

Structuring emergency care: Who cares?

INTEGRATING EMERGENCY CARE TO ENHANCE PERFORMANCE



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Abstract

Many organizations are propagating towards the integration of emergency care, by structuring GP cooperatives and accident and emergency departments under one window. Non-integrated accident and emergency departments are experiencing low performance and overcrowding, caused by inefficient patient flows. The goal of this research is to determine if the integration of emergency care leads to a higher performance and the specific research question on which this study focuses is "To which extent does co-location of the GP cooperative and the Accident and Emergency Department enhance the performance?". For the main question a model is created in this research, which is then reviewed by studying cases from the literature, where there has been a change from a structure without any form of integration towards a co-located integrated structure. The findings in this research are that having a co-located integrated structure has a positive effect on the performance of emergency care. To get a more complete view of the effects of integrating emergency care on performance, further research is required.

Keywords: Structuring emergency care, Integration of emergency care, Emergency care performance

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1 Introduction

1.1 Background

For some time, Dutch health policy makers, insurance companies and other actors in the field are propagating towards integration of General Practitioner (GP) cooperatives and Accident & Emergency Departments (AEDs) into one facility. They claim that such a close collaboration has become necessary as patients with an urgent out-of-hours problem feel indecisive whom they should contact: the GP cooperative, the AED or the ambulance service (Moll van Charante, ter Riet, & Bindels, 2008). As a result of the uncertainty caused by this indecisiveness Accident & Emergency Departments are having performance issues and problems with overcrowding, because of inefficient patient flows. An important factor contributing to this overcrowding is self-referral: increasingly more patients go directly to AEDs for out-of-hours services without first contacting their GP (Kool, Homberg, & Kamphuis, 2008).

Today, there are four distinguished models for structuring emergency care. A model without any form of real integration or cooperation, a model where triage is done at the GP cooperative and the AED, and self-referrals are send to the GP cooperative, a model where the GP cooperative acts in such a way that it is a portal in front of the AED, so that all patients will first have to go by the GP cooperative before they can contact the AED, and finally a fully integrated model where both the GP cooperative and the AED operate under one and the same window (Vermue, Giesen, & Huiberts, 2007).

1.2 Research goal

The goal of this research is to find out if the integration of GP cooperatives and AED leads to a higher performance. This study especially focuses on the most integrated form of the mentioned structuring models, namely a co-located model where the GP cooperative and the AED operate under a single window. Before this research goal can be achieved, first must be defined which actors are involved in emergency care, the different structuring models must be described, and it must be defined how to measure performance of emergency care.

1.3 Research question

The research question of this thesis focuses on the impact of organizational structure on performance, more concrete:

- ❖ To which extend does co-location of the GP cooperative and the Accident and Emergency Department enhance the performance?

The conceptual model in figure 1 displays a graphical representation of the research question.

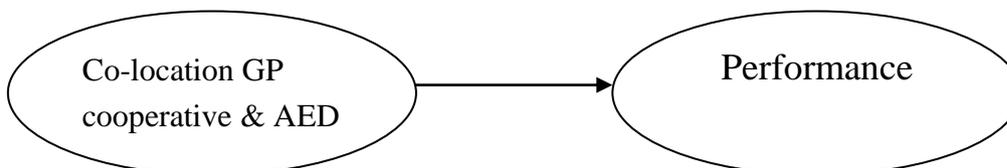


figure 1: conceptual model

2 Theory on structure and performance of emergency care

To give more insight into the subject this chapter consists of a theoretical background for the different aspects of the research. First, the research based view will be introduced to explain the importance of the allocation of resources. Then, the Dutch urgent care system will be described together with its actors and structures, and the methods for measuring performance will be described. Finally, the information from this chapter will lead to the research model which will be defined in the last paragraph of this chapter.

2.1 Resource-Based view

Within strategic management, the Resource-Based view (RBV) is a theory in which the organization is seen as a collection of tangible and intangible assets. The RBV is a way of looking at firms in terms of their resources, rather than looking at them in terms of products (Wernerfelt, 1984). The application of these resources can lead to competitive advantage. If the assumption can be made that these strategic resources are heterogeneous in nature, and also are not perfectly mobile, this short-run competitive advantage can be transformed to a sustained competitive advantage (Barney, 1991; Peteraf, 1993).

2.1.1 Defining firm resources and sustained competitive advantage

Firm Resources

Daft (1983) describes firm resources as all assets, capabilities, organizational processes, attributes, information, knowledge, etc. controlled by an organization that enable that organization to conceive of and implement strategies which will improve its efficiency and effectiveness (Daft, 1983). According to the vision of strategic analysis, the resources of a firm can be defined as strengths for firms which they can use to conceive of and implement their strategies (Learned, Christensen, Andrews, & Guth, 1969; Porter, 1981). There are many types of firm resources, not all resources are strategically relevant resources, but the different types can be classified into three different categories: physical capital resources (Williamson, 1975), human capital resources (Becker, 1964), and organizational capital resources (Tomer, 1987). Physical capital resources include all physical technology which is used by a firm, for example a firm's plant, the equipment, the location, and its access to raw materials. Human capital resources include training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in a firm. The organizational capital resources include a firm's formal reporting structure, its formal and informal planning, controlling and coordinating systems, as well as the informal relations among the groups within the firm and between firms and those in its environment (Barney, 1991).

Competitive advantage and Sustained Competitive Advantage

Following Barney, McWilliams et al. (1989), a firm creates competitive advantage when it is implementing a value creating strategy, which is not simultaneously being implemented by any current or potential competitors (Barney, McWilliams, & Turk, 1989). For a firm, this competitive advantage is called a sustained competitive advantage when, after failed efforts to duplicate that advantage by other firms, the competitive advantage continues to exist (Rumelt, 1984).

A sustained competitive advantage does not mean it will last forever. Following the definition of sustained competitive advantage by Rumelt (1984), it only suggests that the competitive advantage will not be competed away through duplication efforts by other firms (Rumelt, 1984). An industry may experience unanticipated changes in its economic structure. Those changes can lead to the effect that, what was once a source of sustained competitive advantage, is now no longer of value for a firm, and thus leads to no form of competitive advantage at all. These structural revolutions in an industry are called "Schumpeterian Shocks" (Barney, 1986c; Rumelt & Wensley, 1981; Schumpeter, 1934, 1950). However, if a firm is in possession of a sustained competitive advantage, it cannot be nullified by duplication of the benefits of that sustained competitive advantage by a competing firm.

2.1.2 VRIN model

The VRIN model is an important part of the RBV. By making use of the VRIN model resources can be evaluated by checking if they meet four criteria, and thus have the potential to create sustained competitive advantage for the firm (Barney, 1991).

Valuable

According to Barney (1991) and Amit and Schoemaker (1993), a resource is said to be of value when it enables a firm to employ value-creating strategy. It does so by enabling a firm to exploit opportunities and thereby outperform competitors or by neutralizing threats in the firm's environment (Amit & Schoemaker, 1993; Barney, 1991).

Rare

For a resource to be of value, it needs to be rare by definition. This means a resource must be rare among the firm's current competition, as well as the firm's potential competition (Barney, 1991).

In-imitable

A valuable resource can lead to competitive advantage if the resource is controlled by only one firm. If the resource is also difficult to imitate, and if competing firms will experience significant cost disadvantages by trying to obtain, develop, or duplicate such a resource, it can lead to sustained competitive advantage (Barney, 1991).

Non-substitutable

According to Barney (1986a), for a resource to create sustained competitive advantage there cannot be strategically equivalent substitutes for this resource that are valuable but aren't rare or are imitable. If any competing firm is able to find a substitute for this resource, the prices will be driven down and this will eventually lead to zero economic profits (Barney, 1986a).

2.1.3 Practical use of the RBV

Making use of the definition of firm resources and the VRIN model the following steps have to be taken to apply the theory of the RBV. (1) The firm should define and identify its potential resources that can be used to achieve competitive advantage. (2) The firm should evaluate the resources to conclude if they fulfill the four criteria presented in the VRIN model. (3) The firm should care for and protect their resources that possess the evaluations mentioned above. By doing this they can improve their organizational performance (Crook, Ketchen, Combs, & Todd, 2008).

There are different kinds of resources in emergency care. In the next paragraph the different actors, such as GPs, nurses and the specialists at the AED will be described. These actors have access to different kinds of clinical infrastructure, such as equipment and hospital services. The VRIN model can be a helpful tool to look at the importance of these actors and the clinical infrastructure.

2.2 Defining structure of emergency care

2.2.1 The Dutch urgent care system

Urgent care in de Netherlands is organized in a way that patients in need of urgent care can't be denied by any hospital and by law should be treated immediately (Vermue, et al., 2007). Both the GP cooperative and the Accident and Emergency Department are organizations which are part of this urgent care program.

General Practitioner

The primary tasks of a GP are to be the first contact person for patients who are experiencing health issues and to keep track of an overview of the complete situation of the patient (BKV, 2011). The strength of a GP is that he possesses knowledge about a lot of different health care related things. A GP does not know as much as a specialist of a specific area, but he has enough knowledge to know if a health care issue belongs to a certain specialist. If a patient has a more complex demand for care, the GP can forward the patient to another health care provider. In this process the GP acts as a coordinator to ensure the patient gets the required care (Kruijthof, 2005). A GP also knows more about the patient, the environment of the patient and his/her family than other doctors or care systems. Of all cases a GP handles approximately 90% by him/herself and the remaining 10% is forwarded to another health care provider (BKV, 2011).

Accident and Emergency Department

The AED is a specialized department within a hospital which aims to provide medical care and nursing care to victims of accidents and patients in need of urgent care (Nationaal Kompas Volksgezondheid, 2012). According to the Dutch design an AED delivers urgent care and is in possession of a sufficient amount of valuable and rare resources such as expert staff and equipment for recognition, resuscitation and stabilization of all acute medical emergencies (Werkgroep Kwaliteitsindeling Spoedeisende Hulp, 2009). Medical specialists are connected to and serve the AED. It is not necessary for them to be present all of the time. Instead, they will be called by the AED when there is a complication that's in need of their expertise. In that case they will come to the AED from home or from another department within the hospital (Kruijthof, 2005).

Primary and secondary care

The AED is available for patients twenty-four hours a day, seven days a week. GP cooperatives, which are regional centers where GPs work together for required care outside the normal working hours, are thus only available for patients after-hours, which means they are available for fifteen hours, four evenings and nights a week, and also on weekends starting from Friday afternoon till Monday morning which is sixty-three hours. This adds up to a total of one hundred twenty-three hours of after-hours urgent care per week (Vereniging Huisartsenposten Nederland, 2010). In the Dutch health care system there is made a distinction between different levels of care, this distinction is made between primary care and secondary care (Vereniging Huisartsenposten Nederland, 2010). Primary care is directly accessible care. It is the primary contact point for people who are in need of care and everyone who feels in need of care can without any restrictions appeal to one of these primary care organizations. A GP is such a primary caregiver. The primary care organizations are there to prevent people from making unnecessary use of more complex care (secondary care), which is a more scarce and expensive form of care than primary care. (Vereniging Huisartsenposten Nederland, 2010). According to a pilot study in a Dutch hospital, secondary care is showed to be nearly three times as expensive as primary care (Giesbers, 2010).

2.2.2 Patient flow

So in an after- hours situation, normally a patient will go to a GP cooperative. The patient will be treated there and if this patient is in need of more complex care, he/she can get a referral by the GP to go to the AED. That is how a patient stream should normally look like (Vereniging Huisartsenposten Nederland, 2010). In this study, patient flow can be seen as route through which the patients stream through emergency care. There are different models of structuring

emergency care which lead to different types of patient streams. These models are discussed later on. In practice, however, it shows that the last few years more and more patients are bypassing the GP and going directly to the AED without any referral from a GP. This phenomenon is called self-referral (Moll van Charante, et al., 2008).

Self-referral

Moll van Charante, et al. (2008), tell us there are many motives for patients seeing the AED without a referral from their GP. Making use of a questionnaire he asked 339 AED self-referrals in the city of IJmuiden (municipality of Velsen) about their motives for making their decision to go directly to the AED. Overall, 224 out of 339 AED self-referrals who received the questionnaire responded (66%) and from those he could make the following conclusions. Only 18% of the respondents thought that the AED was better accessible than the GP cooperative and the average respondents expectation was that they would have to wait longer in the AED than they would have at the GP cooperative. Still these people all choose to refer themselves to the AED. The main motive was that a large group of patients was convinced that they would need further research (e.g. X-rays), so that even if they would go to the GP cooperative first, they would be send to the AED (36% of all respondents). Also 30% of the respondents believed that the doctor at the AED was best qualified for the specific problem of the patient. Moll van Charante, et al. (2008), concluded that AED self-referrals express the legitimacy of their choice with the need to use diagnostic facilities and most appropriately qualified medical care for the problem presented.

Overcrowding

The self-referring patients should not go to the AED. As said above, normally a patient will go to a GP cooperative first, and will be forwarded to an AED or other secondary caregiver if the patient is in need of more complex care (VerenigingHuisartsenpostenNederland, 2010). When self-referring patients arrive at an AED they may not be denied because by law in the Netherlands, patients in need of urgent care should be treated immediately (Vermue, et al., 2007). Self-referral by itself might not be a problem. Studies show that in many cases self-referral is of great impact resulting in overcrowding of the AED (Derlet, 2002; Moll van Charante, et al., 2008). Other studies have indicated that a large amount of the patients arriving at the AED by self-referral are minor, or non-urgent cases and those patients could also be helped by a GP. These studies report that between 15% and 80% of all self-referring patients make inappropriate use of the AED services (Giesen et al., 2006; Kool, et al., 2008; Moll van Charante, et al., 2008).

Triage

At the GP cooperative and the AED the severity and the urgency is determined on the basis of an urgency code. The determination of the urgency code is called triage. At the GP cooperative and the AED there is a distinction between four different urgency codes: Urgency code 1, U1, is the most urgent case. This urgency code is used when patients' vital functions are in danger, which means that the patient is in a life threatening situation. Urgency code 2, U2, is still very urgent. It is used when on short notice the chance of the patients' situation getting worse is high. Urgency code 3, U3 is used when the patient should be treated within a couple of hours for medical or emotional reasons. Urgency code 4, U4, is the code for cases with the lowest urgency. These are simple problems, without any real time pressure (Drijver, 2005). Patients calling a GP cooperative by phone, will undergo a triage by a GP assistant according to protocol set up by the Dutch association of General practitioners (Kool, et al., 2008). The triage is supervised by a GP, and depending on the associated urgency code, the possible outcomes of the triage are: self-care advice, advice to visit his/her own GP the next day, advice to visit the AED department at the hospital, advice to visit the GP cooperative to be seen by a GP or to be seen at home by a GP. Patients who report themselves directly at a GP cooperative are seen by the GP after they are registered and after triage by the GP assistant (Elshove-Bolk, Mencl, van Rijswijck, Simons, & van Vugt, 2007). In an AED, a resident of the AED sees the patient, who could be referred by a GP or self-referred, after triage by an AED nurse (Kool, et al., 2008; Roukema et al., 2006).

2.2.3 GP cooperative and AED structure

In the current Dutch after hours care system, there are multiple existing possibilities for structuring the emergency care. According to Vermue, Giesen & Huiberts (2007), there are four possible organizational models: (1) no integration, (2) a model where there is triage at the GP cooperative as well as at the AED, and where self-referrals are send to the GP cooperative, (3) a model where the GP cooperative acts as a portal in front of the AED, and (4) a model where the GP cooperative and the AED cooperate under a single window (Vermue, et al., 2007).

Model 1: no integration

The first model is a model where there is not really any cooperation or shared recourses between the GP cooperative and the AED. In this case the GP cooperative has no connection with the hospital and the only cooperation between the GP cooperative and the AED is about regular medical consultations and referrals. As seen in figure 2, the patient flow is as follows. Patients can walk in at the GP cooperative or refer themselves to the AED. In more complex cases of health care the GP cooperative will refer a patient to the AED.

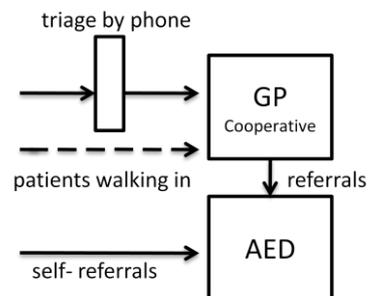


figure 2: model 1 (Vermue, et al., 2007)

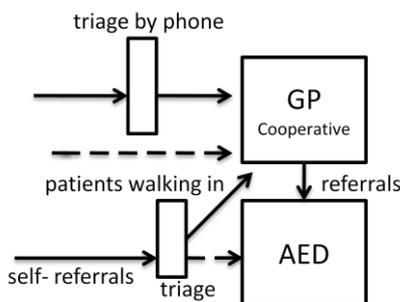


figure 3: model 2 (Vermue, et al., 2007)

Model 2: triage at GP cooperative and AED, self-referrals send to GP cooperative

The second model already has a structure where there is more integration and cooperation between the GP cooperative and the AED. Looking at the patient flow for this model: a patient refers himself/herself to the AED, there he will undergo triage, and if the case belongs to primary care he will be send to the GP cooperative. If it is the case that the patient is indeed in need of more complex care, then he will be treated by the personnel at the AED (figure 3).

Model 3: GP cooperative as a portal in front of AED

Another model where the GP cooperative and the AED show more integration and cooperation is the third model. In this model, the GP cooperative acts as a kind of portal which is structured in front of the AED. The implication on patient flow of the GP cooperative acting as a portal in front of the AED is that all self-referring patients only have one option, which is the option to go to the GP cooperative. At the GP cooperative the patient will undergo triage. If the patients' case seems to be more complex, the GP cooperative will then refer the patient to the AED for further treatment.

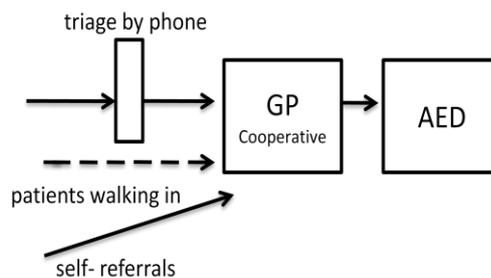


figure 4: model 3 (Vermue, et al., 2007)

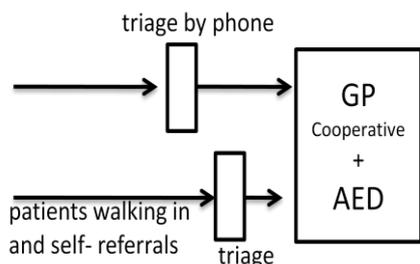


figure 5: model 4 (Vermue, et al., 2007)

Model 4: cooperation under one window

The fourth and last model described by Vermue et al. (2007), is the model with the most integration and cooperation. This model contains a co-located structure where the GP cooperative and the AED operate under a single window with shared recourses. For patient flow, this implies that a patient can only refer himself to one place, a counter shared by the GP cooperative and the AED. At this counter, the patient will undergo triage, after which he/she will be referred to the GP cooperative or in more complex cases to the AED.

2.3 Defining performance of emergency care

2.3.1 Management information

Before it can be studied how something can have an effect on performance, first it must be defined how to measure performance. To date various methods have been developed and introduced in order to measure performance. Adelaar, Janssen, Smits and Welling (2005), described how health care organizations can derive and structure management information from the organization, so that they can have better insight in the performance of the organization (Adelaar, Janssen, Smits, & Welling, 2005). Management information and the way of managing an organization can be shown in the control paradigm as seen in figure 6 (Bemelmans, 1987). In the control paradigm an organization is considered as a system, consisting of the following parts:

- Controlled system; which are the processes of the organization that need to be controlled;
- Controlling organ; which is the person or group that is steering the organization;
- Information system; which is the subsystem that captures data from the controlled system (internal data), or from the environment (external data), and presents this data to the controlling organ.

The controlled system is controlled with the use of control variables which are based on management information. These actions are called control actions. Management information may occur in structured or in non-structured form. A widely used method for structuring management information is the balanced scorecard. The balanced scorecard is particularly applicable on governmental and non-profit organizations because the model doesn't only keep the financial control variables into account, but also the non-financial control variables (Adelaar, et al., 2005).

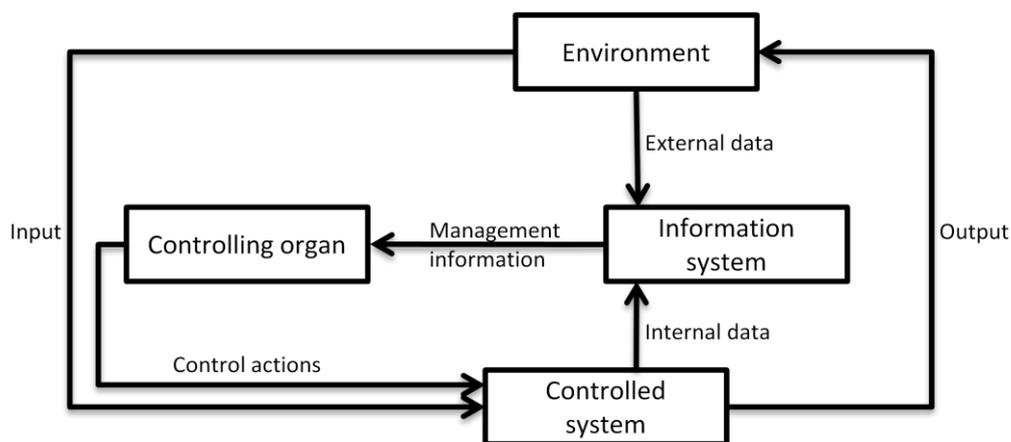


Figure 6: Control paradigm (Bemelmans, 1987)

2.3.2 The Balanced scorecard

Executives understand that in some cases traditional financial accounting measures like *return on investment* and *earnings per share* can give misleading signals for continuous improvement and innovation activities in today's competitive environment demands (Kaplan & Norton, 1996). Managers should not have to choose between financial and operational measures, that is why Kaplan and Norton came with the balanced scorecard. In short, the balanced scorecard provides top managers with a set of measures that gives a fast but comprehensive view of the business. Financial measures that tell the results of measures already taken are included in the balanced scorecard, and it also complements these financial measures with operational measures and drivers of future performance. The objectives and measures of the scorecard are derived from an organization's vision and strategy. Every company's balanced scorecard is unique, because the balanced scorecard is a collection and translation of all the strategic goals of the organization, put in concrete, measurable objectives. The

objectives and measures view the organizational performance from four perspectives which provide the framework for the balanced scorecard (figure 7):

- Financial
- Customer
- Internal business process
- Learning and growth

The balanced scorecard expands the set of business unit objectives beyond the summary of the financial measures. In organizations, now can be measured how the business units create value for current as well as future customers and how internal capabilities must be enhanced and should be invested in people, systems, and procedures to improve future performance. Kaplan, and Norton (1996) stated that “the balance scorecard captures the critical value creation activities created by skilled, motivated organizational participants. While retaining, via financial perspective, an interest in short-term performance, the balance scorecard clearly reveals the value drivers for superior long term financial and competitive performance” (Kaplan & Norton, 1996).

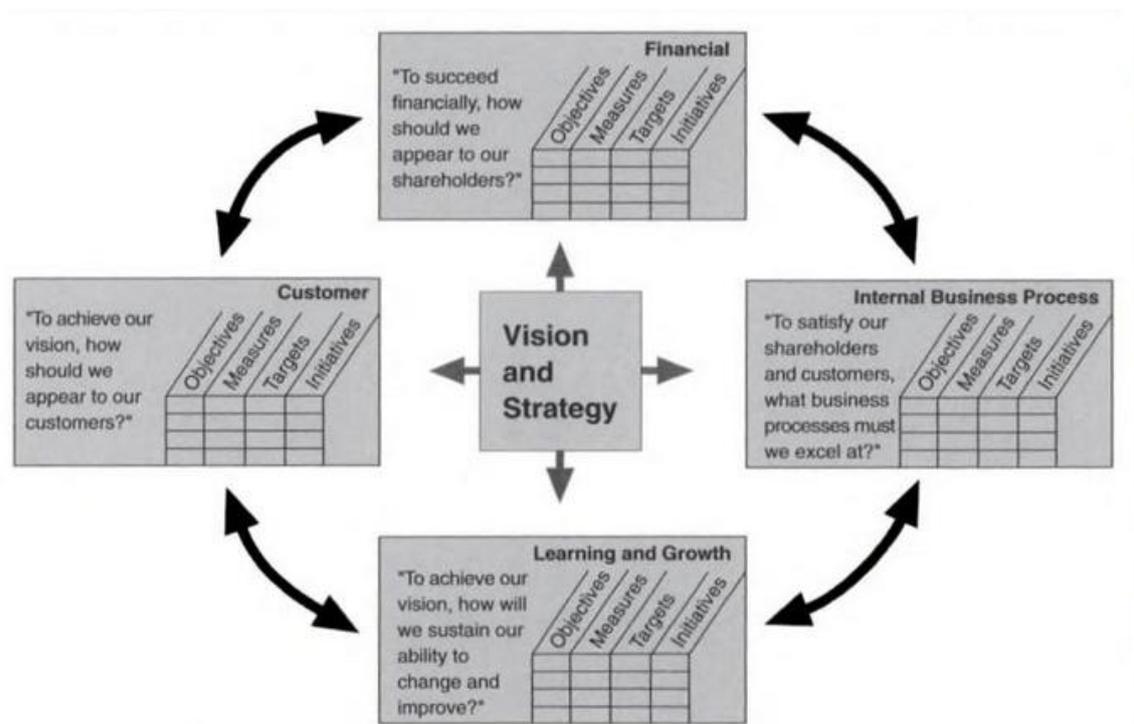


Figure 7: Balanced scorecard framework to translate a strategy into operational terms (Kaplan & Norton, 1996).

The balanced scorecard is more than just a tactical or an operational measurement system. By innovative companies, the scorecard is used as a strategic management system, so that they can manage their strategy over a long period of time. The measurement focus of the scorecard is used to accomplish the following four critical management processes (figure 8) (Kaplan & Norton, 1996):

1. Clarify and translate vision and strategy
2. Communicate and link strategic objectives and measures
3. Plan, set targets, and align strategic initiatives
4. Enhance strategic feedback and learning

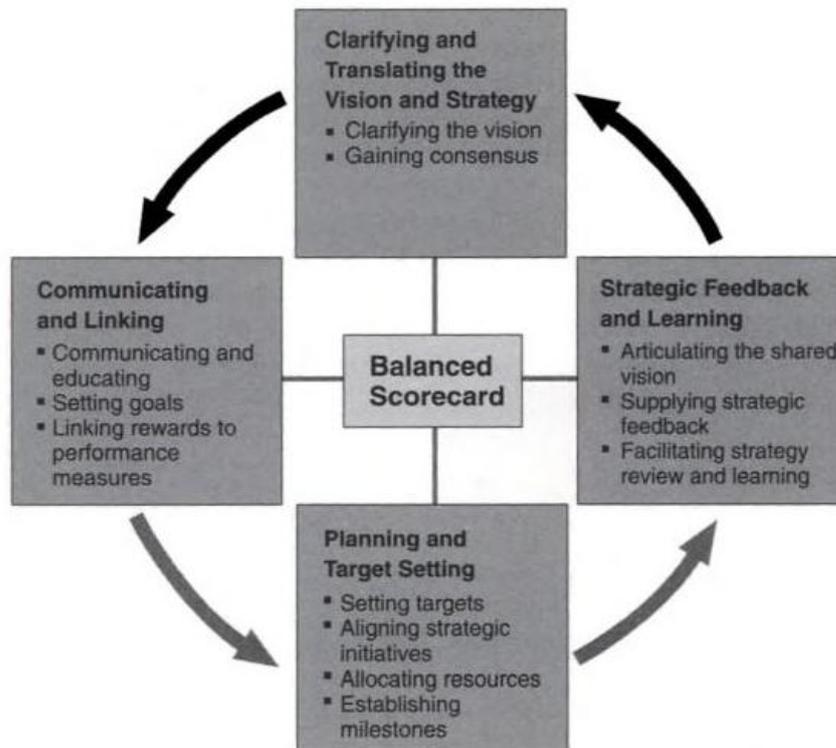


Figure 8: The balanced scorecard as a strategic framework for action (Kaplan & Norton, 1996)

2.3.3 Control variables

Control variables are performance indicators of the primary processes in an organizations (Adelaar, et al., 2005). The critical control variables offer the manager an overview of how the organization is performing and are related to control actions. Adelaar, Janssen, Smits and Welling (2005), describe three methods to derive control variables from an organization. These methods are related to the three subsystems of the previously described control paradigm by Bemelmans (1987). These methods are: (1) describing control variables from management, (2) describing control variables from processes, (3) and describing control variables from systems.

Control variables from management

Together with the management, control variables can be determined. Wondergem and Wulferink (2002) offer a questionnaire which provides a tool for identifying the need for management information (Wondergem & Wulferink, 2002). The original questionnaire can be found in appendix A. For every primary business process a manager is selected with whom questions will be answered for the categories: the connection of control variables with targets and strategy, the availability of control variables, the recognition of control variables, dysfunctional behavior in the organization, culture within the organization and the, use of control variables. Answering these questions will lead to an initial set of control variables on basis of the goals and strategy, availability, and applicability as reported by management. This does not always work, as in many cases the goals set by top down management can be too abstract. Together with professionals the goals can be formulated in more detail, so that there is a better way of measuring control variables.

Control variables from processes

Another way of defining control variables is to derive them from processes (Adelaar, et al., 2005). According to Hengeveld, Hofenk & Wijn (1996), there are three steps to do this. Step one is to go from Critical Success Factors to critical business processes. The second step is to go from critical business processes to critical control variables. The third step is to go from critical control variables to management information (Hengeveld, Hofenk, & Wijn, 1996). After obtaining the management information it is important to describe and record the performance indicators from the management information in the right way.

Control variables from systems

The third method for deriving control variables is by analyzing the existing information systems of the organization (Bemelmans, 1987). The underlying idea for this is that the collection of data in the organization must be important for the functioning of the organization and the way it is managed. Also, by making use of available data from the systems, it is prevented that unnecessary complex information systems are introduced at high costs (Adelaar, et al., 2005).

2.3.4 The performance indicators

Adelaar, Janssen, Smits & Welling (2005), applied the previously discussed methods on the GP cooperative “huisartsenpost HOV”. The situation at this GP cooperative is illustrative for what is reported nationally. In their research they applied the methods to develop and implement a management information system making use of the balance scorecard. After deriving control variables from management, processes and systems, the balance scorecard showed the following performance indicators (Adelaar, et al., 2005).

1. Customer
 - 1.1. Customer satisfaction
 - 1.2. Response time
 - 1.3. Telephone consultation in accordance to protocol

2. Internal business process
 - 2.1. Employee satisfaction
 - 2.2. Absenteeism
 - 2.3. Periodicals
 - 2.4. Evaluation interviews
 - 2.5. Travel expenses
 - 2.6. Faultless daily records

3. Learning and growth
 - 3.1. Internship
 - 3.2. Medical assistants

4. Financial
 - 4.1. Production
 - 4.2. Costs
 - 4.3. Stock use
 - 4.4. Liquidity/Solvency
 - 4.5. Uncollectible accounts receivable
 - 4.6. Days of accounts receivable
 - 4.7. Number of credit entries
 - 4.8. Cash settlement to the post

2.4 Introducing the model

Adding all up, there are big differences in structuring emergency care. In the literature review the range of models is discussed. From models which have almost no integration, to models at which the GP cooperative and the AED are fully integrated. These models will have different allocation of resources and will lead to a different kind of patient flow as described in paragraphs 2.2.1, 2.2.2, and 2.2.3. The type of patient flows can have a different effect on the previously defined aspects of performance.

The goal of this research is to determine the effect of the different models of structure, and especially the co-located highly integrated model (model 4), on performance. Therefore, the following research question is being studied.

- ❖ To which extent does co-location of the GP cooperative and the Accident and Emergency Department enhance the performance?

In the previous parts of this chapter, the resource based view is introduced as a tool to look at the importance of resources, the different models of structure in emergency care are discussed together with the different patient flows that they will lead to, and the different performance indicators for an emergency care organization are defined. From these models, patient flows, and performance indicators, a research model can be developed as seen in figure 9. In the following chapters, this research model will be studied. This will be done by testing the following hypotheses.

1. The patient flow resulting from a co-located structuring model under one window will lead to better *customer performance* than a non-integrated structuring model.
2. The patient flow resulting from a co-located structuring model under one window will lead to better *internal business process performance* than a non-integrated structuring model.
3. The patient flow resulting from a co-located structuring model under one window will lead to better *learning and growth performance* than a non-integrated structuring model.
4. The patient flow resulting from a co-located structuring model under one window will lead to better *financial performance* than a non-integrated structuring model.

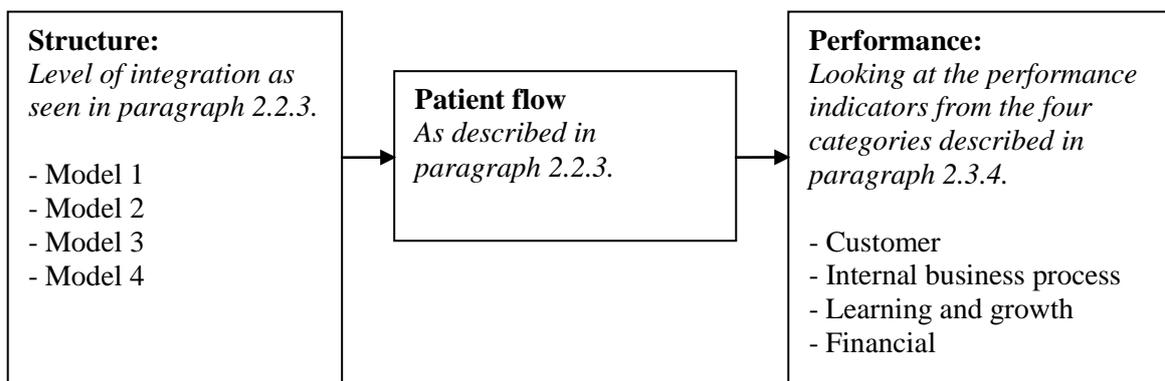


Figure 9: Research model

3 Method

In this chapter, the method for this research will be described. First, the setting of the research will be explained, second, the actors that will be part of the research will be described, and third, a procedure for achieving the goal of this research will be described together with the selection of the performance indicators from the research model.

3.1 Setting

The method which is used for the research is a method of case study. The cases used for this study contain quantitative data on structural changes and its consequences in emergency care. By looking at cases from the literature it will be studied how the structure of processes in emergency care affects the patient flow and allocation of resources in emergency care and what effect this has on the performance of emergency care, as can be seen in the research model mentioned in paragraph 2.4. These cases will be used to find an answer to the formulated hypotheses that followed from the research model in that paragraph.

3.2 Participants

The cases that will be part of this research describe a study of two integrated emergency posts in the Netherlands where there has been a change of organizational structure. At first the organizations described in the case had a structure without any real form of integration, like *model 1* from the previous chapter. From that structure model, *model 1*, they changed to a co-located integrated structure in which they operate under one window. Both the old and the new structures will be described. After the description, it will be analyzed what the effect of the change in structure was on the performance of provided emergency care by the organization. The purpose of that study is to find answers to the previously formulated hypotheses and finally to give a conclusion on the effects of structuring emergency care organizations on the performance.

3.3 Procedure

The goal of this research is to find answers for the hypotheses defined in the previous chapter. The procedure for finding these answers is to look at cases in previous studies. The quantitative data and results found in these cases can be used to formulate conclusions for this research.

In the research model in the previous chapter, performance is divided into four different categories. These categories, defined by Adelaar, Janssen, Smits & Welling (2005), contain multiple performance indicators. To find answers to the hypotheses, a performance indicator is selected from each category and will be studied in the cases. The selection of these performance indicators is based upon various other studies on performance in emergency care (Adelaar, et al., 2005; Bosmans et al., 2012; Kool, et al., 2008)

The performance indicators that are selected for the research are *patient satisfaction* for the category “customer performance”, *employee satisfaction* for the category “internal business process performance”, and *costs* for the category “financial performance”. The third hypotheses, ‘the patient flow resulting from a co-located structuring model under one window will lead to better “learning and growth performance” than a non-integrated structuring model’, will not be answered in this research, because at present, there are no data or studies available about the influence of organizational structure in emergency care on the performance indicators of the category “learning and growth performance”, *internship* and *medical assistants*.

4 Case study

In this chapter a description of literature cases will be given and the cases will be analyzed. These cases will describe a situation where there has been a change from a certain form of structure, towards another organizational structure. First the case will be introduced and a short description will be given. After the introduction it will be analyzed how the old situation was structured and how after change the new situation is structured. In the case conclusion, it will be analyzed what kind of effect these changes have on the performance indicators of the emergency care system.

4.1 Case description

The cases that will be analyzed are the cases described by Kool, et al. (2008), “Towards integration of general practitioner posts and accident and emergency departments: a case study of two integrated emergency posts in the Netherlands”. First a description of the cases studied by Kool, et al. (2008) will be given.

Introduction of the problem

Many AED and GP are experiencing problems with overcrowding. These problems with overcrowding are caused by inappropriate use of emergency care. An important factor which is causing this overcrowding is the self-referral of patients. More and more patients are going directly to AED for out of hours services without first contacting a GP. Most of these problems can be easily treated by primary care organizations and are inappropriate use of AED, because these problems could be treated by a nurse or GP at lower costs.

Integrated Emergency Posts

According to Kool, et al. (2008) increasingly more integrated emergency posts (IEPs) are created in the Netherlands, integrating the care provided by GP cooperatives and AEDs. The article studies two cases where an IEP is introduced to increase the level of integration between GP cooperatives and AEDs. One IEP has been established in Haarlem and one in Purmerend. The purpose of an IEP is to provide appropriate treatment within one co-located organization under one window where complex, specialized care is provided by the AED and less complex by GPs or specially trained nurses. IEP will shift the provision of care for certain health problems back from secondary care to primary care while still making sure they are providing patients with appropriate type of care.

An integrated emergency post works as follows:

1. Patients will check in at a joint reception or can call to a single phone number.
2. A triage will be executed. In Purmerend this is done by a trained GP assistant and in Haarlem the triage will be executed by a nurse.
3. After undergoing triage, patients will be allocated to either the AED, to a GP, to a trained nurse, or a patient will be send home in cases where self-care is sufficient.
4. A specially trained GP supervises the nurses and the GP assistants.

4.2 Case analysis

After describing the problem of the situation and the concept of integrated emergency posts, now an analysis of the studied cases in Haarlem and Purmerend will be given. At first the research will be explained and then the results of the research will be analyzed and from those results, conclusions can be drawn.

Research

The research was set up as follows. Since at the time similar innovations had not been described in the literature, Kool, et al. (2008) investigated whether IEPs meet expectations. For the research, data from the IEPs in Haarlem and Purmerend was used, together with the data from two control locations which were of similar size, had a comparable number of patients visiting the AED and GP cooperatives annually, had comparable urbanization and proportion of immigrants in catchment area and had

comparable healthcare facilities in the direct environment. A table on numbers of staff working at the IEPs and control locations, and a table of the other characteristics of the settings can be found in appendix B.

The questions that the researchers asked themselves were:

1. Whether IEP would change patient flows; by a decreasing number of patients seen by the AED and an increasing number of patients seen by the GP.
2. Whether waiting and consultation times would be shorter; by speeding up the flow of patients through the emergency services
3. Whether IEP would have an impact on patient satisfaction; by studying if patients treated at an IEP are more satisfied with their treatment than patients treated at a GP cooperative or at the AED.
4. Whether doctors, nurses, and other professionals are satisfied with the concept of an IEP.

Measures

During the research at Haarlem and Purmerend three different aspects were studied, namely, patient flow, patient satisfaction and employee satisfaction.

Patient flow can be seen as route through which the patients stream through emergency care. In this study the outcome measures for patient flow were the total number of patients seen out of hours at the AED, the GP cooperative, or the IEP, the time a patient spent at the post, and the percentage of patients that entered the AED by self-referral.

For patient satisfaction the outcome measures used in this study were the satisfaction about the accessibility of the location, waiting time, reception, interpretation of the problem, treatment and information provided, autonomy, discharge and aftercare. These factors were measured with a specially designed questionnaire.

Employee satisfaction was measured with use of a specially developed survey together with interviews conducted with 44 randomly selected GPs, nurses, AED doctors, and GP assistants working in the different settings. The outcome measures for employee satisfaction were satisfaction regarding autonomy, clarity about their tasks, staffing, patient care, use of personal capacities, social climate, information, culture, work, and organization.

Results

The research by Kool, et al. (2008), led to the following results on the measures from patient flow, patient satisfaction and employee satisfaction.

The results on patient flow, as can be seen in table 1, showed that in total 6257 patients visited the AED before the establishment of the IEPs, and only 5715 patients were referred to an AED doctor after IEPs were established. For the control setting, over the same period of time, the number of patients visiting the AED increased from 3985 to 4321. Waiting times decreased from 1 hour 56 minutes to 1 hour 42 minutes after the establishment of IEPs. In to control setting waiting times increased from 1 hour 34 minutes to 2 hours. Finally, the proportion of self-referrals decreased from 62% to 46% after the establishment of IEPs and increased from 53% to 58% in the control setting.

	IEP		Control	
	To	TI	To	TI
Number of patients A&E	6257	5315**	3985	4321*
Number of contacts GP Post	10195	12940*	14011	12719**
Time spent at post	1 hr 56 min	1 hr 42 min**	1 hr 34 min	2 hrs*
% self-referrals	62%	46%**	53%	58%*

* TI significantly higher, $p < 0.05$, Chi square ** TI significantly lower, $p < 0.05$, Chi square

Table 1: table of patient flow in the IEP and control settings

The results on patient satisfaction, as can be seen in tables 2 and 3, showed that patients who visited the IEPs were not significantly more satisfied than the control group. However, the patients who contacted the IEP by telephone were significantly more satisfied with the accessibility, interpretation of the questions, and information provided than the patients who contacted the GP cooperative in the control setting.

	IEP		Control			IEP		Control GP Posts	
	n	mean	n	mean		n	mean	n	mean
Accessibility	88	3.9	140	3.8	Accessibility	96	4.2*	53	3.9
Waiting time	146	3.4	223	3.5	Interpretation of the question	95	4.2*	52	3.9
Reception	146	3.6	220	3.6	Information and communication	91	3.7*	50	2.9
Information and communication	96	3.6	160	3.6	Discharge and aftercare	22	3.7	13	3.8
Autonomy	83	3.6	157	3.6					
Discharge and aftercare	123	3.7	188	3.7					
Interpretation of the question	135	3.7	216	3.8					
Treatment	110	3.7	201	3.8					

* significantly higher ($p < 0.05$), one-way ANOVA
(1 = not satisfied at all, 5 = very much satisfied)

(1 = not satisfied at all, 5 = very much satisfied)

Table 2: table of patient satisfaction of visitors

Table 3: table of patient satisfaction with telephone contact

The results on employee satisfaction, as can be seen in table 4, showed that employees working at IEPs were less satisfied than employees working at the control setting, regarding autonomy, social climate, the information provided by the organization, the culture of the organization, their satisfaction with their work, and the possibility to use their own capacities and skills. In the interviews almost all staff supported the idea of an IEP. However, they had problems with realizing the concept in practice.

	IEP		Control	
	n	mean	n	mean
Autonomy	120	3.7	103	3.9*
Clarity about task	120	4.0	103	4.1
Staffing	120	3.1	103	3.0
Patient care	120	3.5	103	3.6
Social climate	120	3.5	103	3.8*
Information	120	3.2	103	3.4*
Culture	120	2.6	103	4.0*
Work	120	3.2	103	3.4*
Organization	120	4.0	103	4.2
Use of personal capacities	120	3.2	103	3.4*

* significantly higher ($p < 0.05$), one-way ANOVA
(1 = not satisfied at all, 5 = very much satisfied)

Table 4: table of employee satisfaction

Case conclusion

After looking at the results of the research by Kool, et al. (2008), it can be concluded from these cases that IEPs could make emergency care more efficient. Looking at patient flows, there is an obvious shift from secondary care to primary care. Time spent at the IEP is lower than the time spent at the post before the introduction of the IEP, and the percentage of self-referring patients is lower than at AEDs without the establishment of an IEP. For patient satisfaction, it can be concluded that although there was no significant change in satisfaction for patients visiting the IEP, overall, patients are more satisfied with IEPs than they are with traditional GP cooperatives and AEDs. Looking at employee satisfaction results, together with the interviews, professionals are not yet convinced of the benefits of the IEPs, and are therefore less satisfied working at the IEP, than employees working at the control setting.

5 Discussion

5.1 Conclusion

Within this research a research model was devised to explain the influence of structuring emergency care on the performance of emergency care. This research model explained that different models of structure, defined in paragraph 2.2.3, would lead to different patient flows and allocation of resources, and would thereby have an effect on the performance indicators defined in paragraph 2.3. This research model was reviewed by studying cases in the literature.

To be able to answer the research question, “To which extend does co-location of the GP cooperative and the Accident and Emergency Department enhance the performance?”, four hypotheses have been devised and formulated in paragraph 2.4. These four hypotheses were tested by looking at the data from the cases described by Kool, et al. (2008), where in two situations, one in Haarlem and one in Purmerend, there had been a change from an organizational structure without any form of integration towards an integrated co-located structure under one window. Here are the four hypotheses with their answers:

1. The patient flow resulting from a co-located structuring model under one window will lead to better *customer performance* than a non-integrated structuring model.

In the method of this research (chapter 3) was described that the performance indicator *patient satisfaction* would be studied for the category customer performance. From the results in the case study in paragraph 4.2 can be concluded that overall, patients are more satisfied with a co-located structuring model under one window than they are with a non integrated structuring model for emergency care. Therefore, it can be concluded that the patient flow resulting from a co-located structuring model under one window has a positive effect on patient satisfaction, and thus, leads to better customer performance.

2. The patient flow resulting from a co-located structuring model under one window will lead to better *internal business process performance* than a non-integrated structuring model.

In the method was described that the performance indicator *employee satisfaction* would be studied for the category internal business process performance. In the interviews held by Kool, et al. (2008), almost all staff supported the idea of an IEP. However, from the results in the case study in paragraph 4.2, it cannot be concluded that the patient flow resulting from a co-located structuring model under one window leads to higher employee satisfaction. The employees said to have problems with realizing the concept in practice.

In the case study the employees weren't more satisfied with the highly integrated structure. However, in general, professionals and employees are known to often have difficulties coping with organizational change (Iverson, 1996). Iverson (1996) describes a causal model (appendix C) which is capable of predicting employee acceptance of organizational change. If this model is considered for changing the structure of emergency care, this could lead to a higher level of employee acceptance.

3. The patient flow resulting from a co-located structuring model under one window will lead to better *learning and growth performance* than a non-integrated structuring model.

As mentioned in the method, unfortunately, no data or other studies were found on “learning and growth performance”. It is plausible to assume that, through the allocation of resources in an integrated co-located structure of emergency care, internships and medical assistants have access to a broader range of resources within the organization and will develop a broader view of the organization and thereby develop more knowledge on the total process of emergency

care. However, there is no data to support such an assumption and therefore no conclusions are made on “learning and growth performance”.

4. The patient flow resulting from a co-located structuring model under one window will lead to better *financial performance* than a non-integrated structuring model.

In the method was described that the performance indicator *costs* would be studied for the category financial performance. From the results from the case study it showed that an integrated co-located structure of emergency care was able to shift a proportion of secondary care back to primary care. Due to this co-located structure a higher percentage of the patients was treated by a GP, and also the percentage of self-referrals was lower in comparison with a control setting without an integrated co-located structure. This shift from secondary care to primary care was achieved without decreasing, but even increasing the overall satisfaction of patients. In paragraph 2.2.2 was mentioned that the treatment of patients in secondary care is showed to be nearly three times as expensive as the treatment of patients in primary care. This means it can be concluded that, by achieving a shift from treating patients in secondary care to treating patients in primary care, costs will decrease. Adding all up, it can be concluded that the patient flow resulting from a co-located structuring model under one window will lead to better financial performance than a non-integrated structuring model.

Now, after answering these hypotheses, the research question can be considered again: “To which extend does co-location of the GP cooperative and the Accident and Emergency Department enhance the performance?”. From the answers on the hypotheses can be concluded that, indeed, co-location of the GP cooperative and the AED enhances the performance of emergency care. About the extent of this enhancement, it can be concluded that an integrated co-located structuring model will increase the *customer performance* and *financial performance*. For the performance categories *internal business process performance* and *learning and growth performance* it could not be concluded that there was a positive effect on performance. More research is needed to determine these effects on the performance of emergency care.

5.2 Research gaps

A limitation of this research is that not all hypotheses could be answered. No data was available of the effect of structuring emergency care on *learning and growth performance*. With this data a more complete answer to the research question could have been given. Another limitation of this research is that it lacks an empirical part. The research model is reviewed by study of literature cases and additional empirical research is needed to get a more complete view of the research model.

5.3 Future research

This research focuses mainly on the impact of structure on the performance of emergency care. This is not the only factor that influences performance. For example, *policy* could also have an impact on the performance of emergency care. Bosmans, et al. (2012) describes a case that shows that a certain policy has a positive effect on the performance. For future research, these factors should be combined to get a more complete view on factors that influence performance.

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Appendices

Appendix A

The original questionnaire used as a tool for identifying the need for management information, and so deriving the control variables from management by Wondergem and Wulferink (2002).

<p>Vragenlijst</p> <p>De vragen uit de onderstaande lijst kunnen gebruikt worden om bruikbare KPI's te formuleren. De vragen zijn ingedeeld naar de zes genoemde criteria.</p> <p><i>Aansluiting bij doelen en strategie</i></p> <ol style="list-style-type: none"> 1. Wat zijn de doelen van uw organisatieonderdeel? 2. Hoe (met welke strategie) wilt u deze doelen bereiken? 3. Hoe kunt u de voortgang hiervan meten? 4. Op welke manier sluit deze KPI aan bij de doelstelling? 5. Welke aspecten van de doelen worden door deze KPI gemeten, welke niet? <p><i>Beschikbaarheid</i></p> <ol style="list-style-type: none"> 1. Welke brondata zijn beschikbaar voor deze KPI? 2. Hoe kunnen die data worden ontsloten? Handmatig of automatisch? 3. Wat is de kwaliteit van de data? 4. Met welke vertraging wordt de data geleverd? 5. Wat kost het om de data te ontsluiten? <p><i>Herkenbaarheid</i></p> <ol style="list-style-type: none"> 1. Hoe bent u gewend om de voortgang te meten? 2. Hoe stuurt u met deze KPI? Welke andere informatie heeft u daarbij nodig? <p><i>Disfunctioneel gedrag</i></p> <ol style="list-style-type: none"> 1. Hoe zouden de meetwaarden gemanipuleerd kunnen worden? 2. Welke onderdelen van de definitie zijn niet eenduidig? 3. Wat kan er verwaarloosd worden door te sterke sturing op deze KPI? 4. Welke andere aspecten zijn ook van belang bij het realiseren van de doelen? 5. Als u deze KPI te eenzijdig optimaliseert, ten koste van waarvan gaat dit? <p><i>Cultuur</i></p> <ol style="list-style-type: none"> 1. Wat zijn uitgangspunten bij het gebruik van stuurinformatie? 2. Welke afspraken over prestatiemeting heeft u met uw medewerkers gemaakt? 3. Op welke manier wilt u de voortgang niet meten? <p><i>Consistentie</i></p> <ol style="list-style-type: none"> 1. Met welke andere KPI's moet deze KPI vergelijkbaar zijn? 2. Met welke andere onderdelen van de organisatie vergelijkt u prestaties? 3. Welke (externe) KPI's worden gebruikt bij benchmarking? 4. Welke gerelateerde KPI's zijn er? Wat zijn de overeenkomsten en verschillen? 5. Hoe kunnen verschillen met andere KPI's in de naamgeving tot uiting gebracht worden?

Appendix B

A table of numbers of staff working at the IEPs and control locations (Kool, et al., 2008).

	IEP 1		Control 1		IEP 2		Control 2	
	5-11 PM	11 PM-8 AM	5-11 PM	11 PM-8 AM	5-11 PM	11 PM-8 AM	5-11 PM	11 PM-8 AM
GP assistants	3	2	2-4	2	4-5	2	3	2
GPs	2	1	2-3	1	2-3	1	1-2	1
A&E doctors	1	1	1	1	1-2	1	1	1
Nurses	4-5	3	3	2	3-4	2	2-3	2

A table of the characteristics of the settings (Kool, et al., 2008).

	IEP 1	Control 1	IEP 2	Control 2
Number of visits A&ED yearly	20-30.000	20-30.000	10-20.000	10.20.000
Number of contacts GP Post yearly	20-30.000	20-30.000	10-20.000	10.20.000
Other hospital within 10 km	No	No	No	No
Immigrants	10-20%	10-20%	10-20%	10-20%
Urbanization (inhabitants per km ²)	> 2000	1000-2000	<500	<500

Appendix C

The simplified model of organizational change by Iverson (1996).

