
14. de Haan P, Breuer J. Van EHBO naar spoedeisende hulpafdeling. WCS nieuws. 2009;25(3):30-2.
15. de Valk J, Taal EM, Nijhoff MS, Harms MH, Lieshout EM, Patka P, et al. Self-referred patients at the Emergency Department: patient characteristics, motivations, and willingness to make a copayment. Int J Emerg Med. 2014;7:30.
16. Kraaijvanger N, Rijpsma D, van Leeuwen H, Edwards M. Self-referrals in the emergency department: reasons why patients attend the emergency department without consulting a general practitioner first-a questionnaire study. Int J Emerg Med. 2015;8(1):46.
17. Rassin M, Nasie A, Bechor Y, Weiss G, Silner D. The characteristics of self-referrals to ER for non-urgent conditions and comparison of urgency evaluation between patients and nurses. Accid Emerg Nurs. 2006;14(1):20-6.

18. Baker R, Bankart MJ, Rashid A, Banerjee J, Conroy S, Habiba M, et al. Characteristics of general practices associated with emergency-department attendance rates: a cross-sectional study. BMJ Qual Saf. 2011;20(11):953-8.
19. DutchHealthcareAuthority. Market scan acute care [in Dutch: Marktscan acute zorg 2017]. https://pucoverheidnl/nza/doc/PUC_3650_22/1/. 2017.
20. Mooijaart SP. Improving the care for older emergency department patients: the Acutely Presenting Older Patient study. Z Gerontol Geriatr. 2021;54(2):97-8.
21. de Gelder J, Lucke JA, de Groot B, Fogteloo AJ, Anten S, Mesri K, et al. Predicting adverse health outcomes in older emergency department patients: the APOP study. Neth J Med. 2016;74(8):342-52.
22. Kroneman M, Boerma W, van den Berg M, Groenewegen P, de Jong J, van Ginneken E. Netherlands: Health System Review. Health Syst Transit. 2016;18(2):1-240.
23. Valentijn PP, Boesveld IC, van der Klauw DM, Ruwaard D, Struijs JN, Molema JJ, et al. Towards a taxonomy for integrated care: a mixed-methods study. International journal of integrated care. 2015;15:e003.
24. DutchHealthcareAuthority. Monitor acute care 2018 [in Dutch: Monitor acute zorg 2018]. Available at URL: https://pucoverheidnl/nza/doc/PUC_260889_22/1/ 2018. 2018.
25. Suter E, Oelke ND, Adair CE, Armitage GD. Ten key principles for successful health systems integration. Healthc Q. 2009;13 Spec No(Spec No):16-23.
26. Breton M, Wankah P, Guillette M, Couturier Y, Belzile L, Gagnon D, et al. Multiple Perspectives Analysis of the Implementation of an Integrated Care Model for Older Adults in Quebec. International journal of integrated care. 2019;19(4):6-.
27. Lindner S, Kubitschke L, Lionis C, Anastasaki M, Kirchmayer U, Giacomini S, et al. Can Integrated Care Help in Meeting the Challenges Posed on Our Health Care Systems by COVID-19? Some Preliminary Lessons Learned from the European VIGOUR Project. International journal of integrated care. 2020;20(4):4-.
28. Verwest F, Taylor P, van Wissen L, van Dijk J, Edzes A, Hamersma M, et al. Resilient labour markets and demographic change in selected regions of the Netherlands. Demographic Transition, Labour Markets and Regional Resilience: Springer; 2017. p. 73-94.
29. Nagarajan NR, Sixsmith A. Policy Initiatives to Address the Challenges of an Older Population in the Workforce. Ageing International. 2021:1-37.
30. Steenkamer BM, Drewes HW, Heijink R, Baan CA, Struijs JN. Defining Population Health Management: A Scoping Review of the Literature. Popul Health Manag. 2017;20(1):74-85.
31. Blobel B, Ruotsalainen P, editors. Healthcare Transformation Towards Personalized Medicine-Chances and Challenges. pHealth; 2019.
32. Johansen F, Loorbach D, Stoopendaal A. Exploring a transition in Dutch healthcare. J Health Organ Manag. 2018;32(7):875-90.
33. McLachlan S, Williams R. Waluwin-an integrated approach towards health and wellbeing in Western NSW, Australia. International Journal of Integrated Care (IJIC). 2016;16(6).
34. Ilmo Keskimäki TS, Juha Koivisto. Integrating health and social services in Finland: regional and local initiatives to coordinate care. Public Health Panorama. december 2018;volume 4 issue 4.
35. Pearson C, Watson N. Implementing health and social care integration in Scotland: Renegotiating new partnerships in changing cultures of care. Health Soc Care Community. 2018;26(3):e396-e403.
36. Bruce D, Parry B. Integrated care: a Scottish perspective. London J Prim Care (Abingdon). 2015;7(3):44-8.

37. Grembowski D, Marcus-Smith M. The 10 Conditions That Increased Vermont's Readiness to Implement Statewide Health System Transformation. Popul Health Manag. 2018;21(3):180-7.
38. Stokes T, Atmore C, Penno E, Richard L, Wyeth E, Richards R, et al. Protocol for a mixed methods realist evaluation of regional District Health Board groupings in New Zealand. BMJ open. 2019;9(3):e030076.
39. Wilson P, Billings J, MacInnes J, Mikelyte R, Welch E, Checkland K. Investigating the nature and quality of locally commissioned evaluations of the NHS Vanguard programme: an evidence synthesis. Health Research Policy and Systems. 2021;19(1):63.
40. Morciano M, Checkland K, Billings J, Coleman A, Stokes J, Tallack C, et al. New integrated care models in England associated with small reduction in hospital admissions in longer-term: A difference-in-differences analysis. Health Policy. 2020;124(8):826-33.
41. Maniatopoulos G, Hunter DJ, Erskine J, Hudson B. Lessons learnt from the implementation of new care models in the NHS: a qualitative study of the North East Vanguards programme. BMJ open. 2019;9(11):e032107.
42. Valentijn PP, Vrijhoef HJ, Ruwaard D, de Bont A, Arends RY, Bruijnzeels MA. Exploring the success of an integrated primary care partnership: a longitudinal study of collaboration processes. BMC Health Serv Res. 2015;15:32.
43. Nolte E, Pitchforth E. What is the evidence on the economic impacts of integrated care? 2014.
44. Kadu M, Ehrenberg N, Stein V, Tsiachristas A. Methodological quality of economic evaluations in integrated care: evidence from a systematic review. International journal of integrated care. 2019;19(3).
45. Bos N, Sturms LM, Stellato RK, Schrijvers AJ, van Stel HF. The Consumer Quality Index in an accident and emergency department: internal consistency, validity and discriminative capacity. Health Expect. 2015;18(5):1426-38.
46. Smirnova A, Lombarts K, Arah OA, van der Vleuten CPM. Closing the patient experience chasm: A two-level validation of the Consumer Quality Index Inpatient Hospital Care. Health Expect. 2017;20(5):1041-8.
47. M. van der Doef SM. The Leiden Quality of Work Questionnaire: its construction, factor structure, and psychometriq qualities. Psychological reports. 1999;85.3: 954-962.
48. Valentijn P, Angus L, Boesveld I, Nurjono M, Ruwaard D, Vrijhoef H. Validating the Rainbow Model of Integrated Care Measurement Tool: results from three pilot studies in the Netherlands, Singapore and Australia. International journal of integrated care. 2017;17(3).
49. Bell J KE, Opheij W. . Bridging disciplines in alliances and networks: in search for solutions for the managerial relevance gap. International Journal of Strategic Business Alliances. 2013;3(1):50-68.
50. Stiefel M, Nolan K. A guide to measuring the triple aim: population health, experience of care, and per capita cost. IHI Innovation Series white paper Cambridge, Massachusetts: Institute for Healthcare Improvement. 2012.
51. Whittington JW, Nolan K, Lewis N, Torres T. Pursuing the Triple Aim: The First 7 Years. The Milbank quarterly. 2015;93(2):263-300.

Chapter 8

Summary

In the Netherlands acute care organisations are overstretched and overcrowded. The acute care networks involve different organisations, including Emergency Departments (EDs), General Practice Cooperatives (GPCs), ambulance services, acute mental health services, and home care and nursing home organisations. Crowding gives rise to major problems in healthcare and is caused by a combination of factors. As the general population continues to age, so too does the burden on the shrinking working force. Another factor is the suboptimal use of acute care, as a relatively high proportion of acute care use goes to patients presenting problems that are considered to have low urgency. Furthermore, the large number of acute care organisations involved increases the fragmentation caused by healthcare providers working independently and with too little communication, which stands in the way of effective cooperation. Due to the large number of organisations involved, there are multiple entrance and exit routes for patients in acute care organisations. Effective communication and coordination between all stakeholders at different levels of an organizational structure is crucial to providing high quality acute care.

The main objective of this thesis is to gain insight into - and find clues how acute care in the Netherlands can be improved at all integration levels, to be able to maintain accessibility of acute care for all citizens in the future. We started the general introduction with the question: Is an ‘’acute care supermarket’’, that we use as a metaphor for full integration of acute care organisations, the pathway to increased efficiency?

Main findings of this thesis

As a starting point, we developed a methodological framework for the evaluation of transitions in acute care in the Netherlands to achieve Triple Aim: improving the individual experience of care, improving the health of populations, and reducing healthcare cost growth (**Chapter 2**). This framework facilitates the evaluation of various intervention initiatives in acute care organisations in the Netherlands. It include five steps and came out of merging the key elements of three concepts: 1) Triple Aim and learning System, 2) Integrated care and 3) Population Health Management (PHM). To help achieve the Triple Aim, these concepts can be helpful as a strategy to guide systems change.

In one region in the Netherlands, GPC and ambulance service have begun to integrate their care. Now, when a patient with an acute care need calls the GPC and the triage outcome indicates that an ambulance ride is required, a digital merger ensures that a report of findings and previous history is sent to the ambulance service via a secure e-mail service. With the help of our methodological framework we evaluated this digital merger project to improve functional integration (**Chapter 3**). The purpose of this evaluation was to

determine the added value of merging medical data from ambulance services and GPCs for acute care users with the highest risk for adverse outcomes. Regarding the population health aspects of the Triple Aim, we noticed that the digital merger was possibly beneficial with a reduction in admission to nursing homes and fewer ED costs per patient calculated based on reference prices in the 30 days following the acute care request compared to patients to the control period. Patients in the intervention period were responsible for generating greater costs at the GPC. A shift from intramural to extramural care may be underway and deserves further investigation. Besides population health and costs, overall satisfaction of patients with the acute care organisations was very high. The care professionals were generally fairly satisfied with cooperation to date. However, we noted major differences between the various professions, with the most satisfied group being the GPC call handlers. Focus group comments cast some light on differences in satisfaction, which seemed to be often linked to issues such as a lack of understanding of the logistical details of digital transfer. Joint trainers and courses were suggested to improve collaboration, as well as more frequent meetings to gain a better understanding of each other's work. Our results provide an early indication of the considerable promise of medical data merging.

Patients or citizens in total cannot be missed in the subject of future-proofing acute care: they form the central point for which we do it all. Therefore, we did a qualitative interview study with patients in the acute care presented in **Chapter 4** to provide insight into the motives for hospital self-referral during office hours and the barriers deterring GP consultation with a primary care request. Self-referral often results in the improper use of an ED due to a care request that in retrospect could be better treated in a primary care setting. A total of 44 people who self-referred were interviewed in two hospitals. People who self-referred generally reported several motives for going to the hospital directly. Information and awareness factors played an important role, often related to a lack of information regarding where to go with a medical complaint. In the past many patients grew accustomed to 'accident departments' and this popular concept is still noticeable in many interviews. Furthermore, many people who self-referred mentioned hospital facilities, convenience and perceived medical necessity as motivational factors. Barriers deterring a visit to the own GP were mainly logistical, including not being registered with a GP, the GP was too far away, poor GP telephone accessibility or a waiting list for an appointment. The wide variety of motives and barriers among people who self-referred attending hospital indicates that there is no straightforward solution. However, better provision of information could be a first step in increasing health literacy and reducing misconceptions.

Until now, the ED, ambulance service and GPC have come to the fore, but acute care organisations encompass more in the Netherlands. After a patient receiving assistance at an ED or GPC, a patient can be hospitalized, referred to a nursing home, referred to an acute mental health service, receive care at home if necessary, or be referred back home without home-care. Due to the large number of organisations involved, there are multiple entrance and exit routes for patients in the acute care network. The objective of this study presented in **Chapter 5** was to gain an understanding in to which extent cooperation within an urban acute care network in the Netherlands (The Hague) improved due to the COVID-19 crisis. During the crisis many facilitators were identified at clinical, professional and system level such as clear agreements about work processes, trust in each other's work, and different stakeholders growing closer together. However, at an organisational and communicative level there were many barriers such as interference in each other's work and a lack of clear policies. The driving force behind all changes in integration of acute care organisations in an urban context during the COVID-19 crisis seemed to be a great sense of urgency to cooperate in the shared interest of providing the best patient care.

To future-proof acute care in the Netherlands, we believe that we have to look into the entire system. To ensure people remain in good health in the decades to come, new vision is needed regarding how the current healthcare system is organised and incentivised, and how people are directed through the system. We describe in **Chapter 6** a description of the willingness and readiness of six prospective regions in the Netherlands to implement PHM using the Plot model and guided by the Five Lenses Model. The study uncovered the potential for realisation of model aims, as assessed by an expert team, regarding shared ambition, mutual gains, relationship dynamics, organisational dynamics and process management. Many prospective regions had indeed already drawn up a regional vision. The topic of mutual gain revealed that it is still difficult to coalesce the entire group of stakeholders, as stakeholders from the various organisations did not feel a common responsibility. In terms of relational dynamics, many connections were very good, but with an ongoing need to focus on cultural change, boundary spanners and mutual trust. It was felt that competence to undertake action right away was lacking, and better organisational strength and knowledge concerning process management would be needed to really do things differently.

Conclusion

The future directions explored in this thesis may contribute to further improvement of acute care at all integration levels to maintain accessibility in the future. Findings from this thesis can also be used to set up larger studies concerning integration of the acute care on larger-scale with more involved stakeholders and patients to confirm and further explore our results.

Appendix

Nederlandse samenvatting (Dutch summary)

In Nederland zijn acute zorgorganisaties overbelast. Er zijn verschillende organisaties betrokken die belangrijk zijn voor de acute zorg, waaronder spoedeisende hulp (SEH), huisartsenposten (HAP), ambulancediensten, acute geestelijke gezondheidszorg (GGZ) en verpleeg- en verzorgingshuizen en thuiszorgorganisaties (VVT). Overbelasting zorgt voor grote problemen in de zorg en wordt veroorzaakt door een combinatie van factoren. Zo stijgt het aandeel van ouderen in de bevolking met meer zorgvragen als gevolg van vergrijzing en blijft hierdoor de beroepsbevolking krimpen waardoor personeelskrapte ontstaat. Een andere factor die bijdraagt aan de overbelasting is dat er geregeld suboptimaal gebruik wordt gemaakt van acute zorg. Een relatief groot deel van patiënten die gebruik maken van acute zorg hebben problemen waarmee ze bijvoorbeeld ook overdag naar hun eigen huisarts hadden kunnen gaan. Verder is door de veelvoud van acute zorgorganisaties versnippering ontstaan wat effectieve samenwerking erg uitdagend maakt. Door het grote aantal betrokken organisaties zijn er meerdere in- en uitgangsroutes voor patiënten in acute zorgorganisaties. Een patiënt met een acute zorgvraag kan bijvoorbeeld de HAP bellen of 112, maar kan ook gelijk binnenlopen op de HAP of SEH als zelfverwijzer. Effectieve communicatie en coördinatie tussen alle belanghebbenden op verschillende niveaus van een organisatiestructuur is cruciaal voor het leveren van hoogwaardige acute zorg.

Het hoofddoel van dit PhD traject is het vinden van aanwijzingen hoe en waar de acute zorg in Nederland op alle integratieniveaus verbeterd kan worden zodat acute zorg voor iedereen toegankelijk blijft. We begonnen de algemene inleiding met de vraag: Is de ‘’supermarkt’’ als metafoor voor acute zorgorganisaties de weg naar meer efficiëntie?

Belangrijkste bevindingen van dit proefschrift
Om te beginnen hebben we een instrument ontwikkeld om projecten in de acute zorg in Nederland éénduidig te kunnen evalueren met als doel de ‘’Triple Aim’’ gelijktijdig na te streven: het verbeteren van de individuele beleving van zorg, het verbeteren van de gezondheid van de bevolking en het verminderen van de groei van de zorgkosten (**Hoofdstuk 2**). Het instrument bestaat uit vijf stappen en is gebaseerd op elementen van drie concepten: 1) Triple Aim en lerend systeem, 2) Integrated care en 3) Population Health Management (PHM). Om de Triple Aim te helpen bereiken kunnen deze concepten nuttig zijn als strategie om systeemverandering te begeleiden.

In een regio in Nederland zijn de HAP en ambulancedienst hun samenwerking gaan intensiveren. Wanneer een patiënt met een acute zorgvraag de HAP belt en

na triage blijkt dat ambulance inzet wenselijk is, kan de triagist van de HAP nu een digitale beveiligde mail versturen met bevindingen en voorgeschiedenis van de patiënt naar de meldkamer ambulancedienst. Eerder vond deze overdracht alleen mondeling plaats. Met behulp van ons framework hebben we dit project geëvalueerd (**Hoofdstuk 3**). We hebben gekeken naar de toegevoegde waarde van het implementeren van een digitale NTS-koppeling tussen de HAP en ambulancedienst voor acute zorggebruikers met het hoogste risico op nadelige uitkomsten. Gedurende de interventieperiode werden minder patiënten opgenomen in het verpleeghuis. Wat de zorgkosten betreft zagen we een daling van de gemiddelde SEH kosten per patiënt, maar stegen de kosten voor de HAP, berekend op basis van referentieprijzen. De kostenreductie van de gemiddelde SEH kosten waren veel sterker dan de kostentoename voor de HAP, echter lieten de totale kosten berekend in deze studie geen significant verschil zien. Een verschuiving van intramurale naar extramurale zorg is mogelijk gaande en verdient nader onderzoek. Zorgprofessionals van de betrokken organisaties bleken redelijk tevreden over de samenwerking, echter constateerden we grote verschillen tussen de verschillende beroepen. De focusgroep gaf opheldering over deze verschillen in tevredenheid, die werd veroorzaakt door een gebrek aan kennis en informatie over de andere organisaties en onwetendheid welke inhoud van de digitale NTS-koppeling ontvangen werd door de andere partij. Gezamenlijke trainingen en cursussen werden voorgesteld om de samenwerking te verbeteren, evenals frequentere ontmoetingen om elkaars werk beter te begrijpen. De toegevoegde waarde van de digitale koppeling lijkt waardevol op Triple Aim uitkomsten, echter gezien de kleine aantallen in deze studie raden we een herhaling in een grotere context aan.

Patiënten / burgers kunnen niet ontbreken op het gebied van toekomstbestendige spoedzorg: zij vormen het centrale punt waarvoor we het allemaal doen. Daarom hebben we een kwalitatief interview onderzoek verricht met patiënten in de acute zorg, beschreven in **Hoofdstuk 4**. Zelfverwijzing leidt vaak tot oneigenlijk gebruik van een SEH vanwege een zorgvraag die achterafgezien meer passend was in de eerste lijn. In twee ziekenhuizen zijn in totaal 44 zelfverwijzers geïnterviewd. Wij hebben de motieven van zelfverwijzers met eerstelijnszorgvragen om tijdens kantooruren naar het ziekenhuis te gaan en de barrières om naar de eigen huisarts te gaan onderzocht. Zelfverwijzers gaven over het algemeen meerdere motieven aan om direct naar het ziekenhuis te gaan. Informatie- en bewustwordingsfactoren speelden een belangrijke rol, vaak gerelateerd aan een gebrek aan informatie over waar je met een medische klacht terecht kunt. In het verleden zijn veel patiënten gewend geraakt aan de term ‘Eerste Hulp Bij Ongelukken (EHBO)’ en deze term in plaats van de SEH is nog steeds voelbaar in veel interviews. Bovendien noemden veel deelnemers ziekenhuisfaciliteiten, gemak en waargenomen medische noodzaak als

motiverende factoren. Barrières voor een bezoek aan de eigen huisarts waren vooral logistiek, zoals het niet aangemeld zijn bij een huisarts, de huisarts te ver weg, een slechte telefonische bereikbaarheid van de huisarts of een wachtlijst voor een afspraak. De grote verscheidenheid aan motieven en barrières bij zelfverwijzers geeft aan dat er geen eenduidige oplossing is. Een betere informatievoorziening zou echter een eerste stap kunnen zijn in het vergroten van gezondheidsvaardigheden en het verminderen van misvattingen.

Tot nu toe kwamen de SEH, ambulancedienst en HAP aan bod maar acute zorgorganisaties omvatten meer in Nederland. Nadat een patiënt hulp heeft gekregen op een SEH of HAP, kan een patiënt worden opgenomen in het ziekenhuis, doorverwezen naar een verpleeghuis, doorverwezen naar acute GGZ, zo nodig thuiszorg krijgen of zonder thuiszorg terug naar huis worden verwezen. Deze veelvoud aan organisaties kan alleen functioneren als er goed wordt samengewerkt. Het doel van de studie gepresenteerd in **Hoofdstuk 5** was om inzicht te krijgen in de faciliterende- en belemmerende factoren van samenwerking binnen al deze acute zorgorganisaties in Den Haag tijdens de eerste golf van de COVID-19 pandemie. Ook geeft het inzicht in de veranderingen in samenwerking die hebben plaats gevonden. Tijdens de crisis zijn veel faciliterende factoren geïdentificeerd op klinisch, professioneel en systeemniveau, zoals duidelijke afspraken over werkprocessen, vertrouwen in elkaars werk en verschillende belanghebbenden die naar elkaar toe groeien. In de organisatorische dimensie werden echter veel barrières geïdentificeerd zoals een gebrek aan duidelijk beleid, onopgeloste problemen die leiden tot wantrouwen en een verkeerde afstemming van prioriteiten tussen de verschillende organisaties. Er zijn veel mogelijkheden om deze barrières te verbeteren. De functionele aspecten zoals een gedeeld of open communicerend elektronisch patiënten dossier (EPD) en adequate financiering ontbraken. De drijvende kracht achter alle veranderingen in de samenwerking van acute zorgorganisaties tijdens de coronacrisis leek een groot gevoel van urgentie te zijn om samen te werken in het bieden van de beste patiëntenzorg.

Om de acute zorg in Nederland toekomstbestendig te maken, vinden wij dat we naar het hele systeem moeten kijken. Om ervoor te zorgen dat mensen de komende decennia in goede gezondheid blijven, is een nieuwe visie nodig over hoe het huidige zorgstelsel is georganiseerd en hoe mensen door het systeem worden geleid. We geven in **Hoofdstuk 6** een beschrijving van de bereidheid en gereedheid van zes potentiële regio's in Nederland om PHM te implementeren met behulp van het Kavel model en geleid door het Samenwerkingsmodel. Het Samenwerkingsmodel omvat de thema's gedeelde ambitie, recht doen aan alle belangen, oog voor persoonlijke relaties en groepsdynamiek, professioneel organiseren van de samenwerking en een betekenisvol proces. Veel potentiële

regio's hadden al een regiovisie opgesteld. Vanuit de focus groepen kwam naar voren dat het nog steeds moeilijk is om de hele groep stakeholders te verenigen, omdat stakeholders uit de verschillende organisaties geen gezamenlijke verantwoordelijkheid voelden. In termen van persoonlijke relaties en groepsdynamiek waren veel verbindingen al goed maar was er behoefte om te focussen op cultuurverandering en wederzijds vertrouwen. Men was van mening dat de competentie om direct in actie te komen ontbreekt en dat er meer organisatiekracht en kennis nodig is om het echt anders te doen.

Conclusie

De bevindingen uit dit proefschrift kunnen bijdragen aan een verdere verbetering van de acute zorg op alle integratieniveaus om de toegankelijkheid in de toekomst te behouden. Ook kunnen ze worden gebruikt om op grote schaal studies op te zetten met betrekking tot de integratie van de acute zorg met meer betrokken stakeholders en patiënten om onze resultaten te bevestigen en verder te onderzoeken.

List of publications

International publications

2019 ***Understanding people who self-referred in an emergency department with primary care problems during office hours: a qualitative interview study at a Daytime General Practice Cooperative in two hospitals in The Hague, The Netherlands***
Minderhout RN, Venema P, Vos HMM, Kant J, Bruijnzeels MA, Numans ME.
BMJ Open
doi: 10.1136/bmjopen-2019-029853.

2021 ***Effect of COVID-19 on health system integration in the Netherlands: a mixed-methods study***
Minderhout RN, Baksteen MC, Numans ME, Bruijnzeels MA, Vos HMM.
Journal of the American College of Emergency Physicians Open
doi: 10.1002/emp2.12433.

2021 ***The Value of Merging Medical Data from Ambulance Services and General Practice Cooperatives Using Triple Aim Outcomes***
Minderhout RN, Vos HMM, van Grunsven PM, de la Torre y Rivas I, Alkir-Yurt S, Numans ME, Bruijnzeels MA.
International Journal of Integrated Care
doi: http://doi.org/10.5334/ijic.5711

National publications

2022 ***De meerwaarde van koppeling gegevens ambulancedienst en huisartsenpost***
Minderhout RN, Venema P, Vos HMM, Kant J, Bruijnzeels MA, Numans ME.
Dubbelpublicatie Huisarts & Wetenschap
doi: 10.1007/s12445-022-1521-z

2022 ***COVID-19 versnelt samenwerking in de spoedzorg***
Minderhout RN, Baksteen MC, Numans ME, Bruijnzeels MA, Vos HMM.
Dubbelpublicatie Huisarts & Wetenschap

Manuscripts

A methodological framework for evaluating transitions in acute care services in the Netherlands
Provisionally accepted, BMC Health Service Research
Minderhout RN, Vos HMM, Numans ME, Bruijnzeels MA.

Reforming healthcare in the Netherlands: practical population health management and the Plot model
Minderhout RN, van Ede AFTM, Voragen L, Verheijen C, Vos HMM, Numans ME, Stein KV, Bruijnzeels MA.

How to successfully implement Population Health Management: a scoping review.
van Ede AFTM, Minderhout RN, Numans ME, Stein KV, Bruijnzeels MA

PhD Portfolio

Summary PhD training and teaching activities

Name PhD student:	Rosa Naomi Minderhout
LUMC Department:	Department of Public Health and Primary Care/Health Campus The Hague, Leiden University Medical Centre
PhD period:	March 2018 – November 2022
Promotor:	Prof. dr. M. E. Numans
Co-promotors:	Dr. M. A. Bruijnzeels, Dr. H. M. M. Vos

Courses and training

2018 Population Health Management Advanced Course Risk Stratification

2018 Population Health Management Course Advanced Panel Management in Healthcare

2018 Population Health Management Summer course Fundamentals

2018 Population Health Management Course Governance

2018 PhD Introductory Meeting

2018 Basic Methods and Reasoning in Biostatistics

2021 BROK Course

(Inter)national congresses and presentations

Invited speaker

2018 19e Nationale Spoedzorgcongres, Utrecht, The Netherlands. Oral presentation

2019 NHG-wetenschapsdag, Nijmegen, The Netherlands. Oral presentation

2020 Refereeravond deelnemers COVID-19 studie, samenwerking acute zorg. The Hague, The Netherlands. Oral presentation

2022 International Conference on Integrated Care, Odense, Denmark. Poster presentation

Other

2019 IOH-platformdag, Leusden, The Netherlands

2020 LOVAH congres 2020, Rotterdam, The Netherlands

2022 LOVAH weteschapsdag, Utrecht, The Neterlands

Grants

2020 ZonMw programma COVID-19 Wetenschap voor de Praktijk

Teaching activities

2019 Teacher/coach of first year medical students, LUMC

Student supervision

2019 P. Venema, Medical student, LUMC. Project title: Understanding people who self-referred in an emergency department with primary care problems during office hours.

2020 M. Baksteen, Medical student, LUMC. Project title: COVID-19: an accelerator of cooperation within the acute care network

2021 S. Hundersmarck, Medical student, LUMC. CAT-student guidance: vitamin D and fatigue

2022 S. van den Doel, Medical student, LUMC. CAT-student guidance: physical therapy and knee osteoarthritis

2022 Five Population Health Management master students, Health Campus. Project case 2: development of health care use and supply in Dutch GP care in The Hague

About the author

Naomi Minderhout was born in September 17th 1993 in The Hague, The Netherlands. She obtained her VWO diploma at Segbroek college Den Haag. Thereafter, in 2011, she started her medical education at the Leiden University and obtained a medical degree in 2017. She started her career as a doctor at the emergency department of the Haaglanden Medisch Centrum because everything related to acute care was already of a great interest to her.

In 2018, she became a PhD candidate at the LUMC Campus The Hague combined with the General Practitioner (GP) training. Naomi's research focused on the reorganisation of acute care organisations to make it sustainable for the future. Her PhD project was under supervision of Prof. dr. Mattijs Numans, dr. Marc Bruijnzeels and dr. Hedwig Vos. During her employment she was involved in teaching in various courses for medical education and the Population Health Management master. She was also involved in one grant application.

Because of her passion for acute care, she wants to continue working on everything that has to do with improving acute care, also in the field of education. Therefore, as a side job she works as an out-of-hours acute doctor for many different nursing homes in The Hague and has started a company 'Festina Lente Zorg' which offers training to nurses. Perhaps she will follow the Dutch training: 'NHG-Kaderopleiding Huisarts & Spoedzorg' in the future to become a GP specialist in acute care.

Dankwoord (Acknowledgements)

En dan is het opeens zo ver, een moment waarvan ik niet altijd zeker ben geweest dat die zal komen. Dat de eindstreep in zicht komt en het erop lijkt dat ik binnenkort de titel ''doctor'' mag gaan voeren was mij nooit zonder alle mensen om mij heen gelukt.

Allereerst bedank ik graag mijn onderzoeksteam. Hedwig, je hebt me in de val gelokt en daarvoor wil ik je heel erg bedanken. Wat kwam ik zonder vermoedens naar de Campus eind 2017 om samen te sparren of SEH arts of huisarts meer bij mij zou passen. Er lag al een plan voor me klaar ook mede dankzij Mattijs en Marc: de huisartsenopleiding combineren met een PhD traject over spoedzorg, twee vliegen in één klap. Mattijs bedankt voor het vertrouwen, je hielp me koers houden om het einddoel te behalen. Marc, je bent echt als een soort leermeester voor mij gaan voelen. ''Soms moet je het diepe in zonder zwembandjes'' is zeker jouw stijl maar wat heb ik daar veel van geleerd en wat nam je me steeds mee naar gave projecten, enorm bedankt voor alle kansen.

Dan de patiënten en professionals die hebben deelgenomen aan mijn studies, zonder jullie was het niet mogelijk en jullie zijn de reden waarvoor we het doen!

Zonder goede hulp ben je nergens, lieve studenten die zo veel werk hebben verricht voor de studies: bedankt!

Een fijne werkplek is het halve werk. Om 8.10u stond Thom bij het bruggetje, een tijd fietste Laura nog met ons mee maar al snel vond ze het veel te vroeg. Om vervolgens de hele dag te lachen, kletsen en hard werken dat ook. Lieve Campus tijgers zonder jullie was dit traject zo veel minder leuk geweest, super dat jullie mijn paranimfen willen zijn! Aisha deed altijd graag met ons mee, af en toe een dansje was nooit te gek en in het begin nog elk uur een minuut planken. Dan nog onze Campus moeder Rimke en onze AIOTHO moeder Petra, wat mogen we ons allemaal rijk rekenen met jullie. Annefrans, Saskia, Michelle, Rianne, Jeroen, AIOTHO's, Nic, Joyce, Shelly-Ann en zo kan ik eigenlijk alle collega's wel opschrijven, wat zijn we een leuk team met zijn allen! Bedankt!

Lieve familie en vrienden, eerst mijn lieve tante Ellen, zonder jou was ik nooit op dit punt gekomen. Je hebt me gesteund, ik kon altijd bij jou studeren en kreeg dan de allerlekkerste lunch. Mijn lieve ouders, zus en broertje wat hebben we een fijn gezin, we kunnen altijd op elkaar rekenen en zijn afgelopen jaren behoorlijk uitgebreid met schoonfamilie en de allerliefste (klein)kids. Hard werken zit dankzij jullie in mijn genen. Jullie zijn de liefste! En dan ben ik een gezegend mens met veel familie (zelfs nog de liefste opa&oma) en vrienden

die ik daardoor niet allemaal op kan schrijven maar jullie voelen jullie zeker aangesproken. Doelen die samen worden behaald, mogen samen worden gevierd dus jullie hebben een goed feestje van mij tegoed. Dank voor alle gezelligheid, er altijd voor elkaar zijn door dik en dun.

Lieve Lara, van jou heb ik veel te vroeg afscheid moeten nemen en jij bent een veel te groot gemis voor velen. Wat had jij altijd enorme interesse in de projecten waar ik voor onderzoek mee bezig was. Jij hebt voor altijd een speciaal plekje in mijn hart.

Lieve Jim en Nolan, wat vormen wij een fijn gezin met zijn drietjes en wat hou ik super veel van jullie. Jim ik kan altijd op je hulp en enthousiasme rekenen met alle verschillende dingen die ik doe, we zijn een topteam! Nolan misschien heb je onbewust zelfs je naam te danken aan dit proefschrift, het artikel ‘’The triple aim van Berwick, Nolan and Whittington” heb ik eindeloos gebruikt als referentie. Bedankt voor al jullie liefde en op naar een fantastische toekomst!