Thesis

" Have an Eye for Yardstick competition"

**A research on the impact of Yardstick competition for
The Rotterdam Eye Hospital**

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Foreword

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Abstract

The Department of Health has planned to implement yardstick competition in the Dutch health care from January 2009. This study examined how this will influence the financial position of the Eye Hospital.

A requirement to introduce yardstick competition is that the 'firms' of the sector have to be largely similar with respect to 'technology': in this case the delivery of health. Since comparability among hospitals is hard to accomplish, this will be difficult to fulfil.

Within this study, comparison of data by a benchmark illustrated whether the delivery of eye care of eight different hospitals is similar. Since yardstick competition takes the diversity in case mix into account and gives incentives for efficiency, this may even lead to more differences between the treatments. Also, it results into positive consequences for the financial position of a hospital, when it specializes in treatments for a relatively large patient group with a high weight to the DBC in the yardstick. So, first of all, the benchmark showed the variation in treatments of patients among hospitals. Results of the benchmark recommend that, the Eye Hospital should mainly focus on medical treatments of cornea and surgical treatments of retina. Secondly, the benchmark illustrated that general hospitals did not receive any tertiary referred patients while the Eye Hospital does. As differences within a DBC are not taken into account in yardstick competition, a hospital will not receive any compensation for the more difficult cases within a patient stream, like tertiary referred patients.

Nevertheless, differences in costs are not only signalized between the regularly and tertiary referred patients. The benchmark also showed relatively big differences between the costs and the reimbursement per DBC in general for the Eye Hospital. So, a point of discussion towards the NZa and the Department of Health is that they want to implement a new reimbursement system, while in the recent DBC-system huge discrepancies exist between the costs versus the reimbursement for a patient stream.

Finally, a recommendation for further research, is to examine by which other exogenous variables a specialized hospital has more severe ill patients within a DBC, in comparison with a general hospital. Hereby, the Eye Hospital confirms that also compensation within a DBC is necessary to provide specialized and top-clinical hospitals the same perspectives as general hospitals, especially after yardstick competition has been implemented.

Dutch abstract

Het ministerie van VWS wil vanaf 1 januari 2009 maatstafconcurrentie in de Nederlandse gezondheidszorg implementeren. In deze studie is onderzocht welke invloed deze plannen zullen hebben op de financiële positie van Het Oogziekenhuis.

Voorwaarde voor de invoering van maatstafconcurrentie is dat het mogelijk is de technologie van instellingen onderling te vergelijken. In dit geval betekent dit dat het ministerie van VWS en de NZa in staat zijn de zorgverlening tussen ziekenhuizen met elkaar te vergelijken. Aangezien het vergelijken van de geleverde zorg tussen ziekenhuizen moeilijk te realiseren is, wordt hiermee het eerste knelpunt van de invoering van dit nieuwe financieringssysteem aangeduid.

Met behulp van een benchmark is in deze studie nagegaan in hoeverre de oogheelkundige behandelingen in acht ziekenhuizen verschillen. Ten eerste geeft de benchmark de variatie in behandelingen tussen ziekenhuizen weer. Doordat het ministerie van VWS voor de berekening van 'de maatstaf' verschillen tussen DBC's meeneemt, wordt rekening gehouden met de diversiteit in behandelingen van ziekenhuizen. Door aan bepaalde behandelingen een relatief hoog gewicht aan de DBC toe te kennen, heeft het een positieve uitwerking op de financiële positie van een ziekenhuis wanneer het zich specialiseert in behandelingen.

De resultaten van de benchmark laten zien dat Het Oogziekenhuis in vergelijking tot andere ziekenhuizen relatief veel patiënten poliklinisch voor cornea en operatief voor retina behandeld. Daarom is het voor Het Oogziekenhuizen met name bij deze behandelingen van belang welke DBC-gewichten hieraan wordt gekoppeld. Ten tweede komt bij de resultaten van de benchmark naar voren dat Het Oogziekenhuis het enige ziekenhuis is die tertiair doorverwezen patiënten ontvangt. Aangezien verschillen binnen een DBC niet worden meegenomen in de vergelijking tussen ziekenhuizen bij maatstafconcurrentie, krijgt een ziekenhuis geen compensatie voor een relatief complexe patiënt, zoals voor een patiënt die tertiair is verwezen naar het ziekenhuis. Daarnaast blijkt uit de resultaten van de benchmark dat niet alleen verschillen bestaan tussen de aantallen reguliere en tertiair verwezen patiënten die de ziekenhuizen binnenkomen. Ook blijken relatief grote verschillen te bestaan tussen de kosten en de vergoedingen die ziekenhuizen ontvangen voor reguliere patiënten.

Als punt van discussie wordt aangehaald dat het ministerie van VWS en de NZa overschatten in hoeverre de case mix tussen ziekenhuizen kan worden vergeleken. Eveneens wordt ter discussie gesteld dat het ministerie van VWS en de NZa een nieuw financieringssysteem beogen in te voeren, terwijl aan het huidige systeem nog gebreken blijken te zitten.

Een aanbeveling die uit dit onderzoek voortkomt is om te onderzoeken waardoor een gespecialiseerd ziekenhuizen ook in andere opzichten complexere patiënten behandelt in vergelijking tot een algemeen ziekenhuis. Hierdoor kan Het Oogziekenhuis extra benadrukken dat ook compensatie voor de zorgzwaarte van patiënten noodzakelijk is om gespecialiseerde en top klinische ziekenhuizen dezelfde mogelijkheden te bieden als algemene ziekenhuizen en niet te benadelen wanneer maatstafconcurrentie wordt ingevoerd.

1. Introduction

Health care provision is undergoing major reforms in The Netherlands. The recent reforms are based on a model of managed competition with mandatory insurance for all citizens of The Netherlands. The goal is to structure the health care and to introduce more incentives for efficiency, in order to guarantee sustainable health care expenditures for the long run (Ajodhia, 2002).

The research will be examined from the point of view of the Eye Hospital. This hospital is the only independent eye hospital in The Netherlands. For many patients, it is the 'centre of last resort´ where the patient can receive treatment. Also, the Eye Hospital is characterized as knowledge- and treatment centre. The mission of the Eye Hospital is to be a 'Centre of Excellence'. In a Centre of Excellence, strict rules are required for the treatment of patients.

As for example, quality systems are required for quality of health care indicators. The Eye Hospital achieves to distinct from other hospitals, on both national and international level, by the delivery of eye health care of high quality on a business administration method. Also, the Eye Hospital informs people with a high potential of eye complications and she invests in academic research about health care for eyes (OZR, 2007).

By this research, the hospital management attempts to foresee difficulties and possibilities for the coming reforms, and to anticipate on these developments as good as possible. Also, the Eye Hospital wants to ensure whether their exceptional position of being a top-clinical hospital will have consequences.

1.1 Background

The Minister of Health is proposing to deregulate the remainder of elective hospital care. Since the introduction of the committee 'Dekker' in 1987, the development of a market-oriented health care system started. As a result of this, the committee 'Biesheuvel' of 1994 cut back on the recent budget system for hospitals and introduced a plan for a new hospital reimbursement system. In January 2005, a new hospital financing system was implemented, which is based on Diagnosis Treatment Combinations ('Diagnose- behandelingscombinaties', DBCs). A DBC is a product definition founded on a medical description and contains the whole inpatient and outpatient activities (Zelman et al., 2003).

A DBC defines the health care process of a patient with respect to three aspects; the type of health care, the diagnosis and the treatment. The type of health care is related to the primary health state of the patient. The diagnosis gives the typification of the sub-specialty a patient is diagnosed for. Next, the type of treatment classifies the performances of the doctor, for example if the treatment is medical or surgical (De Geus, 2002; Zuurbier and Krabbe-Alkemade, 2007).

For the implementation of this new reimbursement system, The Netherlands adopted an adjusted form of the Diagnosis Related Groups system (DRGs). The US Healthcare Financing Administration originally devised this system in the 1980s. Nevertheless, there are several differences between the DRG- and the DBC- system. The three main differences are mentioned here. First, both systems differ in scope. While the DRG only encompasses inpatient care, the DBC comprises the entire care path for all hospital services of a patient. Secondly, the DRG includes all costs incurred for the diagnosis as determined on discharge; a single DRG per patient for each hospital stay. The basis of the DBC on the other hand, is the total care path of anamnesis, diagnosis and treatment of the patient due to the diagnosed illness. So, for every additional diagnosed illness that has to be treated separately, another DBC is determined. The third point of difference between DRGs and DBCs, is the way in which costs are included. For both systems costs of materials and equipment, wage-costs of hospital employees and costs for staying in the hospital are included. But in addition, DBCs also incorporate fees of specialists and capital costs (De Geus, 2002).

The Dutch government has planned to replace the current budget system by a more competitive mechanism, based on the yardstick regulation principle by Schleifer (1985). Yardstick competition is a method to overcome the information problems, faced by the regulator. Under yardstick competition, prices of individual companies are made dependent on the performance, in relation to others. This is done by setting prices equal to the 'yardstick', which is usually the average cost of all companies (Ajodhia, 2002).

The Department of Health wants to introduce yardstick competition for 50% of the budget. They have planned to implement yardstick competition only for a few years; from 2009 until 2012. This period is chosen, since the Dutch Health Care Authority ('Nederlandse Zorgauthoriteit', NZa), assumes that during this period the insurance companies take a stronger position with negotiation, and may require more quality and efficiency from

hospitals. So, after 2012 the regulatory system with a 'yardstick' is no longer necessary (VWS, 13 June 2007; NZa, 2007).

Since yardstick competition seems simple and has potential benefits, it looks interesting at first sight. However, the application of yardstick competition can be quite complicated. Besides, whether the potential benefits will be realized is hard to assess. There are different crucial parameters to achieve yardstick competition, that can lead to different concerns. First, yardstick competition uses a regulatory scheme, that rewards regulated firms on the basis of how their performance relates to the performance of similar firms in the same sector.

Secondly, the introduction of yardstick competition may provide incentives for both increasing as well as decreasing quality, which has influence on the benefits of this system (CPB, 2000; Groot and Maassen van den Brink, 2007). Both the first and second aspect are explained in chapter two.

Next to the several changes yardstick competition brings within every hospital, the Eye Hospital also expects particular issues related to the fact that they are a specialized hospital. This expectation of the Eye Hospital can be explained by the earlier introduction of DBCs. Since the cataract remains in the B-segment and hereby the production in the Eye Hospital is much higher in comparison with general hospitals, the negotiation was not regarding the standard 10%, like in most of the hospitals in The Netherlands, but was about 30% of the budget of the Eye Hospital. Also, this treatment is usually offered in private clinics, where lower prices are available. So, the introduction of the DBC-system is not equal for every hospital, but brings the Eye hospital in an exceptional position (Jaardocument, 2006). As mentioned before, yardstick competition will temporarily consist of even a larger part of hospital budgets. Since the yardstick is based on the average prices in health care, it is important for the Eye Hospital to foresee if their unique position of being a specialized hospital has consequences within this regulatory system.

In the next section the aim of the study is described. In the third section the problem statement and the research questions are mentioned. Finally, section four describes the structure of the study.

1.2 Aim of the study

Since the minister of Health has intentions to introduce yardstick competition in health care in 2009, the Eye Hospital wants to anticipate on the consequences of these intentions. The main goal of the study is to examine the impact of yardstick competition on the financial position of the Eye Hospital.

1.3 Problem statement and research questions

The problem statement for this research is designed to investigate the consequences of yardstick competition for the Eye Hospital.

The problem statement for this research is:

> *"How does yardstick competition influence the financial position of the Eye Hospital Rotterdam?"*

To answer the problem statement, seven research questions are formulated:

1. *What is yardstick competition?*
2. *What are the intentions of the Department of Health to introduce yardstick competition in the Dutch health care sector?*
3. *How is yardstick competition managed in other sectors?*
4. *Which aspect of yardstick competition do experts expect to have more consequences for the Eye Hospital in comparison with general hospitals?*
5. *How do the experts recommend keeping the Eye Hospital ahead of the competition?*
6. *In what way is variation in patient streams of the Eye Hospital versus general hospitals signalized?*
7. *Does the price regulation of yardstick competition have different consequences for the Eye Hospital compared to general hospitals?*

First, research questions one until three are answered by the literature review. Next, question four and five are examined by the first phase of the research method; interviews with experts. Furthermore, research questions six and seven are examined by a benchmark. For research question six, the benchmark analyses whether differences exist in the treated patients between the approximated hospitals. For research question seven, differences in the type of patient

streams are shown and the extra costs that complex patients in comparison with regular patients provide are calculated.

1.4 Structure

In this section the structure of the study is described. The study consists of two parts; a literature review and an empirical research. Due to the combination of both parts, the problem statement and research questions are answered.

In chapter 2 the theoretical aspects of yardstick competition are described. First, different ways of defining and versions to apply yardstick competition are given. Secondly, the applicability of yardstick competition is explained. Third, the influence on the quality of health care is described. Next, the introduction of yardstick competition in the Dutch health care system is illustrated. Finally, in the last section, examples of the application of yardstick competition in other sectors are illustrated.

Chapter 3 describes the data which are used for the research method. The research study is divided into two parts. The first part is a summary of interviews with experts. Hereby, information is gathered about their opinion of yardstick competition. This gives a more complete picture than a theoretical illustration only. Next, thanks to the interviews and the theoretical part together, assumptions are made in which yardstick competition may have consequences for the financial position of the Eye Hospital. To examine whether yardstick competition may have different consequences for the Eye Hospital in comparison with general hospitals, the second part of the research study contains a benchmark.

Also, chapter 3 illustrates the justification of the research design and the way the data are analysed. After that, the validity and reliability of the study are mentioned and a research schedule presents the way the chapters are related to each other.

Chapter 4 presents the view of the experts in interviews. Next, chapter 5 explains the starting point of the benchmark, which is based on the assumed consequences of yardstick competition. In chapter 6 the results of the benchmark are shown.

Chapter 7 gives a conclusion of the research questions and the problem statement. In chapter 8 the discussion of the study is given. Finally, several recommendations are presented.

Chapter 2 Yardstick competition

In this chapter a theoretical analysis of yardstick competition is given. The first section gives a definition. The second section describes different versions of yardstick competition. Next, in section three, the applicability of yardstick competition is illustrated. The section after that illustrates the effects yardstick competition can have on the quality of health care. In the fifth section the plans of the Minister of Health for the implementation of yardstick competition in the Dutch health care system are described. In the final section several examples are given of the way in which this regulatory instrument is managed in other sectors.

2.1 Defining yardstick competition

A description of yardstick competition, formulated by Lehman and Weisman (1996) is: '*Yardstick competition is a type of tournament in which agents engage in a contest for the lowest costs*' (Lehman and Weisman, 1996: 137).

Yardstick competition is a regulatory instrument that can be used if direct competition between agents does not exist or does not lead to desirable outcomes. The regulator rewards the agents on the basis of their relative performance and therefore generates incentives for efficiency. Agents have to compete with a 'shadow firm' whose performance is determined by average or best practices in the industry.

Thus, yardstick competition implies that the principal reimburses agents, according to their relative performance. This means that their efficiency is compared to that of other agents that offer similar services and products. Their profits and budgets are dependant of this. The implementation of this mechanism induces a process of competition between agents. In other words, yardstick competition is the way of linking financial consequences to the outcome of a benchmarking procedure (CPB, 2000).

2.2 Versions of yardstick competition

Yardstick competition can be applied to different types of agents and different kinds of situations. This regulatory scheme may be implemented within a relative performance between private firms, public organisations and firms who participate in a monopolistic or oligopolistic industry.

In the case of a privately owned firm, the consumer often pays the price. In this situation, yardstick competition can be seen as a specific form of price cap regulation, by which the cap is based on relative performance. This case is referred to as relative-performance price cap

regulation. Price cap regulation is a way to control the development of prices of a firm or of a whole sector. The regulator can look backwards at the firm's historic achievements, or can use comparative information from similar sectors (Burns and Estache, 1998).

Next, price regulation in a publicly owned firm is possible. Here a budget per product is given by the government, which is called relative-performance budgeting. Since in this case the consumers do not have to pay, the production costs will be taken less into account in their decision compared to budget regulation (CPB, 2000).

Furthermore, a version of yardstick competition is suggested by Bagnoli and Borenstein (1991), which is called carrot regulation. They imply that carrot regulation can be used in a situation of 'carrot competition'. Carrot competition aims at inducing firms to expand output, by allowing them to compete with other firms for larger shares of a reward. The idea behind this, is that a firm in a monopolistic or oligopolistic industry, produces less in total than firms in perfect competition. The regulator can entice the regulated agents to compete, because the winner will receive a price. The underlying idea is that this price will lead to efficiency increases that are larger than the size of the reward (Bagnoli and Borenstein, 1991).

Several different distinctions can be made within these types of competition. According to Auriol and Laffont (1992), the most important dimension concerns the kind of technical changes that occur within the industry, which are related to the price cap regulation. It may be possible, that a technical change takes care of productive efficiency, without changing the technology in a more fundamental way. Here, yardstick competition can be a permanent solution, because it takes care of the lack of incentives for increasing the efficiency within this industry. On the other hand, when technology is changed in a way that is more permanent, yardstick competition can be implemented for a transitory period. In this latter scenario, technology can change in such a way, that the competition can be maintained naturally instead of non-natural, through yardstick competition (Auriol and Laffont, 1992).

So, yardstick competition can be implemented in both public and private firms. It is used as a regulatory scheme that consists of the application of any simulated form of competition. It can be used when agents have low incentives to promote cost efficiency, which often occurs in a situation where no competition exists or when the competition fails.

2.3 Applicability of yardstick competition

Unless yardstick competition can be implemented in both public and private firms, this regulatory system cannot be used in every sector. Whether it can be applied, depends on the kind of market failure involved. Four requirements for the application of yardstick competition can be stated. A first requirement, is that some kind of market failure has to occur. Since efficiency of the agents plays the key role in this regulatory scheme, the underlying idea of applying yardstick competition is that in the absence of such regulation, the firms have low incentives for promoting static cost efficiency. A second requirement refers to the comparability. Hence, it is necessary to compare agents in order to apply yardstick competition. Two conditions have to be met. On the one hand the sector must consist of several agents. On the other hand, the agents have to be largely similar with respect to technology. A third requirement is related to private information. In situations where the market failure requirements hold, the agents commonly know how they might improve the efficiency, both in terms of effort and in terms of technology. This knowledge belongs to their private information. According to the fourth requirement, in order to apply yardstick competition, the regulator needs to determine the relative efficiency of the agents. Two conditions have to be met for this. First, the information that is required for the benchmarking part of yardstick competition, has to be available. Secondly, the information and the benchmarking results have to be verifiable (CPB, 2000). Nevertheless, in this sector the composition of treatment methods in hospitals and the heterogeneity in health care, play an important role. Which results in the fact that the implementation of yardstick competition in the health care sector is even more complex (VWS, 13 June 2007).

2.4 Quality

In addition to efficiency, maintaining or improving quality is commonly seen as an important objective of regulation. Also, the introduction of yardstick competition may provide incentives for quality degradation, or improvement within health care. Since the perspective of the government for introducing this regulatory system is to improve efficiency, this can lead to questions about whether the quality in health care will be sustained. On the other hand, quality improvement can result in reduction of costs, through reduction of failure costs. In a budget system without an exploitation which covers costs per treatment, there is no incentive to introduce quality improvements for those treatments which still lose money. Thus, the latter

example states that the higher the expected quality of the care in a hospital, the more efficient it is required to be (CPB, 2000).

Before analyzing the consequences yardstick competition may have on the quality of health care, it is useful to define the term quality more specifically. The definition of Donabedian is used as a keynote for defining the term 'quality in health care'. Donabedian's (1982) definition for quality is ' *Quality is the correspondence between the criteria of good health care (desirable health care) and received health care (actual health care)*' (Hollands et al., 2003).

A quality indicator for hospitals can be based on patients' assessment of their treatment, on accounts of injuries caused by medical management and on external reviews of doctors' competence (Tangeras, 2002). Also, quality problems can be defined as the result of a mismatch between prior expectations and perceived quality of the service (Ajodhia, 2002). Thanks to the upcoming competition in health care, it is possible to negotiate about the primary process of health care. So, a direct relation can be presented, between the medical effectiveness, efficiency and demand-oriented health care. These aspects illustrate the quality of health care (Van Ineveld et al., 2006).

Minister Klink notes, that the implementation of yardstick competition will not only be to improve efficiency, but also to improve the quality of health care, the position of patients and clients and the investment of innovation. The possibility of the combination of better efficiency and quality is confirmed by the Counsel for the National Healthcare ('Raad voor de Volksgezondheid'). She concludes in her policy (2007), that transparency is a very important aspect for improvement of the quality in health care. Their opinion is based on the examination of 'Zorg voor innovatie: Sneller Beter - Innovatie en ICT in de curatieve sector'. This research shows that hospitals are able to invest in efficiency for the long term, without making concessions on the quality of health care.

Also, yardstick competition may give incentives for many categories of innovation. Decisions for implementation of innovations by firms, which goal is to either improve the process and/or, to save costs and/or, to replace products, are based on the expectation whether the costs in the future will be higher than the revenues. Yardstick competition leads to incentives for innovations that are focused on improving the quality, since better quality leads to a higher turnover. Next, innovations to reduce the costs also have indirect improvement of quality as a

result. Better logistics leads to shorter waiting- and treatment times, which is better for the quality of health care (VWS, 13 June 2007).

Nevertheless, it is important to notice in which way quality and prices are bound together. The Dutch Bureau for Economic Policy Analysis ('Centraal Planbureau', CPB) asserts that a higher quality may involve higher costs, and thus higher prices. At some point, there will be an optimal trade-off between the costs and benefits of quality. This happens when the marginal benefits of quality are equal to the marginal costs of delivering it. If the regulator would be able to determine what the efficient costs were, where the optimal was located and stimulate the regulated agents, there would be no problem. But if regulated agents only look at the possibilities of maximizing profits, they may want to decrease costs, by lowering the level of quality. This is called 'quality shaving'. Because quality is often difficult to verify, this could be a danger for the success of high-powered incentive schemes in general and yardstick competition in particular. However, this latter example may be the last scenario a hospital wants to take part of (CPB, 2000; Carr-Hill and Street, 2008).

2.5 Yardstick competition in the Dutch health care system
This section illustrates the plans of the Minister of Health, with respect to the implementation of yardstick competition in the Dutch health care system.

Segmentation
The Minister of Health noted that the payment of hospitals from 2009 is structured in three segments (see table 2.1). The B-segment has free negotiation of prices, volume and quality. This segment is increased from 10% to 20% from January 2008. The second segment contains yardstick competition. This is split up in two parts; the B1- segment and the A1-segment. The B1-segment has free negotiation of prices, volume and quality within the price limit of the yardstick. The A1-segment is limited through the yardstick by fixed tariffs. This latter segment includes the medical care within the 'Law of special medical treatments' ('Wet bijzondere medische verrichtingen', WBMV), the intensive care and the expensive- and orphan-drug. The third segment is the so-called A0-segment, which has no negotiation of prices. This segment contains acute health care, education and health care with an academic component (NZa, 2007; VWS, 13 June 2007).

Table 2.1: Classification of the segments

A0	A1	B1	B
No price competition	Yardstick competition		Price competition with free prices
	Fixed tariffs within Yardstick competition	Negotiation within Yardstick competition	

(VWS, 2007)

So, in the course of the introduction of yardstick competition, three financial systems exist in 2009: the B-segment, the A1- and B1-segment within yardstick competition and the recent budget model (A0-segment). As a reaction to the plans of the new classification, the CPB criticizes that this will increase the bureaucracy of the health care market (CPB, 2007).

Volume restriction
Also, the minister has taken an other advice of the NZa into account; volume restriction will be abolished. Since the hospitals will only be kept responsible for their total charges, the price caps just serve to calculate the revenue cap function, that is maximally allowed to charge. Also, the idea is to impose an upper boundary on the overall price level, rather than to impose a fixed revenue target. When the hospital charges less than the revenue cap, nothing will happen. If a hospital produces a higher volume, it will be allowed to earn more revenue. But when the hospital charges more for its produced DBCs, than it goes above the allowed price cap and earns more than the associated revenue cap. The latter scenario means that it must repay the surcharges with extra penalty (Agrell et al., 2007).

Turnover elasticity
Also, the NZa recommends using the 'Boone-indicator' to calculate the elasticity of the turnover of hospitals. Thus, the Boone-indicator measures whether the difference in marginal costs between two companies, leads to a difference in the turnover. The higher the 'turnover-elasticity', the more intense the competition is. The advise of the NZa, declares that if the elasticity of the turnover is as high as comparable sectors, the competition in the market has succeeded.
As a reaction to this, the CPB has some critical aspects that are related to the implications of the Boone-indicator. First, it is unknown when this condition is achieved, since data of the Boone-indicator are absent. Secondly, it is unclear what is meant by the turnover of hospitals. Third, this indicator is not used in the health care sector before, so it is not clear how to use it.

The CPB states that the NZa wants to relay the judgment of the success of the yardstick scheme, on a comparison of the benchmark in other sectors. In their point of view, this is not possible (CPB, 2000).

Experience of the free prices

The NZa follows the developments of the free prices in the B-segment very carefully. Her conclusion of the past period of the competition, was slightly increase prices in 2005 and slightly decreased prices in 2006. Next, the waiting lists of the treatments within the B-segment are nearly disappeared. This can be related to a higher productivity. Although competition in the health care sector is only related to 10% of the prices and the risk aspects for health care insurance are absent, the introduction of free prices has resulted to desirable effects (NZa, 2007).

In the next sub section, a description is given of the choices the Minister of Health, made with respect to the method of price regulation. Two major decisions had to be made; the formulation of the yardstick scheme and the transition of the price regulation.

2.5.1 The yardstick

The yardstick is based on the results of two variables; on the one hand the national yardstick and on the other hand the relative weights of the DBC-production of a specific hospital (see scheme 2.1).

Scheme 2.1: Technic of the yardstick

$$\frac{\text{Turnover of institution}}{\text{DBC-volume institution}} \leq \frac{\text{total costs sector (turnover)}}{\text{DBC-volume sector}} * \text{production mix index}$$

(www.nza.nl, 10 June 2007)

To explain the formulae, two examples are presented. In the first example an explanation of the calculation of the national yardstick is given. The national yardstick is based on the 'average' DBC prices. This is related to the average integral costs per DBC in the overall sector. Hereby the absorption costs of the real, integral costs of capital and labor are divided by the total amount of DBCs of all the hospitals.

Example 1

If the absorption costs of the sector are:

- Costs employees who work for wages   : 5.2 billion
- Costs doctors who work in partnership : 1.3 billion
- Costs for equipment   : 2.5 billion
- Capital costs   : <u>1.0 billion</u>
                                           10   billion

This means, that the total integral costs that are related to the DBC production of this example, are 10 billion euro. Next, the total amount of DBCs, which are annually produced in the Dutch health care sector, are 12.5 million units. So, the average cost of one DBC is 800 euro (=10.000/ 12.5). This will be the national yardstick. When the production mix index of a hospital does not deviate from the national average production mix, the hospital can charge the maximum of 800 euro per DBC.

(www.nza.nl, 10 June 2007)

Next, in example 2, the method of NZa to calculate the yardstick for a specific hospital is presented. The NZa illustrates this calculation with the method of equivalencies. This means that the NZa determines weights for every DBC, which are related to the relative costs.

For a specific hospital the relative weight of the DBC-production is taken into account, which is called the 'production mix'. These costs are based on differences between DBCs. So, a hospital with a high fraction of patients in costly DBCs, receives a high yardstick in opposition to a hospital that provides less costly treatments to its patients. Also, the 'production mix index' measures the costliness of cases treated by a hospital, compared to the costs of the national average of all Dutch hospital cases (NZa, 2007; Tangeras, 2002).

Example 2

In the second example the 12,5 million DBCs that are produced annually, are divided over two different DBCs. For the first DBC, the revenue of NZa is 2,400 euro and for the second DBC 400 euro. Next, in this example, the first DBC has been produced 2.5 million times and the second DBC 10 million times per year. One DBC still costs 800 euro.

The production mix for the first DBC is calculated as 3 (=2400/800) and for the second DBC as 0.5 (=400/ 800).

   a. When a hospital produces 20% of the first DBC and 80% of the second DBC, her production mix is 1 (=20% * 3 + 80% * 0.5). The yardstick of this hospital stays 800 euro per DBC.
   b. Next, a hospital can be specialized in the relatively 'heavy' first DBC. For example, the hospital has a product mix of 50:50, which has a production mix index equal to 1.75 (=50% * 3 + 50% * 0.5). The yardstick of this hospital becomes 1400 euro per DBC (=800 euro * 1.75).
   c. Also, a hospital can be specialized in the relatively 'uncomplicated' second DBC. For example, the hospital has a product mix of 10:90 that gives a production mix index, equal to 0.75 (=10% * 3 + 90% * 0.5). So, the yardstick of this hospital becomes 600 euro per DBC (=800 euro * 0.75).

(www.nza.nl, 10 June 2007)

The yardstick scheme

The yardstick scheme is formulated as a price cap requirement. As described in section 2.2, there are several kinds of situations and different types of agents, in which this regulatory scheme can be implemented. For the introduction of yardstick competition in the Dutch health care system, the NZa has illustrated two variants of yardstick competition; the principal variant and the sub variant.

The principal variant is based on price caps set ex ante, which are based on past experience. Hereby the associated revenue cap function should be known ex ante, which are based on DBC weights (NZa, 2007). The Dutch authority collects annual data of the types of cases, treated by the individual hospitals, categorized by DBCs. So, the NZa calculates the production mix index after the end of every year, during the transition period. The index is based on the relative weights of the DBCs and the realized DBC volume of the specific hospital. This provides certainty about the yardstick in prospect and the maximal compensation for differences in the product mix in retrospect. Thus, hospitals have the opportunity to calculate their own yardstick during the year, thanks to recent production numbers.

In the sub variant the NZa assesses the whole transitional period for all the hospitals at once. The sub variant is based on the same data the NZa uses, for the principal variant of the first year. These data in the first year, are still the starting point for the calculation of the specific hospital, in the total transitional period of yardstick competition. An important difference in comparison with the principal variant, is that the goal to achieve higher efficiency is assessed at once. Next, this goal is taken into account, by calculating the yardstick for the whole period. It gives the hospitals certainty in advance, about the absolute magnitude of the effect of the yardstick (NZa, 2007; www.nza.nl, 13 September 2007).

The effect of the yardstick, the magnitude of the product-mix, freedom in volume in DBCs and repayment if the yardstick is exceeded, have the same consequences for hospitals in both variants. To balance the pros and cons between the principal- and sub variant, four aspects are overviewed:

1. The incentives on the efficiency of hospitals are considered. In the principal variant, the yardstick competition follows the movements in the health care sector, by the annual calculation of the national yardstick with respect to the most actual data. The sub variant calculates in advance, which efficiency goals the government wants to achieve for the whole transition period. This latter calculation is based on the data of the first year of the period (NZa, 2007; VWS, 13 June 2007). The incentives to maintain a higher efficiency rate, are assumed to be higher in the principal variant. Since the behavior of a hospital will also have consequences for other hospitals, a hospital knows that every improvement in efficiency of other hospitals results in a lower yardstick for their own hospital in the next year. In the sub variant this situation does not occur, because the yardstick is already chosen.

2. The principal variant gives incentives to hospitals to improve their quality. Since investments in quality may influence the price of the production in a positive way, this affects the yardstick. Also, this movement influences the costs for the whole sector, which means that other hospitals have to follow the trend. In the sub variant, this stimulus does not exist; the incentives to save are dominant.

3. The incentives to invest, are higher in the sub variant in comparison with the principal variant. Since in this variant the yardstick is known from the beginning, the hospitals know in which situation they occur.

4. The administrative burden is lower in the sub variant. While, in the yardstick scheme of the principal variant data have to be delivered annual, this will be very cost-consuming.

The Minister of Health has decided to choose for the sub variant as a basis of the yardstick competition scheme. This decision is based on the fact that the principal variant causes a too high administrative burden (NZa, 2007; VWS, 13 June 2007).

Transition period

As the NZa has advised, the yardstick will be introduced step by step, from 2009 until 2011. This gives hospitals time to introduce instruments to sustain more efficiency and they have the opportunity to strengthen the financial property. During the transition period, yardstick competition will be introduced by annual steps of 25%. This means, in 2009 the national yardstick is only used for 25% of the budget. In this first year of yardstick competition, the maximum of the average price that the hospital is allowed to ask for a DBC, is based on the historical budget for 75% and on the yardstick for 25%. In 2010, the average price of a hospital, is based on the ratio 50%-50%. Next, in 2011, the average price of a hospital will be based on the historical budget for 25% and on the yardstick for 75%. Finally, the assumption is to introduce free competition in 2012. This is introduced only, if the Department of Health and the NZa assume the Dutch health care sector is ready for this (VWS, 13 June 2007; www.nza.nl, 13 September 2007).

Heterogeneity in health care

The Minister of Health mentions that the heterogeneity of health care, is also of major importance when yardstick competition is introduced. For example, difference in the patient population and the prices of the district are important.

As mentioned before, in the yardstick, the production mix of a hospital is calculated. This means that the relative weights of the DBC-production are taken into account. So, yardstick competition incorporates distinctions *between* DBCs of hospitals (VWS, 13 June 2007).

According to the Minister of Health, it is not possible to take differences *within* a specific DBC into account. Since the data of the differences in costs within a DBC are absent, this distinction is not (yet) possible (NZa, 2007). Differences within a specific DBC between hospitals, can be found in for example differences of the average age, or complexity of the patient population between hospitals exist. This may be the result of the district a hospital participates in, or the specialization a hospital has (De Geus, 2002).

2.5.2 Capital costs

From 2009, prices of DBCs of the hospitals will be related to the absorption costs, that are made in the hospitals, with inclusion of the costs of capital. Absorption costing attempts to allocate all, or most, of the overheads to cost centers and then absorbs these cost centers into the product or service costs, via some appropriate absorption rate. Since the total costs should be covered by DBCs, hospitals have their own responsibility for the investments (VWS, 13 June 2007). Thus, the Minister of Health is convinced, that the inclusion of capital costs in the integral prices, lead to higher quality, with decreased costs and less administrative burden. According to an analysis done by the NZa, there is no evidence about the relation between the intensity of capital and the efficiency of hospitals. So, for the introduction of the inclusion of capital costs in integral prices, no transition period follows (VWS, 9 July 2007).

The NZa, the Corporation maintenance of DBC ('Stichting DBC- Onderhoud', SDO) and the College of Building Social Services ('College Bouw Zorgvoorzieningen', CBZ) together calculated the normative capital costs ('Normatieve kapitaals Component', NKC), which is based on the costs of capital per DBC.

Since the DBC- production of 2005 was insufficiently available at the time, the report is based on estimations and the budget of 2004. Three different components are included in the NKC:

1. Interest and depreciation of capital
2. Interest on equipment
3. Interest on working capital

The normative accommodation component ('Normatieve Huisvestings Component', NHC) includes only the first component (interest and depreciation of capital) (CBZ, 2007). This repayment of the component, will cause huge reforms in 2008. Since, the structure of the national regime for building and rebuilding will change in 2008, which means that the costs of investments of hospitals is no longer included in the budgets of the hospitals. The minister of Health will use opportunity costs of capital, which is identical for every hospital (VWS, 13 June 2007). The capital costs will be included in the DBCs. The hospitals do not longer receive the opportunity costs of capital as a guaranteed compensation, but it is their own responsibility that the costs of capital are covered. The capital costs are approximately 12% of the turnover, so the square meters of the building are important for the quality of health care, the labor efficiency and the volume of the patient that can be treated. A ratio to use is the volume of patients who are treated, related to the capital costs.

To conclude, as from 2009, the average opportunity costs of the health care market are diverted in the yardstick, to enable hospitals to earn back their investment (NZa, 2007).

2.6 Examples of yardstick competition in other sectors

The number of actual applications of yardstick competition in The Netherlands is limited. The only application of this regulatory instrument, is in the electricity distribution. Nevertheless, price cap regulation is a commonly used instrument to control private companies with market power. Price cap regulation involves setting ceilings on price increases. Especially companies in network industries, are often subject to price regulation. Other examples of areas where yardstick competition is used, are the water industry in the UK and the telecommunication in the US. These examples are chosen, to show interesting differences between countries and between different types of industries (CPB, 2000).

First, the example of yardstick competition in the water industry in the UK is described. The Office of Water Services (OFWAT), regulates the 26 private water companies in England and Wales. The four requirements of yardstick competition, as mentioned in section 2.2, do exist in this sector. Since there is market failure, firms are comparable, have private and correlated information and output is verifiable. Furthermore, water companies are private companies and consumers pay for the product, so that the yardstick scheme is price cap regulated. The goals for regulating are: preventing monopoly rents, stimulating productive efficiency, realizing high quality products and high quality of service, customer protection and supply insurance (www.ofwat.gov.uk, 26 June 2007).

OFWAT uses comparative performance measurement, to introduce artificial competition among these regional monopolies. Relative performance determines the ceilings on what each company can charge. To implement yardstick competition, companies are ranked by percentage differences to the yardstick. Individual companies are ranked to an expenditure band A, B, C, D or E. When a company has a better cost performance than suggested by the models, it will be ranked as an 'A' company. Companies which are not as good as the models suggest it should be and their actual expenditure is above what is predicted, are called 'E' companies. The relatively inefficient companies, are expected to catch up with the leading companies over a period of five years. Therefore, the yardstick scheme has more impact on the relatively inefficient companies, than on the efficient ones.

Yardstick competition in this example is successful, in the sense that it prevents monopoly rents and stimulates productive efficiency. An advantage of yardstick competition is that this sector is characterized by an absence of dynamics, in the sense of unexpected fluctuations in demand or technology. Thus, the scheme can be improved over time, but will last over a longer period of time (CPB, 2000).

However, a main concern with the implementation of yardstick competition, is the impact on quality. The CPB (2000) states that more research is needed, to find out if adequate measures can be implemented, to guarantee quality. Since water is an industry where parts of the industry have characteristics of natural monopoly, it is unlikely that the industry faces competition on the level of customers and is not dynamic in the sense of demand, or rapid technological changes. So, potential disadvantages of yardstick competition seem relatively easy to meet, apart from quality concern.

Secondly, an example of the telecommunication in the US is presented. The Federal Communications Commission (FCC) regulates this. The FCC controls the pricing of the Local exchange carriers' (LECs) of access to their local telecommunications networks. The LECs hold dominant positions in their home telephone market. Many other providers of telecommunications services have to interconnect with the LEC to reach final customers. The public goals for regulating are: preventing monopoly rents, stimulating productive efficiency and making sure interconnection is achieved at reasonable terms (www.fcc.gov, 27 June 2007)

The FCC uses estimates of industry average productivity growth, to set price caps for interstate access services. Also, the FCC provides LECs with some flexibility in setting prices, by introducing service baskets. Here, prices of individual service elements are allowed to vary, as long as the weighted average of the prices does not exceed the price cap. Next, two of the four baskets are made up of service categories, to prevent that flexibility within the basket, leads to undesired behavior like predatory pricing. The historical trends of access charges may reflect developments in both costs and profits. The regulatory regime can have an effect on both variables, with weak incentives to improve efficiency leading to higher rates.

Hereby, yardstick competition is successful, since it enhances static efficiency. It clearly outperforms no regulation, because competition in local LECs is not completely established.

In the telecommunication, yardstick competition prevents monopoly rents and also realizes the other goals, like ensuring interconnection at reasonable terms.

Nevertheless, the major problem of yardstick competition, is the dynamic nature of the industry. This refers to both technological change and future possibilities for competition by alternative infrastructures, which are both hard to foresee. The possibilities of innovations in other sectors, which are indirectly linked to the telecommunication, are not taken into account. For example, innovation in the ICT could take advantage of the price regulation in the telecommunication sector. Thus, yardstick competition becomes vulnerable because of the dynamic nature of the industry and the potential for future competition (CPB, 2000).

Finally, an example of yardstick competition in The Netherlands is illustrated. Within the electricity network sector, the 'yardstick' is presented as a price-cap and described as a so-called 'high-powered scheme' (www.dte.nl, 31 July 2007). Hereby, an electricity company can achieve profit, when their efficiency is higher, compared to the average sector. Since every company attempts to remain as much profit as possible, the average efficiency increases. To prevent that the reliability of the electricity sector decreases, also regulation of quality exists.

The electricity company takes part in the decision to choose the yardstick, when it has proven to get rid of the historical inefficiencies. A company that cannot prove that its production remains more efficient, can choose to leave the reliability of the production constant and decrease the costs for the clients. Also, the latter company will become more efficient, so comparison becomes easier (Dte, 27 July 2007).

However, to compare electricity companies, is by far the most difficult aspect in the case of electricity network regulation. It is not possible to simply calculate average costs, as the individual company's costs may be driven by a series of company-specific factors. The ability to generate a valid yardstick, is a necessary precondition for yardstick competition to be successful. Failing to do so, would generate an unfair yardstick, that benefits some companies while harming others. Also, this creates ground, or legal procedures, to which a yardstick system is sensitive: one company's appeal has influence on all others. This increases unpredictability and ultimately reduces the effectiveness of the system (Ajodhia, 2002).

In table 2.2, an overview of the implementation of yardstick competition within different sectors are shown.

Table 2.2: Yardstick competition in different sectors

Sector	Country	Method of ranking the yardstick	Method of yardstick competition
Water industry	UK	Ranking based on different efficiency levels (level A - E)	'Price- cap'
Telecommunication	US	Ranking based on productivity growth	'Service baskets'
Electricity industry	The Netherlands	Ranking based on height of the powered scheme	' Price- cap'

2.7 Conclusion

Four requirements for the application of yardstick competition are important; some kind of market failure has to occur, comparability must be possible, the agents must have private information and the regulator needs to decide the relative efficiency of the agents. In particular, the second condition 'comparability', is hard to fulfill in the health care sector. This assumption notes, that the agents have to be largely similar with respect to technology, which is hard to accomplish with enormous variation of treatments between hospitals. This concern is related to the heterogeneity between hospitals, since differences within treatments are not included in the yardstick. This may have unfair consequences for hospitals. Especially hospitals that treat the relative more complex patients, like specialized hospitals.

The difficulty for success of yardstick competition, has also been shown with respect to the examples of industries, where this reimbursement system already has been introduced. The only application of yardstick competition in The Netherlands, is in the electricity distribution. The ability to compare electricity companies, is also said to be the most difficult aspect in this sector, for letting yardstick competition succeed. Next, even in a sector where the four requirements of yardstick competition do exist, like in the water industry in the UK, a main concern is the impact on the quality.

3. Research method

This chapter describes the research method of the empirical part of the study. The first section explains the research design. The next section illustrates the way how the validity and reliability of the study are sustained. The third section describes the data analysis of the research study. The final section shows a schedule of the way in which this research method serves the purpose of the study.

3.1 Research design

For the research design, a choice can be made between quantitative and qualitative data. To examine whether yardstick competition influences the financial position of the Eye Hospital, both qualitative and quantitative research are necessary.

The quantitative data are used to examine the benchmark, by experimental comparison of data. The benchmark is marked as quantitative research, since this method examines the conceptualization of the problem and the research question, in terms of an experimental comparison. This is based on interventions, or treatments with clear outcome variables in mind. Instruments of quantitative data collection, are for example questionnaires, standardized measuring instruments, ad hoc rating scales, or observation schedules (Punch, 2000).

The qualitative research is used as a primary study for the benchmark. Hereby, an ethnographic case study is done, focusing on interpretations and meanings in the literature and by experts. The question of instruments for qualitative data collection, is more contentious and difficult to summarize. The researcher is pointed out as the primary instrument for data collection and analysis. Qualitative data are mediated through this human instrument, rather than through other instruments (Punch, 2000). This qualitative data collection has been used for both the first and second chapter. Also, the first part of the empirical study, the collection of data gained from interviews, is based on qualitative research. To conclude, the study has quantitative as well as qualitative aspects.

3.2 Validity and reliability

In this paragraph, the validity and reliability with respect to the research, are stated. With validity, the results should match its questions and the arguments should be clear and internally consistent. Reliability is the ability of a person, or system, to perform and maintain its function in standard circumstances, as well as unexpected circumstances. Internal

reliability is related to the consistency of the procedure. External reliability is connected to the virtual repetition of the study (Punch, 2000).

The quantitative analysis, attempts to reflect a person's existing position and viewpoint. This can be misused to justify a course of action, for a research model that is decided previously, rather than used as a means to open up new possibilities. This can influence the validity of the study, because it could be possible, that a potential threat of yardstick competition for the Eye Hospital is examined, which depends on the opinion of one person only. To sustain a high validity of the research, the opinions of experts are taken into account, to judge which aspect must be examined in the benchmark.

To achieve a high internal reliability of the study, the researcher attempts to use the procedure and the theoretical definitions, as consistent as possible. The external reliability is achieved by a precise description of the data. For example, the interview reports are noted as accurate as possible.

3.3 Research model

The research model is divided into two parts; a quick scan and a benchmark. First, the data obtained from interviews are described. Secondly, the data analysis of the benchmark is explained.

3.3.1 Quick scan

For the research study, information is gained from interviews, which is summarized in a so called ´quick scan´. These interviews are semi-structured. Semi-structured interview schedules include mainly fixed questions, but with no response codes. They are used flexibly, to allow the interviewer to probe and to enable respondents to raise other relevant issues, not covered by the interview schedule (Bowling, 2002).

For the interviews, only the main actors in the health care sector are involved. The respondents are representatives of the NZa, the Department of Health ('Ministerie van Volksgezondheid, Welzijn en Sport', VWS), the interest group for Health Insurance Companies ('Zorgverzekeraars Nederland', ZN), the interest group for Hospitals ('Nederlandse Vereniging van Ziekenhuizen', NVZ) and the Erasmus MC (see annex I.).

3.3.2 Benchmark

Furthermore, the research study is based on the method of benchmarking. Benchmarking may be used as a learning process. If a hospital has followed the same procedure or practice for years, it may be hard to think of new ways to accomplish the task more efficiently. Benchmarking is often referred to as learning from the "best of the best". It provides an opportunity to learn how others have accomplished a task, in an efficient and effective manner. A concern of benchmarking can be, that people only observe the details and forget the bigger picture. A systems view is important. Observing and understanding the tools being used, is not enough. The bigger picture needs to be understood (Heaphy and Gruska, 1995).

The benchmark utilizes data-files of the Eye Hospital and seven general hospitals. Since the hospitals required staying anonymous, they are coded from A until G.

For the benchmark, different hospitals are chosen, to be able to approximate whether variations in volume and treated patients are signalized. The size of the hospitals differ in a range from 140 beds until 680 beds. Also, in the volume of treated patients, diversity does exist. For example, one of the approximated hospitals has treated 350,780 outpatients and 19,793 patients, who came for a first admission in 2006. In the same year, another hospital had less outpatients (16,000), but over 119,500 patients who came for a first admission.

From the seven hospitals, five hospitals participate in the same district as the Eye Hospital and two hospitals participate in another region. These latter two hospitals take part in a district with a range of many inhabitants. One hospital participates in a district with a population of over 280,000 people. The second hospital is located in a district with 200,000 habitants.

For the benchmark, the data-files are collected from 2006 and from eye care patients only. The sub-specializations of eye care, can be divided between retina, cornea, orbit, glaucoma, oculoplastic surgery, strabisme, cataract, and tear way.

Nevertheless, the sub-specialization cataract, is a treatment which is incorporated in the B-segment and from 2008, also oculoplastic surgery will be included in this segment. As mentioned in chapter 2, these kind of DBCs will not be included in the calculation of the yardstick. Therefore, these treatments are not used as measurement variables of the benchmark. Within the remaining sub-specializations a patient can be diagnosed for 18

different diagnoses[1], which are examined in the benchmark. In the benchmark, every diagnosis is described as a different patient stream.

3.4 Research schedule

In the following research schedule, a schematic view is presented of the way the research is stated.

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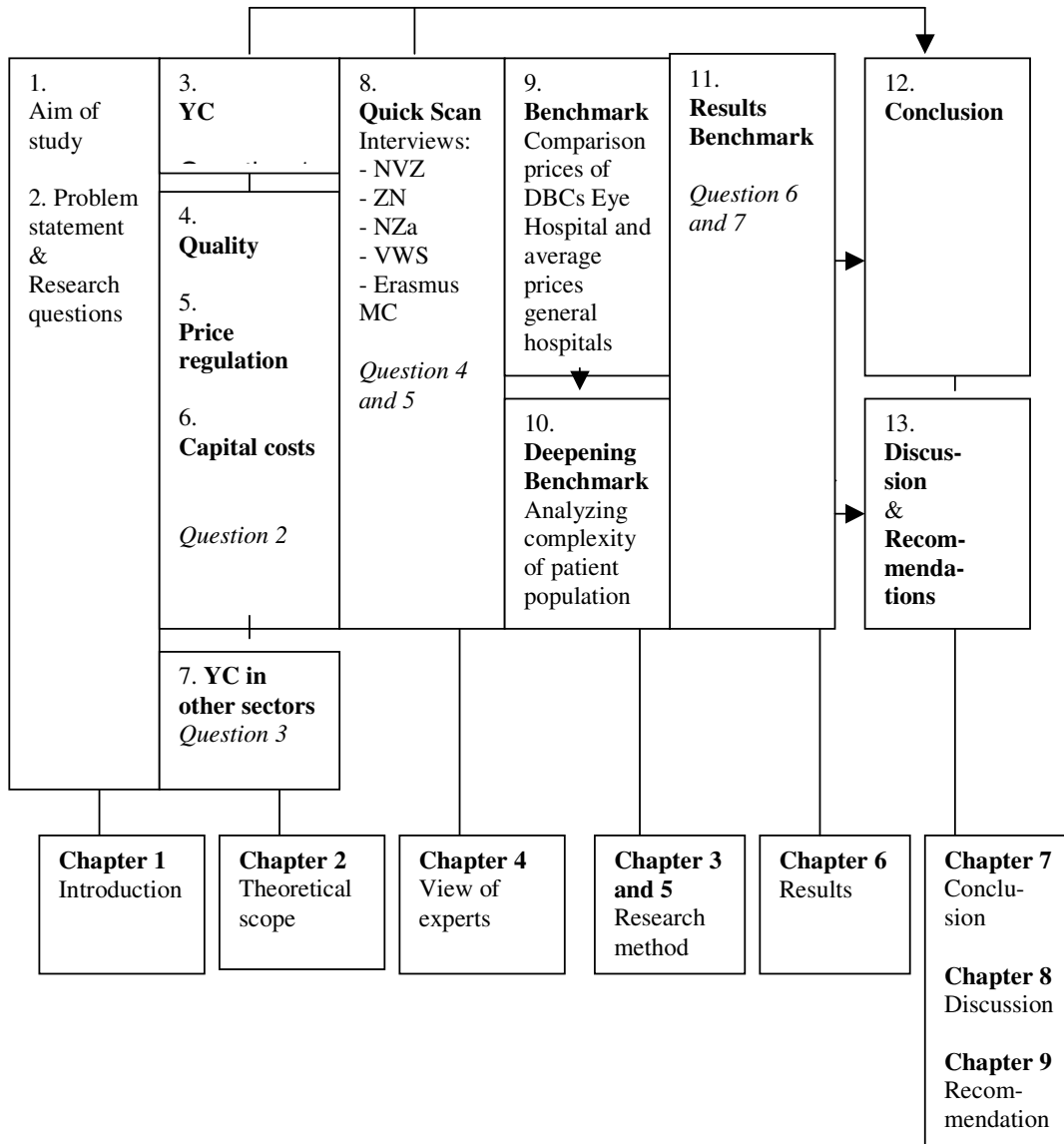
[1] The 18 different diagnoses are; No pathology, Vision/ Refraction, Strabismus, Eyelids, Tear way, Orbit, Conjunctiva, Cornea, Uvea, Lens, Vitreous humour, Retina, Diabetic Retina, Macula, Bulb/ Sclera, Neurology-ophthalmologie, Glaucoma and Remaining diagnoses.

Chapter 4 View of experts

In this chapter, the views of different parts of the field are stated. The goal of this 'Quick scan', is to find out what the different opinions with respect to yardstick competition are. In this chapter, the foundation of the study is given, which is important for the research study. As an illustration, in annex II an outline of the interviews is given and in annex III a schedule of the results is presented.

The first section describes the answers, that are related to the overall view of yardstick competition. Next, the expectations of the price regulation are lined out. The third and fourth section illustrate the opinions of the quality of health care and capital costs respectively. Finally, a description of the impact of yardstick competition on the policy and financial position of the Eye Hospital, is given.

4.1 Yardstick competition

The respondents of the Dutch Health Care Authority (NZa), the interest group for health insurance companies (ZN), the Department of Health (VWS) and the Erasmus MC, are positive towards the intention of the Minister of Health, to implement yardstick competition in the Dutch health care sector. Romme (NZa) says: *"Thanks to yardstick competition, production in the health care market will fit in with the demand of patients."*

Only the interest group for hospitals, (NVZ) is negative towards the plans. Nobels (NVZ) emphasizes three main reasons why they are opponents of this reimbursement system. First, she explains that yardstick competition is a very complex model, which is used as a final model in other sectors. A second disadvantage is that it causes much extra administration. Also, Nobels notes that this model makes health care uniform, because yardstick competition is based on average health care, with an average compensation.

Jansen (VWS) does not agree, that the model of yardstick competition is too complex. She mentions, that this model actually only provides a maximum to the price that hospitals may charge for DBCs. Next, Jansen emphasizes that the Minister of Health only wants to use yardstick competition as a temporary method, between the recent budget system and free prices. This choice is based on two reasons. First, the insurance companies get the opportunity to become more capable, to anticipate on the risks of a competition market. Second, the

efficiency between hospitals can become more equal, since the efficiency among hospitals is very diverse.

First, the ZN preferred a 'Big Bang': free prices at once. In spite of this, the ZN thinks a free competition market could be dangerous for small health care insurance companies, because especially these companies, can go bankrupt. After reconsidering this, the ZN is positive to the implementation of yardstick competition. Van der Rijst (ZN) says: "*Probably every part of the field says, that they prefer a ´Big Bang´, but in fact not every organization is ready for this.*"

Although the opinions, with respect to the effectiveness of yardstick competition, differ between the respondents, all respondents agree on one aspect; there is a high chance that yardstick competition will be introduced in the health care sector in January 2009. In spite of this, NVZ still presumes to prevent the implementation of yardstick competition.

The expectation of the respondents, about the introduction of the new reimbursement system, is most of all based on the fact that the Minister of Health gave 'the sign' to the NZa to organize the implementation of yardstick competition (see letter VWS '*Waardering van betere zorg*', 13 June 2007). Next, Van der Rijst (ZN) emphasizes the high political cover of the plans. Kamphuis (Erasmus MC) notes that implementation of an other model is not possible, mainly because the development of the ideas was very time-consuming. Both Van der Rijst (ZN) and Kamphuis (Erasmus MC), mention that the Minister of Health will lose his reliability, if the plans for yardstick competition will be delayed for the second time. Van der Rijst (ZN) says, that introduction of the new financial system only delays again, when the NZa is not finished in time.

Lakerveld (NVZ) thinks it is also possible that the B-segment increases annually, so introduction of yardstick competition becomes unnecessary. Like mentioned in chapter one, the B-segment increases from 10% to 20% in 2008. He states that in 2009 it is possible to enlarge the B-segment even more.

Romme (NZa) thinks the intensity of the many discussions with respect to yardstick competition, may be explained due to the fact that many hospitals have not been informed adequately. So, a lack of knowledge caused that much protest blaze up. Next, Van der Rijst (ZN) assumes, that the delay of one year for the introduction of yardstick competition, has three main reasons. First, the DBC-system is structured insufficiently, since it is not yet fully

identifiable by doctors. Secondly, the stability of the DBC-system is not equal in all the hospitals. So, the declaration doesn't take place in the same way in every hospital. Better registration takes place, when the ICT is improved within hospitals and also the registration of DBCs should be easier for doctors. Third, the relations in the health care sector are not equal. This can be considered to the fact that there is too little transparency. So, this makes the position of health care insurance companies weaker compared to hospitals. Van der Rijst (ZN) says, the Minister of Health achieves to work on these aspects within the next year, before yardstick competition is implemented. Kamphuis (Erasmus MC) states, that in the Erasmus MC they are glad that the implementation of yardstick competition has been delayed for one year. Her personal opinion, is that she had hoped that the Minister of Health decided to introduce it in 2008, as planned. She notes that not all the parts of the field will ever be completely ready for a new financial system.

To conclude, the respondents expect yardstick competition will be implemented in January 2009. Only the NVZ is against the plans of the Minister of Health and tries to prevent the introduction.

4.2 Price regulation

The Minister of Health has decided to implement the alternative variant of the NZa, so called sub variant. Jansen (VWS) explains that the Minister of Health chose for the alternative variant, since they assume it is not realistic to choose for the common method of yardstick competition in health care ('the principal variant'). First of all, the principal variant provides much more administrative burden for hospitals, because the hospitals should present much information annually. Also, she explains that in 2009 the NZa will use the data of 2007 to provide a yardstick in 2010, the data of 2008 in 2011 and so on. So, even when the yardsticks of hospitals would be updated annually, the NZa will stay behind with the annual correction of the yardstick.

The ZN is not glad that the sub variant is chosen, instead of the principal variant. According to Van der Rijst (ZN), the choice of the sub variant is based on a 'political game'. Due to the fact that in this variant the yardstick competition is fixed at the beginning of the period, it is more assured for the government to achieve savings in health care.

In the first place, also the employees of the NZa were disappointed that they advised principal variant, the traditional yardstick scheme, was not chosen by the Minister of Health. Romme

(NZa) emphasizes the principal variant is much more dynamic, compared to the sub variant. Nevertheless, he realizes that the change for hospitals in case of this variant is probably too big.

Since the goal of yardstick competition is to try out whether free competition works in the health care sector, the ZN emphasizes that the Minister of Health should leave the market free and only use a yardstick as back up to require safety. For this reason Van der Rijst (ZN) calls the sub variant an 'impure' variant and the principal variant a 'pure' variant. Van der Rijst says: *"The Minister of Health leans on two thoughts."* This means that on the one hand the Minister has the intention to figure out how the health care sector performs, when there is a free market. On the other hand he still wants to structure the market.

Also, Lakerveld (NVZ) does not have a positive opinion of the sub variant. The Minister of Health justified to choose this variant, so hospitals know what they can expect in the next four years. But according to Lakerveld, this is only to satisfy the hospitals in the first place, because the Minister of Health will still change the fees and discounts annually. He emphasizes that this is not fair towards the expectations of the hospitals. NVZ is not really an opponent of the yardstick the hospital has to deal with, but Lakerveld says it is not realistic to assume that hospitals can deal with the annual changes of fees and discounts.

Summarized, the Minister of Health has chosen for the sub variant of yardstick competition. ZN as well as NVZ are not satisfied with this decision. ZN noted that this choice is based on political reasons. Next, NVZ says the Minister asserts to provide hospitals a concession, by choosing this variant. The counter argument of NVZ is that the fees and discounts for hospitals will still be changed annually, so the restriction for the hospitals consists within this variant.

4.3 Quality of health care

"You do believe in competition or you don't", was the reaction Jansen (VWS) gave, when she was asked whether yardstick competition has a positive or negative influence on the quality of health care. Thus, she notes it will increase the quality.

Also, ZN emphasizes that the quality of health care increases, as a result of the implementation of yardstick competition. First, Van der Rijst (ZN) says it is not necessary to fear for the quality. Yardstick competition will be an incentive for innovation in hospitals,

which results in higher quality. Secondly, he underlines that the society does not permit to receive low quality. Third, hospitals will be motivated more to make the quality of the health care within their hospital transparent. Next, Kamphuis (Erasmus MC) agrees it is very important for hospitals to make the quality of health care transparent. She notes: *"It will no longer be the question if hospitals make their quality of health care transparent, but how they do it."*

An interesting statement was the reaction of the NZa. Romme (NZa) agrees that hospitals have to make their quality transparent. He hopes that the quality will increase, but he says it depends on the way the doctors notice the upcoming transparency of the quality.

To recapitulate, the Department of Health and the interest group of insurance companies assume the quality of health care will increase, thanks to yardstick competition. Nevertheless, the transparency of the quality within a hospital is very important.

4.4 Capital costs

Both Romme (NZa) and Van der Rijst (ZN) believe it is a logical intention of the Minister of Health, to include the capital cost of hospitals in the DBCs of yardstick competition, because in every other sector it is completely normal to do this. Lakerveld (NVZ) is also very satisfied about including capital costs in the DBCs. He emphasizes that capital costs have an indirect effect on the efficiency of hospitals.

To conclude, the respondents reacted positively towards the intentions of the Minister of Health, to include the capital costs in the integral prices.

4.5 Yardstick competition versus the Eye Hospital

The respondents were asked, whether yardstick competition has impact on the policy and financial position of hospitals, in particular the Eye Hospital.

The impact of the policy on the Eye Hospital

ZN notes, that the impact of yardstick competition on the policy of hospitals will be huge. The structure of the hospitals has to change completely, which will be followed by a change in the culture. Before, the focus of the hospitals was mainly on maximization of the budget. Now the policy will concentrate on the performance of hospitals.

Besides, Kamphuis (Erasmus MC) emphasizes that hospitals have to work much more flexible and realize that fluctuations in productions do exist. This means, that contracts and investments, must depend more on the economic situation of the hospital.

Next, Romme (NZa) states, it is very important that hospitals deliver secure data of the complexity of their treatments. Also, hospitals have to be aware whether their prices of DBCs, in combination with the volume, correspond to the yardstick, the NZa has imposed to the individual hospital. He did not want to pursue the matter further, to specify his answer to the Eye Hospital.

Lakerveld and Nobels (NVZ) note that it is important for hospitals to have their processes structured and to standardize the treatments. Both aspects are often already of a high level in a specialized hospital. So, they expect the Eye Hospital has already recognized where the weak parts of the hospital remain.

In general, several experts assume, it is important for the Eye Hospital to be aware of the variation of patient streams between hospitals. Next, the hospital should take the relative weights of DBCs into account, that the NZa will attribute to every DBC. When the Eye Hospital knows the variation in patient streams between hospitals and the relative weights, which are related to every patient stream, it may be interesting to reconsider the focus of patients, to stay ahead of the competition after yardstick competition is introduced.

The impact on the financial position of the Eye Hospital

Romme (NZa) explains in the 'yardstick', the variation *between* DBCs in hospitals will be taken into account, but not the possible variation *within* DBCs, that differ between hospitals. The latter difference of complexity is not included, because the NZa does not have the precise information and they assume that hospitals have to treat patients within a DBC equally. In addition, Jansen (VWS) says the relative weight is not yet included in DBCs, but this is a goal to achieve, before yardstick competition will be implemented. When this is not achieved, she assumes a compensation for hospitals with a high complexity of patients is provided.

According to Lakerveld (NVZ), the impact of yardstick competition on the position of the Eye Hospital, will mainly be related to the extent, to which the relative weights within DBCs are not taken into account. This will be of major impact to the Eye Hospital, because their patient population can exist of more difficult patients. Through this, the prices of DBCs of the Eye Hospital may become higher. Also, Van der Rijst (ZN) notes that especially for specialized hospitals, it is extremely important that the relative weights of DBCs will be included.

Also, Van der Rijst (ZN) believes that hospitals will improve the performance of the hospitals by specializing. This will be achieved by innovations. ZN emphasizes that especially specialized hospitals are in a good position, since they can stand out with relative high quality. The Eye Hospital has to make the quality within the hospital transparent, to show how they distinct from other hospitals.

Jansen (VWS) resumes, yardstick competition has impact on both the internal management as well as on the transparency of the quality of health care, to anticipate on the reforms. The goal of the internal management in the Eye Hospital, will no longer be related to maximizing the budget, but to improve the efficiency within the hospital. Also, the quality has to be transparent, so the Eye Hospital can prove what they provide and remain their position in the health care market.

4.6 Conclusion

To conclude, the experts expect that the impact on the policy of the Eye Hospital is relatively low, because a specialized hospital often has structured and standardized the treatments better at forehand compared to general hospitals. But in addition, a respondent noted that it becomes very important to work more flexible and deliver secure data of the complexity of the treatments. Also, the Eye Hospital is advised to examine the variation in patient streams, to be aware of the differences in patients that hospitals treat.

However, the impact of yardstick competition on the financial position of the Eye Hospital, is expected to be high, compared to general hospitals. The main reason for this, is that relative weights within DBCs, are not (yet) taken into account. This may have unfair consequences for some hospitals. Since especially specialized hospitals treat the relative more 'heavy' patients, the fact that this aspect is neglected in yardstick competition, may be more noticeable. According to this, several respondents emphasize, the position is stated by the transparency of the quality of health care, within the Eye Hospital.

Chapter 5 Benchmark

In this chapter, two assumptions are stated that conceptualize the possibilities, in which way yardstick competition may influence the financial position of the Eye Hospital. The assumptions are made by the researcher and summarized from the information, which is derived from both the theoretical analysis and the quick scan. After the explanation of the two assumptions for the benchmark is given in this chapter, the results will be presented in the next chapter.

The first assumption, is that yardstick competition does take the weights of relatively more complex treatments, into the calculation of the yardstick, by a product mix index which is explained in chapter 2. This is described as the difference *between* DBCs. Since these weights of a specific treatment are not yet known, it is impossible to participate in this. What is possible though, is to compare the variation in the patient streams of the Eye Hospital, versus the approximated hospitals by the benchmark. So when the relative weights per DBC are known, the Eye Hospital knows on which patient streams they should focus, in order to receive a high production mix index, whenever yardstick competition is introduced. Hereby, the benchmark examines what type of variation between hospitals exists in the diagnoses of the patients, who have been treated. This variation is illustrated, by the differences between the hospitals, in the amount of patients which are treated per diagnosis. Moreover, in the results, the number of patients is related to the total amount of the treatments within every individual hospital. They have chosen for the number of treated patients, because in the calculation of the yardstick this is utilized as well (see section 2.5.1). Therefore, the graphs for the first assumption presents the variation of patient streams between the hospitals.

The second assumption, is that with the introduction of yardstick competition, the government does not take the heterogeneity of health care into account. The reason for this hypothesis is that in this new reimbursement system, differences *within* a DBC are not taken into account (see section 2.5.1 and section 4.6). This means that yardstick competition does not look at the relative complexity of the population from a specific DBC. Thus hospitals that may treat more severe ill patients, in comparison with other hospitals, do not receive a compensation for this. Since the Eye Hospital is a specialized hospital, they assert to have a more complex patient population in comparison with general hospitals. If this hypothesis is true, this may influence

the financial position of the Eye Hospital. Thus, in the second assumption, the benchmark examines, whether differences within the complexity of the patient population between the Eye Hospital and other hospitals exist. For this assumption, the statement is made, that the complexity of a patient population can be related, to the fact that a patient is referred from another hospital; tertiary referred patients (Folland, 2007). This statement is made, because it shows whether a hospital has top-clinical treatments within its specialty of eye care. Summarizing, this part of the study examines whether the group of tertiary referred patients, instead of regular patients, provides higher costs for the Eye Hospital.

The benchmark illustrates this second assumption in different steps. First of all, the amount of tertiary referred patients of the different hospitals are presented. This shows whether a hospital has top-clinical treatments within its specialty of eye care. Secondly, the costs of the patients who are tertiary referred are calculated. Hereby, only the costs of patient streams with the highest amount of referrals are calculated[2].

In order to calculate the revenues and the costs of the patient streams, who are regular and tertiary referred, two different aspects are important to take into account;

1. Every patient stream has different categories of diagnoses within its sub-specialty. For example, whenever a patient is diagnosed with the sub-specialty strabismus, a variation of three types of strabismus exists. Moreover, to every type of strabismus, different costs are related. So if the costs of referrals for a specific diagnosis are calculated, this distinction must be taken into account as well.

2. Different treatments are possible for every diagnosis, like medical or surgical treatments. Moreover, within surgical treatments, a distinction can be made. For example, within surgical treatments, six different types of surgical treatments are possible. Similarly, for every type of surgical treatment, differences in costs exist. Therefore, in order to calculate the costs of tertiary referrals, these differences in costs are taken into account as well.

To conclude, in the benchmark two different aspects are examined. First, it presents the differences between DBCs, by illustrating the variation in the patient streams from hospitals. Secondly, the benchmark shows whether differences within DBCs exist. Hereby, the extra costs of these DBCs are shown, by presenting information of the differences in revenues versus costs for patients, who are tertiary referred.

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[2] Since the cost prices of DBCs of a hospital have to stay as secret as possible, only the total cost prices of the three treatments with the highest amount of tertiary referred patients are presented.

Chapter 6 Results Benchmark

This chapter illustrates the results of the benchmark, which represents a comparison between the Eye Hospital and the seven approximated hospitals. The first section presents the variation in patient streams between the different hospitals. First, the variation in treated patients of medical treatments is presented in the graphs, characterized as 'conservative treatments'. Following, the variation in patient streams for surgical treatments are shown, which are typified in the graphs as 'operative treatments'. The second section illustrates the amount of tertiary referred patients to the hospitals. Moreover, this latter section gives an impression whether tertiary referred patients provide extra costs, by comparing the costs of the patient streams that have been tertiary referred with the costs of regularly referred patients.

6.1 Variation in patient streams

As explained in chapter 5, the first assumption is that yardstick competition does take the relative weights of treatments into the calculation of the yardstick. In order to show whether this assumption is relevant for the financial position of the Eye Hospital, differences between patient streams are presented in this section.

First, graph 6.1 is shown to illustrate the variation of the patient streams within the Eye Hospital.

Graph 6.1: Patient streams in the Eye Hospital (2006)
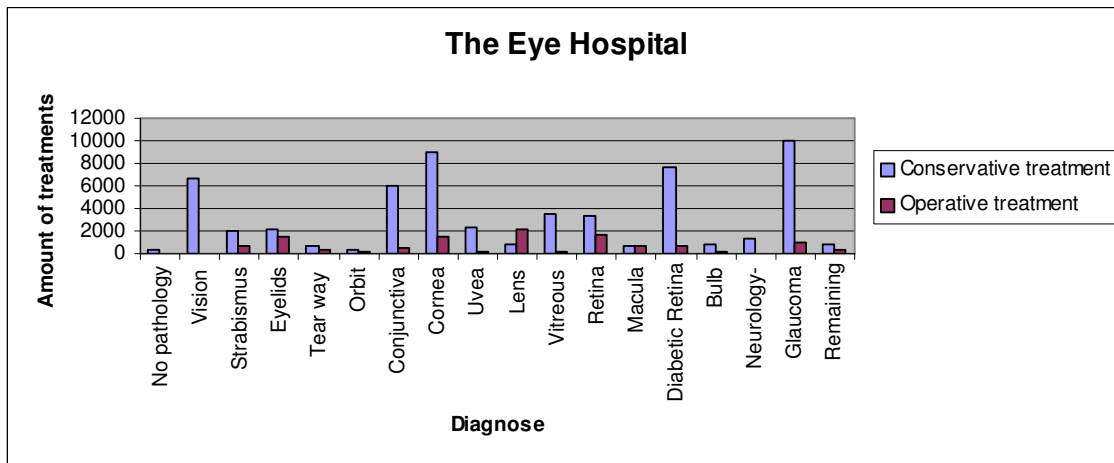
In graph 6.1 differences in the amount of patient streams of the eighteen possible diagnoses are presented. As the graph shows, for some diagnoses many patients and for other less patients are treated. Especially for cornea, diabetic retina and glaucoma, patients are mostly treated in the Eye Hospital. Moreover, a distinction in medical versus surgical treatments is

made. As illustrated in the graph, the Eye Hospital treats much more patients medically than surgically.

To conceptualize the question in what way a variation in patient streams between the Eye Hospital and other hospitals sustains, the next graphs show whether differences in the amount of patients per diagnosis are visible. In the following graphs, a distinction between medical and surgical treatments is made.

Graph 6.2 illustrates for every patient stream the distinction in the amount of medical treatments from the Eye Hospital, versus the seven approximated hospitals. In order to visualize the amount of patients per diagnosis from the approximated hospitals, the average amount of treated patients per diagnosis from the seven hospitals are used.

Graph 6.2: Benchmark of the volume in medical treatments (2006)
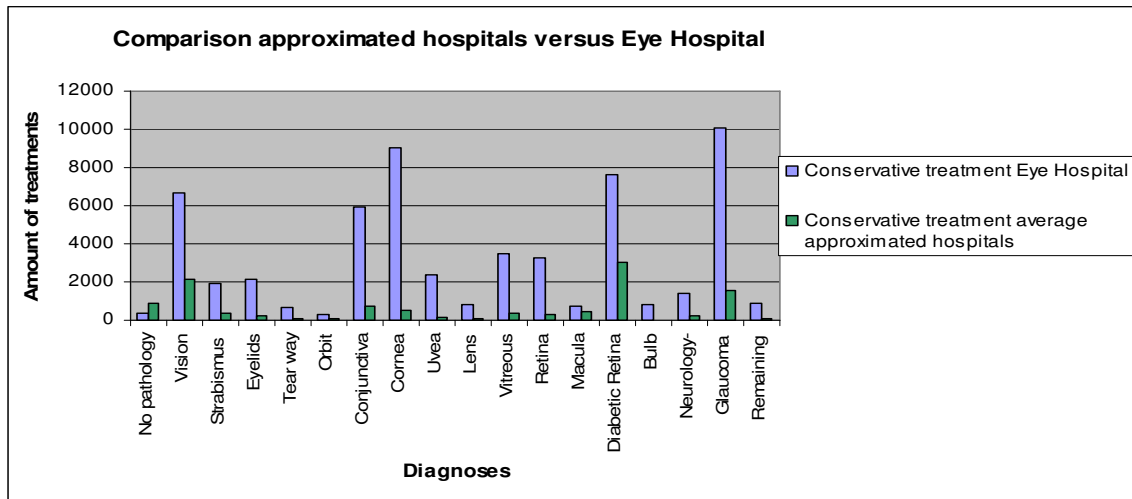
This graph shows, that the amount of treated patients in the Eye Hospital, is higher in comparison with the average amount of treated patients in the approximated hospitals. Especially for three specific treatments (cornea, diabetic retina and glaucoma), the Eye Hospital treats a high amount of patients.

Following, in graph 6.3 the tariffs per DBC are added to the volume of the treated patients, which makes that the revenues of the medical treatments can be shown.

Graph 6.3: Benchmark of the revenues for medical treatments (€)
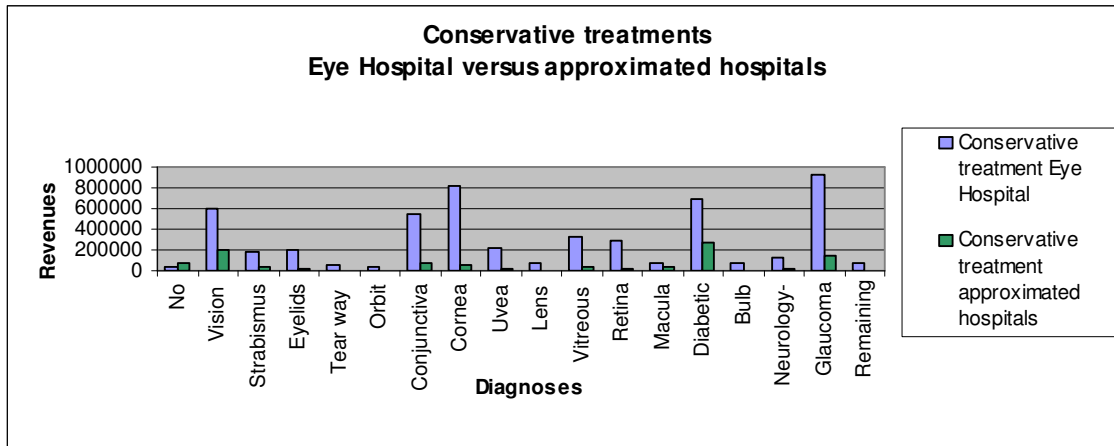
Graph 6.3 shows, that even if the revenues of the medical treatments are added to the volume of every patient stream, also the diagnoses cornea, diabetic retina and glaucoma are pointed out to contain the highest bars per diagnosis in the graph.

This graph is not only used to show the variation of the Eye Hospital versus the approximated hospitals, but due to this graph, the selection is made of the three medical treatments with the highest amount of patients. To scope the next sub section, only the variations in the amount of treated patients per hospital of the three selected diagnoses are shown.

Since not only the medical treatments are important, the variation in patient streams for the surgical treatments is shown as well. In graph 6.4 the amount of treated patients in the Eye Hospital, is compared to the average amount of treated patients in the seven approximated hospitals.

Graph 6.4: Benchmark of the volume in surgical treatments
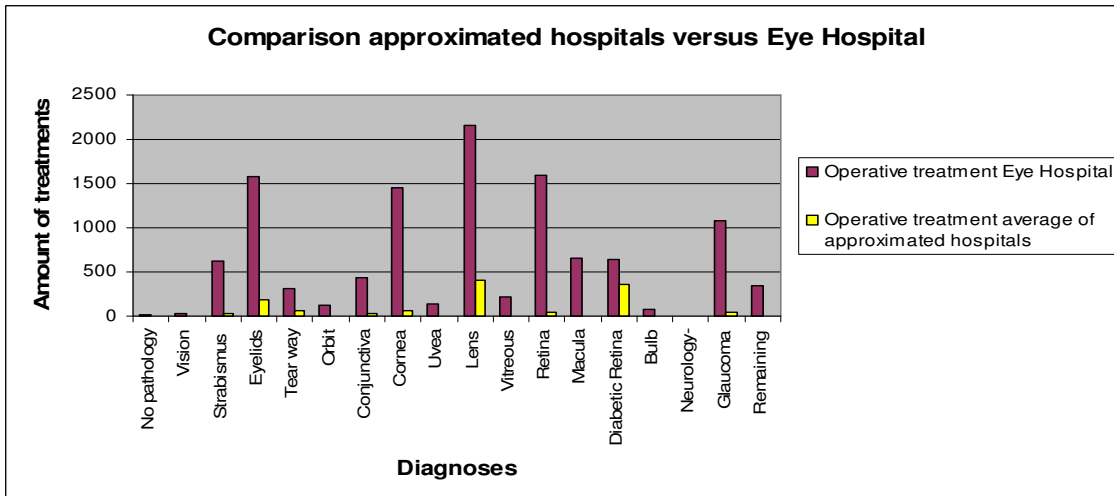
As illustrated in graph 6.4, on average the seven hospitals do not contain a high amount of surgically treated patients. Moreover, the highest bars of surgical treatments are for a treatment on the eyelids, the lens, or the retina. The graph also shows, that for these diagnoses, more than 1,500 patients were treated in the Eye Hospital in 2006.

Furthermore, also for the surgical treatments, the revenues are calculated and presented in a graph (see graph 6.5).

Graph 6.5: Benchmark of the revenues for surgical treatments (€)
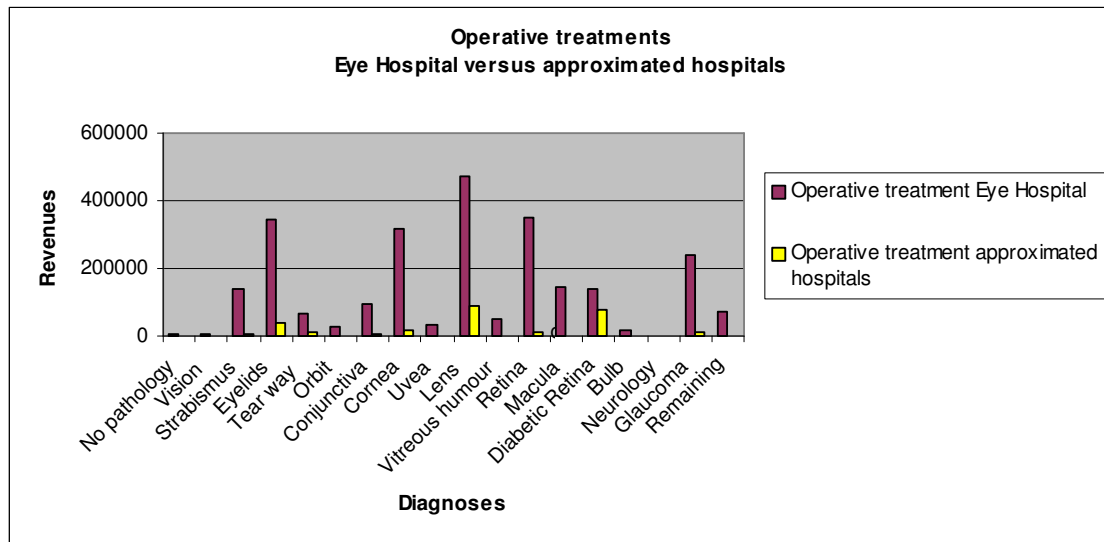
Graph 6.5 shows the variation in the revenues of every patient stream, between the Eye Hospital and the general hospitals. After multiplying the gross revenue by the volume of every patient stream, the highest bars in the graph of patient streams for surgical treatments, still remains for the diagnoses eyelids, lens and retina.

To conclude from the latter four graphs, a selection in patient streams can be made, in which a high variation between the Eye Hospital and an average of the seven approximated hospitals exists. Since the representation of an ´average´ amount of seven hospitals may misrepresent the actual variation in treated patients, the graphs in the following two sub sections will represent the variation of the hospitals separately. In order to shorten the amount of graphs, only the variation in patient streams of both medical and surgical treatments the three patient stream will be shown that have been treated the most. As shown in graph 6.2 and 6.3, for medical treatments the three patient streams are glaucoma, cornea and diabetic retina. Following, as shown in graph 6.4 and 6.5, the surgical treatments for eyelids, lens and retina are found to have the highest amount of patients. Therefore, the variations in patient streams

of these six diagnoses between the eight hospitals are shown. The variations in the amount of patient streams between the hospitals of the remaining diagnoses are illustrated in annex IV.

6.1.1 Medical treatment

This sub section shows the variation in patient streams for medical treatments between the Eye Hospital and the seven different hospitals separately. First, the variations between the hospitals in the amount of treated patient with glaucoma are presented (see graph 6.6). Secondly, graph 6.7 shows the percentage of the treated patients for glaucoma. In order to calculate the percentages, the amount of patients per diagnosis is related to the total amount of medical treatments of the specific hospital. For example, in the Eye Hospital in total 58,456 patients have had a medical treatment in 2006, from which 10,049 patients received a treatment for glaucoma by a medical method. This means that 17.19% of the patients was diagnosed for glaucoma and treated non-surgically within the Eye Hospital.

Graph 6.6: Benchmark treated patients for glaucoma
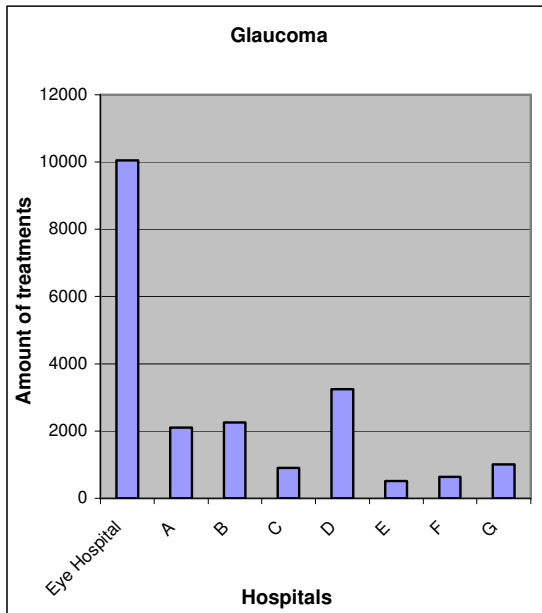
Graph 6.7: Benchmark in percentages of treated patients for glaucoma of the total medical treatments
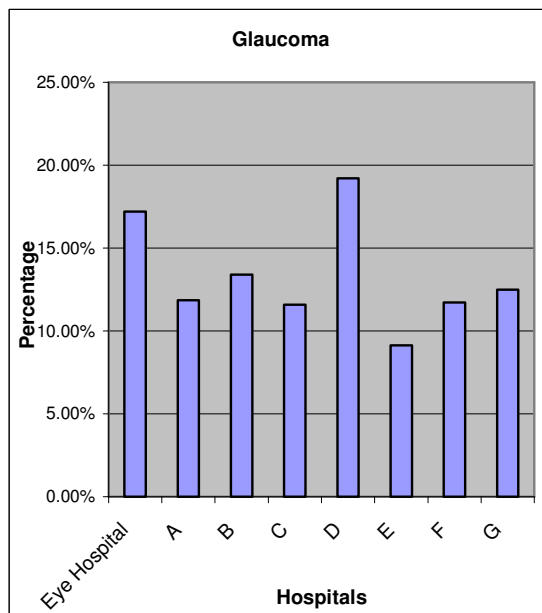

Graph 6.6 shows that the Eye Hospital treats many more patients with glaucoma, in comparison with the seven other hospitals. The hospital that treats the second highest amount of patients with glaucoma is hospital D. Yet, the difference in the amount of treated patients with glaucoma between the Eye Hospital and hospital D, is still nearly seven thousand patients per year.

Moreover, graph 6.7 shows that within hospital D, nearly 20% of the patients, who are treated medically, are treated for glaucoma. Also, the difference between the hospitals in the percentages of patients that are treated for glaucoma by the hospitals individually, is about 10% between hospital D and E.

Also note, that the two graphs above, present a comparison of the amount of patients, who were regularly referred from the general practitioner. It does not highlight how many of these patients were referred to the Eye Hospital in a regularly way, but could also be classified as more complex, like tertiary referred patients. For example, the general practitioner signalized it is a 'heavier' patient from the start and is familiar with the Eye Hospital. So, the amounts of treated patients are all regularly referred patients, but maybe not all have the same complexity.

Graph 6.8 shows that the distinction in the amount of treated patients between the Eye Hospital and the other hospitals, can even be higher. Here, two graphs show the variation in cornea patients between the eight different hospitals.

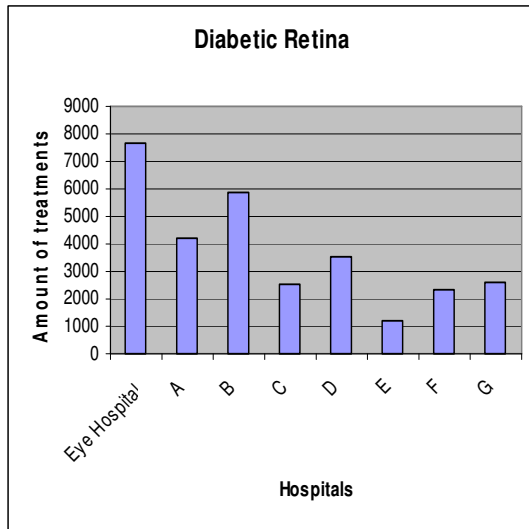Graph 6.8: Benchmark treated patients for cornea
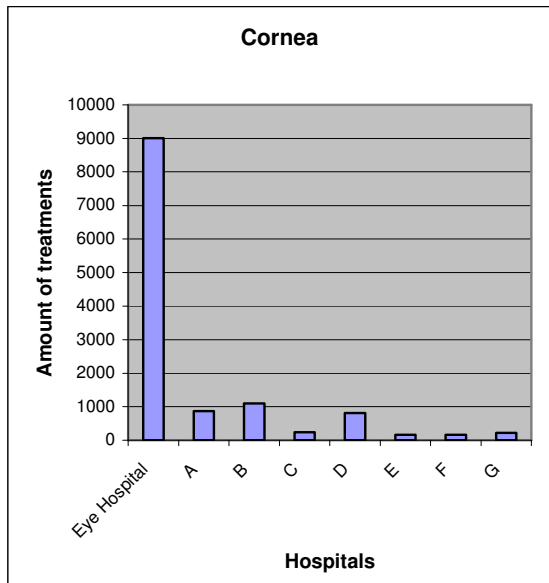
Graph 6.9: Benchmark in percentages of treated patients for cornea of the total medical treatments
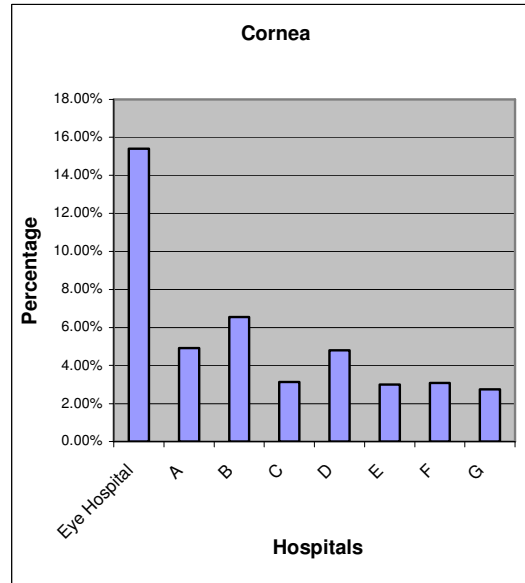

As illustrated in graph 6.8, the amount of treated patients for cornea in other hospitals is very low in comparison with the Eye Hospital. Hereby the difference between the bar of the Eye Hospital and the second highest bar, hospital B, is over eight thousand patients. Following, graph 6.9 shows that the Eye Hospital treats relatively more patients as well.

Continuing, the variation in patient streams between the hospitals, is presented for diabetic retina. Graph 6.10 shows the difference in the amount of patients that are treated for diabetic retina and graph 6.11 shows the relative impact of this diagnosis per hospital.

Graph 6.10: Benchmark treated patients for diabetic retina

Graph 6.11: Benchmark in percentages of treated patients for diabetic retina of the total medical treatments
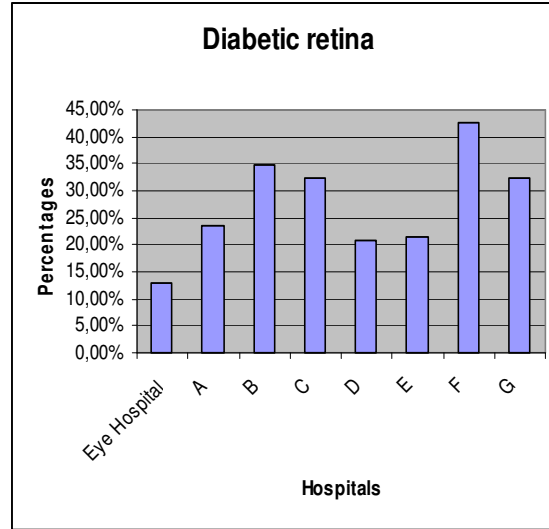
Graph 6.10 shows that the variation between the hospitals in patients who are treated for diabetic retina is smaller, in comparison with the variation in patients who are treated for glaucoma and cornea, respectively graph 6.6 and 6.8. As illustrated in graph 6.10, Hospital A, B, and the Eye Hospital have treated more than 4,000 patients for diabetic retina in 2006. Moreover, graph 6.11 shows that the medically treated patients for diabetic retina in most hospitals include a relatively high fraction of the total amount of the medical treatments.

Summarized, the graphs illustrate that for the three diagnoses, glaucoma, cornea and diabetic retina, the Eye Hospital treats a higher amount of patients in comparison with the other seven hospitals. Moreover, the Eye Hospital also has relatively the highest percentage of cornea patients, who are treated in a medical way. Nevertheless, the graphs in relative percentages, showed that the patients who had a medical treatment for glaucoma and diabetic retina in the approximated hospitals, appear to be nearly the same as, or even higher, than the Eye Hospital.
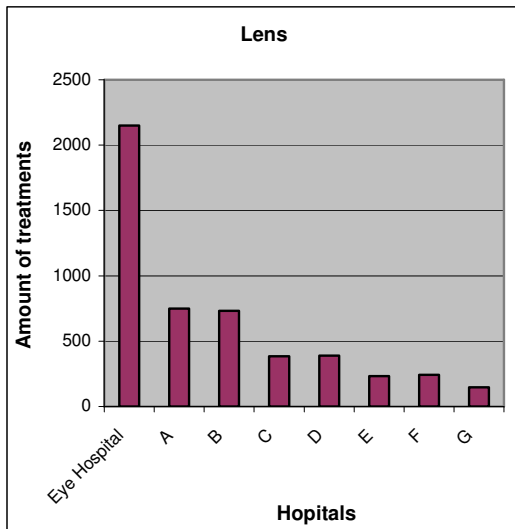
6.1.2 Surgical treatments

This section shows the variation within a patient stream for the surgical treatments. As mentioned before, hereby the distinction in the amount of treated patients for lens, eyelids and retina are illustrated.

First, graph 6.12 shows a comparison of patients, who are diagnosed to be treated on their lens. Secondly, in graph 6.13 the relative percentages of patients per hospital are presented.

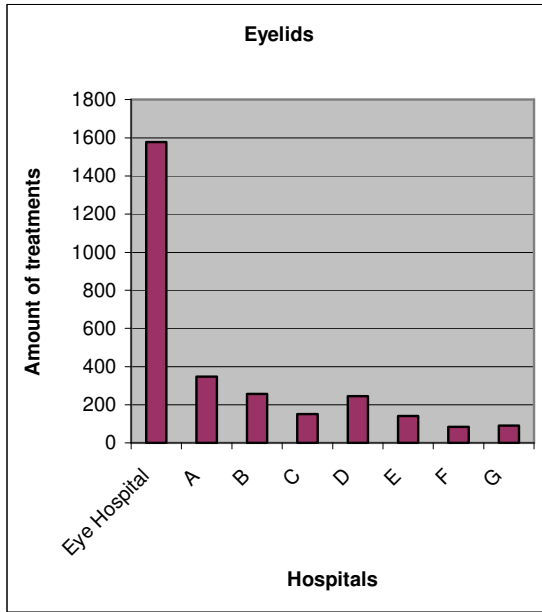Graph 6.12: Benchmark treated patients for lens

Graph 6.13: Benchmark in percentages of treated patients for lens of the total surgical treatments
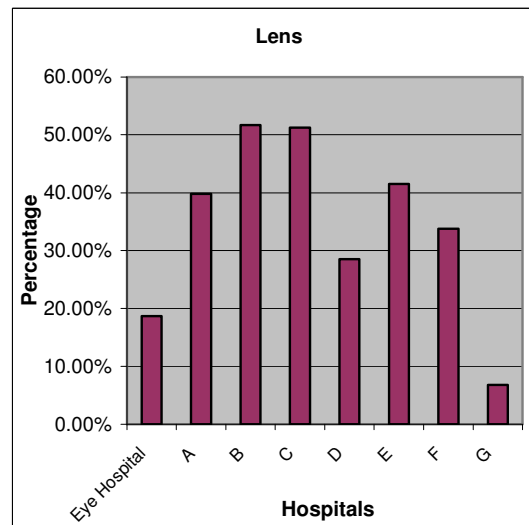
Graph 6.12 shows that a high amount of patients who undergo an operation on their lens, are treated in the Eye Hospital. Furthermore, hospital A and B treat a high amount of patients for this diagnosis. In addition, the amount of patients within the Eye Hospital, is nearly 20%, which is relatively small, when it is compared to the percentage within most of the other hospitals (see graph 6.13).

Graph 6.14 and 6.15 show respectively the variation in the amount of patients who have had a surgical treatment on their eyelids and the relative percentage of the amount of patients.

Graph 6.14: Benchmark treated patients for eyelids

Graph 6.15: Benchmark in percentages of treated patients for eyelids of the total surgical treatments
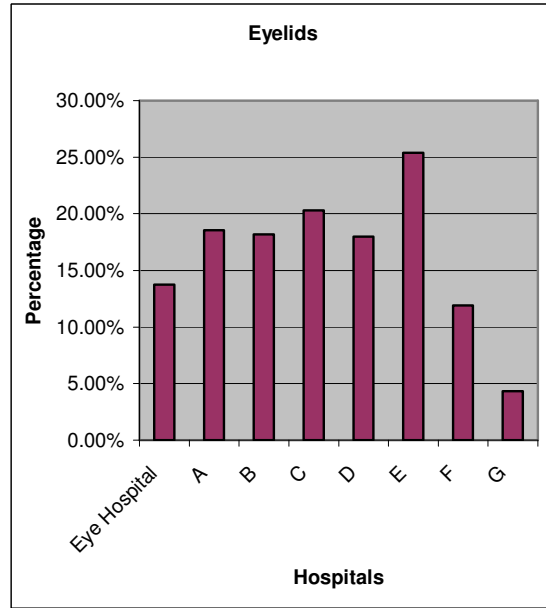

Graph 6.14 illustrates that the Eye Hospital treated a much higher amount of patients on their eyelids, than in the other hospitals. Moreover, the graph shows that Hospitals F and G only treated a little amount of surgical patients for this specific diagnosis. Nevertheless, graph 6.15 shows, that for hospital F in comparison with hospital G, this amount of patients is relatively higher.

Finally, the last two graphs present the variation in hospitals in the amount of patients, who have had an surgical treatment for problems on their retina.

Graph 6.16: Benchmark treated patients
for retina
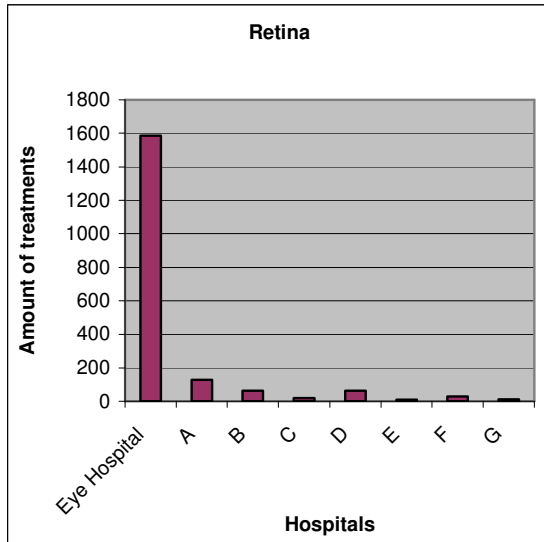
Graph 6.17: Benchmark in percentages of treated
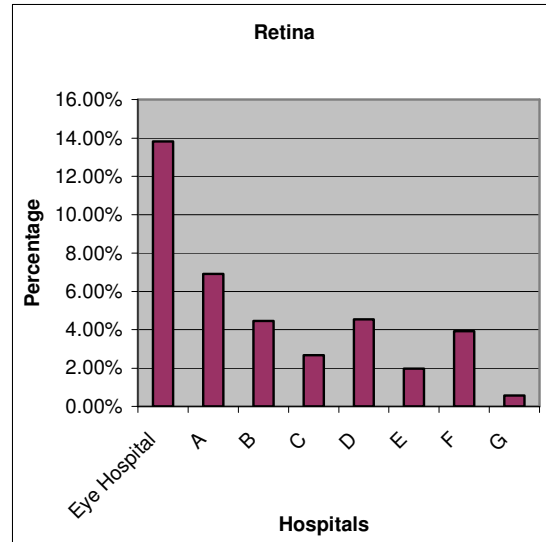patients for retina of the total surgical
treatments

Graph 6.16 presents an extreme difference, between the seven approximated hospitals, versus the Eye Hospital; the other hospitals treated less than 100 patients, whereas the Eye Hospital treated more than 1,600 patients for retina in 2006. Also, graph 6.17 shows that the percentage of patients, who were treated for retina, is relatively higher for the Eye Hospital in comparison with the other seven hospitals.

To conclude section 6.1.2, the graphs show that for the three diagnoses, lens, eyelids and retina, the Eye Hospital treats a much higher amount of patients surgically, in comparison with the approximated hospitals. Also, the Eye Hospital treats relatively the highest percentage of patient for retina in a surgical way. But for the lens and the eyelids, most of the general hospitals treat a higher percentage of patients.

So, section 6.1 in general, shows that the case mix profile of the Eye Hospital versus the approximated hospital, are very diverse. To illustrate, the total amount of patients who are treated in the Eye Hospital and the proportion of patients who are treated in the approximated hospitals, both medical and surgical treatments, are presented by two pie-divisions to summarize the discrepancy of the earlier graphs of this section (see pie-division 1 and 2).

Pie-division 1: Case mix profile Eye Hospital
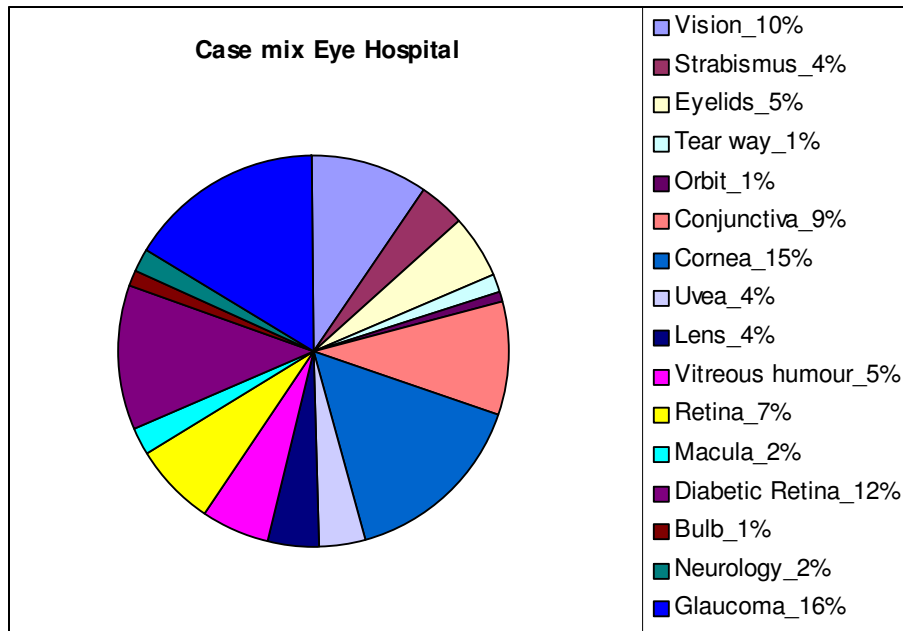
Pie-division 2: Case mix profile general hospitals
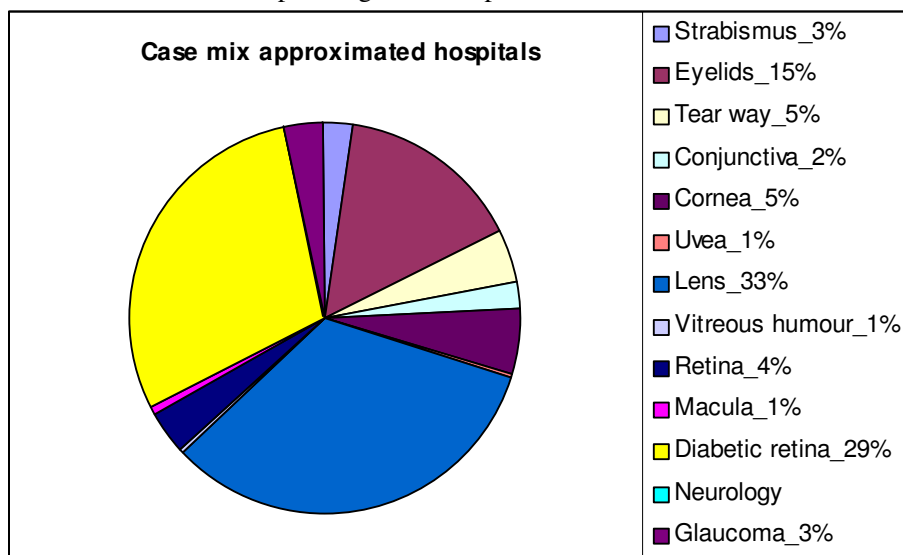
As presented in the two pie-divisions, the case mix profile between the Eye Hospital and the seven general hospital, is very diverse.

6.2 Tertiary referrals

The second assumption highlights that the plans of the Department of Health, to implement yardstick competition, omits the relative complexity of patients. This section shows whether this might influence the financial position of the Eye Hospital. Hereby, the hypothesis is formulated, that the complexity of the patient population of a hospital, may be related to the amount of patients that have been referred by other hospitals. In order to examine whether this group of patients bring extra costs, the costs of these patients are calculated in the next sub section.

The seven approximated hospitals were asked to deliver their data of tertiary referrals. All of the seven hospitals answered that they have not, or very minimally, received patients in 2006 that were referred by another hospital. As a result, none of the hospitals have registered any tertiary referred patients.

However, the Eye Hospital does receive tertiary referred patients. Since they are a specialized hospital, patients are frequently referred to this hospital (see graph 6.18). The patients who are referred tertiary are surgically treated patients only, which are often complex patients.

Graph 6.18: Referred patients from general hospitals to the Eye Hospital (2006)
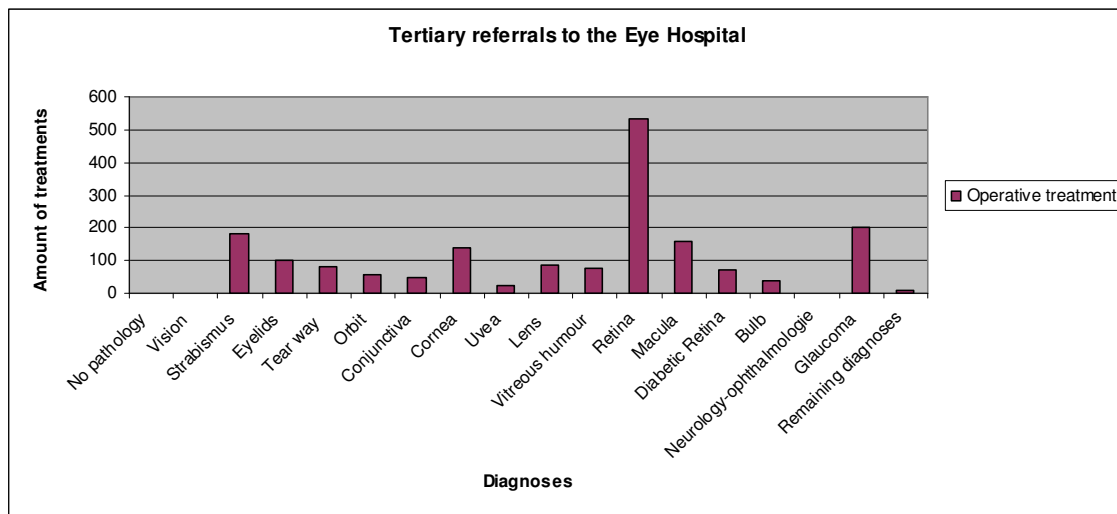
As shown in graph 6.18, the Eye Hospital often received patients with a tertiary referral, who have been diagnosed for retina, glaucoma and strabismus.

6.2.1 Costs tertiary referrals

The costs of the patients who were tertiary referred for the three diagnoses retina, glaucoma and strabismus are calculated, in order to show the costs for the Eye Hospital for these patient

streams. First, the terminology of revenues and costs will be explained, because these terms are used frequently in this section. With the gross revenues, the reimbursement by the health insurance companies to the hospital are meant. As explained in chapter 1, this is related to the DBC-code that is attributed to the health care process of the patient. By costs, the cost prices for a DBC, multiplied by the volume from a hospital are meant. These are the total costs, the hospital makes in order to treat this patient stream, for a particular health care process (Corbey and Hulst, 2005).

Before the revenues and the costs of tertiary referred patients are calculated and compared, it is important to be sure that the comparison is based on the same facets. In particular, the foundation of the revenues as well as the costs, are based on two parts; the hospital component and the capital costs. The hospital component includes the cost prices of a DBC, based on the health care activities. The average gross revenues, the starting point of the NZa, are related to the year 2004 and are composed by the cost prices per DBC from thirteen hospitals. An explanation of the construction of the cost prices by these thirteen hospitals, will be presented later in this section. Aspects which are included in the cost prices, are for example the use of medicine, the duration of stay of patients and indirect resources. Also, a percentage for the capital costs is included in the revenues, as well as in the costs. Within the DBC prices, 12% is required for capital costs. From the 12%, a fixed percentage of 8% is included for capital costs, because the NZa assumes that the remaining 4% of capital costs are already captured, by the deduction of the inventory of DBC-prices. So, the NZa wants to prevent, that a percentage of the capital costs is double counted, which they call the 'level playing field' (DBC-onderhoud, 2007).

As explained in chapter 5, in order to calculate the total revenue from a diagnosis, a distinction of several categories within a diagnosis have to be made. This means, that for the calculation of the total costs of the three diagnoses, both the costs of the amount of patients per category of a sub-specialty and the costs per type of surgical treatment, have to be calculated. First, the revenue of every different type within a diagnosis is calculated. Secondly, to calculate the costs of applying a surgical treatment, a distinction is made between outpatients and patients for a day-admission.

Table 6.1 presents the calculation of the total revenue with respect to a diagnosis; it shows that differences of the revenue from a DBC, may exist within a diagnosis as well as within an surgical treatment.

Table 6.1: Calculation of the gross revenue the Eye Hospital received for tertiary referred patients (2006)

Diagnoses	Surgical treatment					
	Outpatients			Patients for day-admission		
	Volume in Eye Hospital	Revenue per DBC composed by NZa (€)	Total gross revenue Eye Hospital (€)	Volume in Eye Hospital	Revenue per DBC composed by NZa (€)	Total gross revenue Eye Hospital (€)
Retina						
- Type 1	0	219.50	0	0	2,064	0
- Type 2	328	219.50	71,996	162	2,350	380,700
- Type 3	1	219.50	219.5	0	2,064	0
- Type 4	5	219.50	1,097.5	2	2,064	4,128
- Type 5	28	219.50	6,146	5	2,064	10,320
Revenue			*79,459*			*395,148*
Glaucoma						
- Type 1	2	219.50	439	0	2,064	0
- Type 2	125	351.50	43,937.5	5	2,064	10,320
- Type 3	56	351.50	19,684	8	2,064	16,512
- Type 4	4	219.50	878	2	2,064	4,128
Revenue			*64,938.5*			*30,960*
Strabismus						
- Type 1	79	1,049	82,871	0	2,064	0
- Type 2	103	1,049	108,047	0	2,064	0
- Type 3	2	1,049	2,098	0	2,064	0
Revenue			*193,016*			*0*

As table 6.1 shows, retina can be subdivided over five different types of retina diagnoses. The revenues of treatments for outpatients, on behalf of retina over the five sub-diagnoses, appear to be the same. Next, the table presents that within the revenues for day-admission for retina, the revenue that a hospital receives for type 2, is higher than for the other types. Also, the table shows, that this type has been tertiary referred most frequently. After calculating the total revenue of the outpatients (€79,459) and the total revenue of patients for day-admission (€395,148), the total revenue that the Eye Hospital received for retina-patients who were tertiary referred, in total was €474,607 in 2006.

Next, table 6.2 presents information of the revenues versus the costs per diagnosis. In the first column the diagnosis and in the second column the total amount of patients per diagnosis is

shown, which are tertiary referred to the Eye Hospital. In the third column the total revenues are presented, that the Eye Hospital received per DBC in 2006. Since the revenues are the same for both regularly and tertiary referred patients, only one column of revenues is presented in the table.

Next, the table shows the costs[3] per patient stream. The fourth column presents the scenario of the total costs for regularly referred patients, which illustrates the costs the hospital have had if the patients, instead of tertiary referred, were regularly referred. So, this column does not present the actual total costs of the regular referrals for the three diagnoses in 2006, but the costs that the Eye Hospital would have had, if they did not receive tertiary referred patients. Therefore, to calculate the total costs for regularly referred patients, the volume of tertiary referred patients in 2006 are also used, for the volume of the regular patients. And, as mentioned before, the tertiary referred patients are treated surgically, so the costs of the regularly referred patients are also the costs of surgical treatments for regularly patients, in order to fulfil the comparison.

Finally, in the fifth column the actual total costs of the tertiary referred patients per diagnosis are given, which are made by the Eye Hospital.

Table 6.2: Costs for the Eye Hospital in 2006 (€)

Diagnoses	Total amount	Total revenues	Scenario of total costs of regular referrals	Total costs of tertiary referrals
Retina	531	474,607	1,489,060	1,777,761
Glaucoma	202	95,899	367,689	479,580
Strabismus	184	193,016	453,177	444,830
Total	**917**	**763,522**	**2,309,926**	**2,672,171**

Table 6.2 shows a big difference between the total revenues and the costs, both for regularly and tertiary referred patients, within the Eye Hospital. Also, differences between the costs of diagnoses and type of referrals are signalized. The table shows, that the tertiary referred patients who are diagnosed for retina, have the highest costs, in comparison with the other two patient groups. Moreover, the table shows that in spite of the fact that fewer patients are treated for strabismus, in comparison with glaucoma, the total revenue the hospital receives

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3 Since the cost price per category of a diagnosis and per treatment of the Eye Hospital have to stay undisclosed, only the total costs are presented.

for patients with strabismus, is higher than for the patients with glaucoma. Nevertheless, the total costs of the patient stream with strabismus, is also higher than the total costs of the patients with glaucoma.

Following, the revenues, which are presented in table 6.2, are shown in graph 6.19.

Graph 6.19: Gross revenues and costs of patient streams for the Eye Hospital (2006)
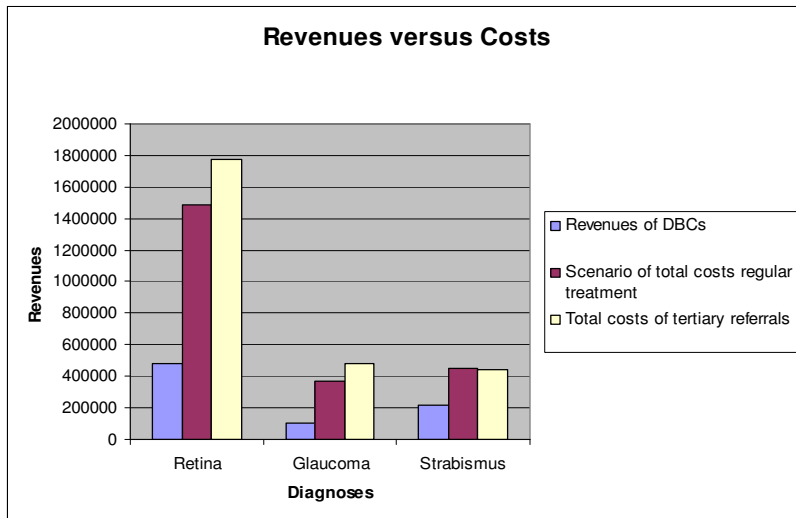
Graph 6.19 shows, that the total costs for the Eye Hospital are the highest for retina-patients. As shown in the graph, the Eye Hospital has received nearly 500,000 euro reimbursement for the patients who were tertiary referred and diagnosed for retina in 2006. Moreover, this patient stream brings high costs; the group of tertiary referred retina patients provoke total costs of nearly 1.8 million euro. So, the total loss, difference between the total reimbursement and the total costs for this category of tertiary referred patients, were over 1 million euro. The graph shows that both the glaucoma- and the strabismus-patients caused a loss.

Furthermore, the graph shows, that both tertiary referred patients who are diagnosed for retina or glaucoma, tend to have higher costs for the Eye Hospital, in comparison with patients who have been referred in a regularly way. While the graph also shows that for a strabismus-patient, a little positive outcome is signalized for the patients who are tertiary referred, in contrast to the patients who are regularly referred.

To conclude, first of all, a relatively big difference is signalized, between the revenues hospitals in general receive for a DBC, in comparison with the costs the Eye Hospital has for the diagnoses retina, glaucoma and strabismus. Secondly, for the diagnoses retina and

glaucoma, the tertiary referred patients are more expensive than the regularly referred patients.

To explain why the difference between the revenues that the NZa has composed and the costs of regular patients within the Eye Hospital are this high, some possible explanations will be summarized.

First of all, the revenues are based on costs from a central 'route' of information, which is called the 'Centrale Gegevens en Analyse Omgeving' (CGAO). This method is chosen by the Department of Health in 2003 (www.nza.nl, 22 December 2007). The data of the CGAO is based on data of cost prices and health profiles from thirteen general hospitals in The Netherlands. So, these thirteen hospitals gave the input of the revenues, a hospital receives for a treatment. The thirteen general hospitals are chosen, since they are seen as hospitals, which participate among the 'leaders' of the hospitals in The Netherlands and proceed within every specialization (www.prismant.nl, 21 December 2007; DBC-onderhoud, 2007). Nevertheless, for some specializations, a very minimal amount of patients are treated. For example, the thirteen 'CGAO hospitals' have treated only circa forty retina-patients in total, in the foundation year. This is a big difference in comparison with the more than 4,000 patients on average, that the Eye Hospital treats per year (see table 6.1).

Following a report by Prismant, the next comments are made about the composition of the gross revenues for DBCs. Also, these comments are partly an explanation for the big difference between the revenues and the costs of the treatments within the Eye Hospital, that are shown in table 6.2. First of all, Prismant notes, that the reimbursed costs to a hospital, are based on uniform cost prices. Due to lack of time and the absence of complete data, it was not possible to provide DBC-prices for reimbursement, that are specifically related to every individual hospital. Secondly, a comment is that the Department of Health assumed, that the national cost prices would not increase after the DBC-system was implemented. Since the costs of treatments within the Eye Hospital and most general hospitals did increase, the discrepancy became even wider. The reason that the costs did enlarge, may partly be explained since the costs need to be corrected for inflation and the competition in the market increased, which influences the costs. Third, Prismant highlights the fact, that the tariffs are not representative to the total volume of DBCs and the CGAO method uses incomplete health care profiles, because they used the health care profiles of thirteen approximated hospitals only (www.prismant.nl, 21 December 2007).

So, a first reason to explain the big differences between the revenues and the costs of regularly referred patients (see table 6.2), is because the NZa and Department of Health used the CGAO method to provide the revenues for treatments for as well as the Eye Hospital and general hospitals, while the case mix of patients are very different.

Secondly, a reason is that the decision of a general practitioners to refer his patients to a specialized hospital, or a general hospital probably differs by the type of complexity of patients. So, since the Eye Hospital is a specialized hospital, it is most likely it receives more complex patients by the general practitioner, which are more expensive.

The third reason relates to the explanation that the health care profiles within general hospitals and the Eye Hospital differs by the method of its treatment. In particular, the reason for the large loss the Eye Hospital has for its retina-patients, is because of differences in the method of treatment. Since a general hospital treats its retina-patients surgically by a 'laser technique', whereby this method is only used as a temporary solution within the Eye Hospital. In the Eye Hospital the retina-patient receives a next treatment which may be categorized as a method, that is a continuation on the laser technique. While the reimbursement for a retina-patient, is based on the cost prices and health profiles of general hospitals, differences in health profiles is for this patient stream a justification for the big difference between the revenues and costs for the Eye Hospital for a retina-patient (www.zorgbeleid.com, 20 December 2007; Jaardocument, 2007; Street, 1999).

A fourth reason for the big differences between the revenues and the costs, which are shown in table 6.2 and graph 6.19, could be due to differences in the way the capital costs are included. Nevertheless, in the reimbursement for a DBC and in the costs for a DBC within the Eye Hospital, a fixed percentage of 12% is included for the capital costs (DBC-onderhoud, 2007; Jaardocument, 2007). So, this latter explanation does not fulfil the clarification of this big discrepancy that is shown in the table, between the revenues and the costs for the Eye Hospital for the three patient streams.

Also, differences between the costs of regularly referred, versus tertiary referred patients are shown in the results of table 6.2. The reason for this may be, because the tertiary referred patients are often more complex. To explain why the relatively more severe ill patients are frequently more expensive, several reasons will be highlighted.

First, in some cases the duration of the operation for more complex patients is longer, which results in higher costs. Secondly, complex patients often need a different sort of narcosis.

Since every kind of narcosis is labeled to a different price, this also influences the price for more complex patients. Third, more severe ill patients need extra research. For example, tertiary referred patients frequently need extra pictures of the eye(s). Fourth, this group of patients asks for more time, for both the consult in advance and the revision. Finally, a difference between both types of referred patients is that the chance for a repeat-treatment is higher for tertiary referred patients (www.zorgbeleid.com, 20 December 2007).

Furthermore, especially differences exist, between regularly and tertiary referred retina and glaucoma patients. The costs for strabismus patients are nearly the same. This may be explained, since the market share for the Eye Hospital of strabismus within the health care market is relatively small (see table 6.3) and the health care profile within this specialization is less diverse. Only three different types of strabismus exist and this is often for outpatients, the treatment of a patient for this diagnosis may be categorized as a 'standard' treatment (www.zorgbeleid.com, 20 December 2007). Therefore, differences in the costs between regularly and tertiary referred strabismus-patients, are less visible.

Table 6.3: percentage of market share per eye specialization

	Total general hospitals	Total academic hospitals	Average of one academic hospital	Total Eye Hospital
Retina	14%	60%	7,5%	26%
Cornea	28%	47%	5,8%	25%
Glaucoma	35%	49%	6,1%	16%
Orbit	40%	34%	4,3%	25%
Strabismus	72%	20%	2,5%	7%
Tear way	73%	17%	2,1%	10%
Cataract	90%	5%	0,6%	5%

Also note, that table 6.3 shows the percentages of market share of inpatient treatments, whereby the diagnosis for admission is familiar. For example, the table shows that for the diagnosis retina in total, 14% of the patients are treated in a general hospital, 60% in a academic hospital and 26% in the Eye Hospital. Since 8% from the population of The Netherlands lives in the region of the Eye Hospital, the table illustrates that a high percentage (circa 18%)[4] of the patients for retina comes from outside the region (OZR, 2007). An assumption is that this latter percentage of the patient population are relatively more complex patients. This means that the Eye Hospital not only has a high percentage of retina-patients

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[4] Total percentage of patients who are treated for retina is 26%, wherefrom circa 8% comes from inside the region and 18% from outside the region.

who are tertiary referred, but also from outside the region. This may be a next explanation for the high costs, the Eye Hospital has for this patient stream.

Also, the table shows, that the percentage of patients who are treated in the Eye Hospital for strabismus, is relatively small (7%). This assumes that most of the patients are from inside the region. After taken into consideration that the type of treatments for strabismus-patients is less diverse, this explains why this hospital has more 'standard' patients for this diagnosis and less extreme costs, in comparison with the retina-patients.

To summarize, big differences between the gross revenues and the costs of treatments within the Eye Hospital are shown in the results of this section. Also different reasons are given to explain this gap. Firstly, because health care profiles and cost prices of only thirteen general hospitals are included in the CGAO, and whereas the profiles and costs differ from the Eye Hospital in a various ways. Also section 6.1 showed, that the case mix between the Eye Hospital and general hospitals is very different. Next, because the Eye Hospital has the status of being a specialized hospital, this hospital may receive more complex patients in comparison with a general hospital.

Furthermore, differences in the costs between regularly and tertiary referred patients are shown. This is related to the reason that tertiary referred patients are often more complex, which brings extra costs. Examples for these extra costs are given as more research, revisions and repeat-treatments for tertiary referred patients.

Chapter 7 Conclusion

This section describes the conclusions, which are based on the outcomes of the different parts of the study. After discussing the seven research questions, an explanation is given to the problem statement of this study: *"How does yardstick competition influence the financial position of the Eye Hospital Rotterdam?"*

1. **What is yardstick competition?**

Yardstick competition is a regulatory instrument that can be used if direct competition between agents does not exist, or does not lead to desirable outcomes. This method is implemented in a market to overcome the information problems faced by the regulator. Under yardstick competition prices of individual companies are made dependent on the performance relative to others.

When yardstick competition is introduced in the Dutch health care sector the requirement of 'comparability' will be difficult to fulfil. This aspect of yardstick competition states that hospitals have to be largely similar with respect to 'technology', but this is hard to accomplish with enormous variation of treatments between hospitals.

2. **What are the intentions of the Department of Health to introduce yardstick competition in the Dutch health care sector?**

The minister of Health wants to implement yardstick competition to regulate the Dutch health care sector by price cap regulation for a transitory period. In the period from 2009 until 2011, the Department of Health will introduce the yardstick by annual steps of 25%. Since the sub variant is chosen, the yardstick for the whole transitional period for every specific hospital will be calculated at once. So, the data of one year is the starting point for the calculation of a specific hospital that will be used for the entire transitional period of yardstick competition. Next, Minister Klink has planned to abolish the volume restriction. To conclude, the price caps calculate the revenue cap function that is maximally allowed to charge and therefore the hospitals are responsible for their total charges.

3. **How is yardstick competition managed in other sectors?**

In The Netherlands, yardstick competition has only been implicated in the electricity distribution. Hereby, the yardstick is presented as a price-cap and described as a so-called 'high-powered scheme'. An electricity company can achieve profit when their efficiency is higher compared to the average sector. Also, yardstick competition has been implemented in

the water industry in the UK and in the telecommunication in the US. In all the three sectors, difficulties in the success of yardstick competition has been shown. Next to the complexity of the ability to compare the technology between agents, also in other sectors than in health care, concerns about the impact on the quality of the products has been highlighted.

4. <u>Which aspect of yardstick competition do experts expect to cause more consequences for the Eye Hospital in comparison with general hospitals?</u>

The experts emphasize that implementation of yardstick competition in the health care sector is very complex. The main reason is that in this sector the composition of treatment methods in hospitals and the heterogeneity in health care play a major role. Next, the experts assume that the chosen price scheme of yardstick competition will have different consequences and a higher influence on the financial position for the Eye Hospital, in comparison with the general hospitals. The main reason for this, is that the relative weights within a DBC will not be taken into account in yardstick competition. So, a patient population with a complex case mix is not compensated completely. Since the experts presume that the Eye Hospital treats relatively more severe ill patients, they expect this results into a high impact of the financial position of the Eye Hospital.

5. <u>How do the experts recommend keeping the Eye Hospital ahead of the competition?</u>

The experts expect that a specialized hospital has structured and standardized the treatments better at forehand compared to general hospitals. Since it will be even more important to have transparent health care processes when competition increases, they suppose that this may resolve in positive outcomes for the Eye Hospital. Also, several experts emphasize that the position in the health care market is stated by the transparency of the quality of health care within the hospital. In particular, the experts assume it is important for the Eye Hospital to be aware of the variation in patient streams between hospitals. After the Eye Hospital knows the distinction in patient streams and the relative weights the NZa has attributed to the diagnoses, the hospital should participate on this. So, a DBC to which a high weight is contributed and relatively a high amount of patients are treated within the Eye Hospital, it may be interesting for them to specialize on.

6. <u>In what way is variation in patient streams of the Eye Hospital versus general hospitals signalized?</u>

The benchmark of chapter 6 showed that the case mix of the Eye Hospital and the general hospitals is very diverse. Hereby, differences are noted in the amount of patients that are

treated and in the relative percentage of the patient streams per hospital. Concluded from the results of the benchmark, from the medical treatments the Eye Hospital treated in 2006 especially more patients with glaucoma, cornea and diabetic retina compared with the general hospitals. Also, the benchmark showed that for a surgical treatment in particular, the Eye Hospital treated a high amount of patients on the lens, the eyelids and for retina.

The variation in patient streams for both medical and surgical treatments was less visible in the analysis of the relative percentage of a patient stream that is related to a specific hospital, compared with the nominal differences which are very large. Nevertheless, for a medical treatment of cornea and the surgical treatment of retina the Eye Hospital also treats a relatively higher amount of patients.

7. <u>Does the price regulation of yardstick competition have different consequences for the Eye Hospital compared to general hospitals?</u>

The results of the study showed that the price regulation of yardstick competition has different consequences for the Eye Hospital compared to the approximated hospitals. Hereby, the study took the assumption into account that yardstick competition omits to take differences within a DBC into account. For a general hospital this will in particular remain in consequences for their financial position when they treat complex patients. As the study illustrated, the Eye Hospital was the only hospital that received tertiary referred patients. Also, the results of the benchmark showed that the total costs within the Eye Hospital for the tertiary referred patients were higher than the total reimbursement it received.

Since the NZa based the revenues on the health care profiles and cost prices of thirteen general hospitals, this differs from the profiles and costs that are made by the Eye Hospital in many ways. First of all, the case mix between the Eye Hospital and general hospitals is very different. Next, because the Eye Hospital has the status of being a specialized hospital by general practitioners and patients, it receives more servere ill patients in comparison with a general hospital. Also, the Eye Hospital uses for some patient streams different, and more expensive, treatments than a general hospital does.

Problem statement: <u>How does yardstick competition influence the financial position of the Eye Hospital Rotterdam?</u>

Since it is difficult to compare the case mix between hospitals, this will result in complications when yardstick competition is implemented. A main problem of yardstick competition for hospitals, in particular specialized and top-clinical hospitals, will be that differences within a DBC are not taken into account. So, especially the relatively complex

patients will have a negative influence on the financial position of hospitals. This shall result in higher consequences for the financial position of the Eye Hospital, in comparison with general hospitals. For example, a diagnosis for which a patient is tertiary referred provides high costs for the hospital, but these costs are not compensated within the yardstick. While this type of patient has not been referred to the approximated hospitals in the benchmark of the study, the tertiary referred patients result in extra costs for the Eye Hospital.

Also, the product mix index presumes whether a hospital is permitted to ask a high maximum of the average price that the hospital is allowed to ask for a DBC. Therefore, after the NZa makes the relative weights of the DBCs public, the Eye Hospital may focus on treatments for which they treat relative many patients and at which a high weight is related to its DBC. Concluded from the benchmark, the Eye Hospital should mainly focus on medical treatments of cornea and surgical treatments of retina. Nevertheless, the conclusion for the latter diagnosis is only interesting when the DBC weight for the product mix index takes the high costs for this patient stream into account.

Chapter 8 Discussion

In this chapter the results from all parts of the study – literature review, interviews, benchmark – are combined and discussed. First, the discussion of the benchmark is presented. Next, the discussion of the methodology and the policy implications are described.

8.1 Discussion of results

First of all, weaknesses of the study will be mentioned. The first section of chapter 6 has aspects which may be mentioned as a weakness of the benchmark. Hereby, the graphs present how many patients of a diagnosis are treated by a hospital. In these graphs only the regularly referred patients are selected. Although all patients in the graphs of section 6.1.1 and 6.1.2 are referred primary, still differences in complexity between the patients may exist. Since the Eye Hospital is a specialized hospital and familiar with relative more severe ill eye-patients, probably the general practitioner takes this into account by his referral. So, on the one hand the graphs does look at the type of referral and the diagnosis of the patient, but on the other hand the bars in the graph do not illustrate whether the patients have a similar complexity. In the graphs of section 6.1 probably diversity in complexity of the regular patients do exist, which the bars do not present.

Next, the huge discrepancy that was presented between the revenues versus the costs in section 6.2, was based on the costs within the Eye Hospital only. The calculation shows that the more severe ill patients, patients who are tertiary referred, are more expensive than the regularly referred patients within a specialized hospital. So, the question remains what differences would appear with the costs of the treatments, if the more severe ill patients are also treated in the general hospitals.

Also, strengths of the study may be mentioned. First, as an advantage of the benchmark may be highlighted that the patients are filtered by both diagnosis and type of referral. So, the selection is very precise. Next, a strength of the study is that the benchmark showed whether the cost prices of the most frequently tertiary referred patients are higher than the costs of regularly referred patients. Hereby the researcher was allowed to show the total costs within the Eye Hospital of three diagnoses only. The decision on which three diagnoses the calculation was based, was selected by the patient streams who were tertiary referred to the Eye Hospital most frequently (see graph 6.18). So, although the costs of only three patient

streams was presented, the selection for the calculation of the costs of the tertiary referred patients was well considered.

Next, a strength of the study is that data of in total eight hospitals are compared in the benchmark. Since the CGAO used thirteen hospital to make up the cost prices of diagnoses on which the reimbursement of revenues for hospitals are based, the benchmark of this study is quit near this amount. Nevertheless, the CGAO did not use data of a specialized or top-clinical hospital, and the benchmark of this study did. So, this study gives a good impression of the reality of the divergence in case mix between hospitals.

8.2 Discussion of methodology

In this study, different research methods are applied in order to obtain the best results. After a literature review and interviews, a benchmark is performed. The outcomes are shown with a carefully selected sample size of eight hospitals, from which two were approximated from different regions. Furthermore, the benchmark is based on direct input from data and the results are presented anonymously.

However, there are some critics to assign towards the methodology of the study. First, the benchmark does not yield generalizable results for the Dutch health care, because the size of the sample is from a statistical point of view quite small. Nevertheless, for the Eye Hospital itself an advantage of the benchmark within the study is that it gives a high degree of information, because the seven approximated hospitals differ in volume, treated patients or region in comparison with the Eye Hospital. Secondly, it is crucial for the representativeness of the benchmark that only eye care is taken into account, while in yardstick competition the yardstick is calculated by all the specializations of the B1-segment within health care (see table 2.1). So, merely an enclosed answer of the two stated assumptions from chapter 5 is possible to present, if all the specializations were included.

The reforms in the health care provision have been discussed frequently in The Netherlands. Also, the introduction of yardstick competition has been followed by all parts of the field. As a result, various reports and articles have been published about this topic in relation to pros and cons of this new reimbursement system. The role of both the theoretical analysis and the quick scan of this study, lie in the presentation of the diverse views of experts in the field, who wrote about yardstick competition. So, the contribution of the results of this study counts for the hospitals in general. Also, the study can be used for hypotheses in follow-up studies of

yardstick competition. For example, a study will be appropriate to benchmark the impact for general hospitals, which do receive tertiary referred patients. So, the researcher may examine the impact of the costs of tertiary referred patients, but hereby a hospital is able to compensate the extra costs by patients of other specializations. Next, a benchmark could be done to compare the case mix of hospitals whereby a higher amount of specializations are used. This will increase the representativeness of the benchmark.

For further research, also other aspects of the benchmark could be used to prove that some hospitals treat more complex patients within a particular DBC than other hospitals. For example, the researcher could examine whether patients who are treated in an surgical way are more complex than patients who are treated medically. In other words, there may be a relation between complex patients and patients who undergo an surgical method.

8.3 Policy implications

The pressure on reforms of the health care system is increasing. The Department of Health has introduced different systems in the past to keep the Dutch health care affordable. The next method of the Department of Health is that they recently have increased the B-segment from 10% to 20% and they will implement yardstick competition for circa 50% of the budget from a hospital. The Department of Health has decided to implement yardstick competition for the transition period of three years. In particular, a point of discussion towards the NZa and the Department of Health is, that they want to implement a new reimbursement system, which is based on a next application of the DBC-system while the recent DBC-system is not working perfectly. As shown in the results, between the revenues and the costs of regularly referred patients within the Eye Hospital differences are signalized. The Department of Health and the NZa should not neglect this high distinction between the revenues which are composed by the NZa and the costs of both regularly and tertiary referred patients within the Eye Hospital.

In relation to this point of critic, also the method of the 'CGAO-route' may be discussed. As explained in section 6.2.1, the revenues of the NZa are based on the cost prices of treatments of thirteen general hospitals only. So a point of discussion is, this sample is too small and that not one specialized or top-clinical hospital is taken into account when the data of costs of treatments were put together to calculate the gross revenues.

Next, a point of discussion is related to the way hospitals are motivated by this new reimbursement system. Before the benchmark of the study was done, two assumptions were made in chapter 5 about findings of yardstick competition, which may have impact on the

financial position of the Eye Hospital. The first assumption is that yardstick competition does take the weights of relative difficult treatments into account by the calculation of the yardstick due to a product mix index, described as the difference *between* DBCs. The second assumption underlines, that with the plans of the implementation of yardstick competition, the Department of Health does not take the differences *within* a DBC into account.

A point of discussion towards the Department of Health and the NZa relates to the assumption that they omit to take differences within a DBC into account. Since a goal of yardstick competition is to provide the opportunity for hospitals to specialize, the Department of Health and the NZa actually hinder this by not providing any compensation for hospitals who treat the more servere ill patients. From this perspective, yardstick competition gives incentives to treat the 'standard' patients, so a counter reaction will be stimulated.

Also, a specialized or top-clinical hospital will sooner be labeled as ´inefficient´ by the NZa, because it will be harder for these hospitals to stay under the yardstick with their DBC-prices. Several examples in the study are given why specialized and top-clinical hospitals differ from general hospitals. As discussed in section 8.1, a specialized hospital may receive tertiary referred patients more often than general hospitals, which results in extra costs. In addition, the patient stream that had the highest amount of tertiary referred patients was even found to be the most expensive; the difference between regular and tertiary referred retina patients provided a total lost for the Eye Hospital of over 300.000 euro in 2006. So, neglecting the difference within DBCs results in high extra cost for specialized hospitals. Furthermore, specialized and top-clinical hospitals have a different case mix in comparison with general hospitals (see pie-division 1 and 2). Also, the status of the hospitals differ; since specialized and top-clinical hospital provide different services and treatments compared with general hospital, general practitioners probably take this into account by their decision to which hospital they refer their patients.

To conclude, the Department of Health and the NZa wants to introduce a new reimbursement system, while in the recent DBC-system large discrepancies are signalized between the revenues versus the costs for a treatment. Also, they neglect an important aspect with the implementation of yardstick competition. Since the yardstick does not take differences within a DBC into account, hospitals will not receive a compensation for the relative complex patients. This results in negative consequences for, especially, the financial position of specialized and top-clinical hospitals.

Chapter 9 Recommendations

Based on the outcomes of the study, the following recommendations for the Eye Hospital are presented.

On the one hand I recommend the Eye Hospital to specialize in retina patients, diabetic retina as well as 'regular' retina. The amount of patients who are medically treated for diabetic retina and surgically treated for retina is found to be much higher compared to the approximated hospitals. This means the Eye Hospital domains a large position in the market. This is especially interesting since the competition in health care is increasing. And because the retina patients also form 14% of the patient population within the Eye Hospital itself, the price negotiation with health insurance companies is of major importance.

On the other hand, before the Eye Hospital focuses on the retina patients, the hospital must be sure that it is compensated for this relatively expensive patient stream. To ensure this, the DBC weights from the NZa for the product mix index are important. If the DBC of a retina patient is related to a high DBC weight, this results in a higher product mix index for the Eye Hospital. Next, a higher product mix index ensures that a higher individual yardstick for the Eye Hospitals is stated.

But as long as the formula of the yardstick does not change, the Eye Hospital will not be compensated for the relative complex retina-patients. As illustrated in the study, the relatively complex retina-patients, like the tertiary referred patients, are very expensive. So, the recommendation to the Eye Hospital is to narrowly follow the movements of the development of yardstick competition whether to decide to specialize on the retina-patients.

Next, for some diagnoses the Eye Hospital is found to have much higher costs for a DBC compared with the revenues that the NZa has advised to reimburse the hospitals. The question should be considered whether this is related to the primary health care process or to the case mix profile of its patient population. If the high costs for patients stream within the Eye Hospital can be related to the primary process, the efficiency of the hospital should be examined. But if the high costs are due to the case mix, it is caused by their position of being a specialized hospital. Hereby the Eye Hospital should make more effort to try to convince the field that it needs to receive compensation.

As continuation of the study, the Eye Hospital should make clear to both the Department of Health and the NZa that they undermine the goal of yardstick competition to stimulate specialization. Not only the Eye Hospital should show the extra costs tertiary referred patients bring to a specialized hospital, I also recommend the Eye Hospital to do a follow up study to prove by other factors in which a specialized hospital has a more complex case mix than a general hospital. For example, the Eye Hospital can do a benchmark in the amount of second opinions they receive and evaluate the extra costs this may bring. Next, it is possible to examine whether the Eye Hospital receives more elderly patients and whether the patients who came from a region outside their own region are more complex. Also, a recommendation is to examine whether there is a relation between complex patients and surgical treatments. Since a relatively high amount of patients have had an surgical treatment within the Eye Hospital, this could be a next indicator to highlight that they have an expensive case mix.

Finally, I advice the Eye Hospital to do a follow up study whereby other specializations are also included. Since a drawback may be for the Eye Hospital that they are able to compensate their relative expensive DBC-prices within yardstick competition within only one specialization, the hospital should examine in which context this may result in different outcomes for the Eye Hospital versus general hospitals.

To summarize the study, with the plans of introducing yardstick competition the Department of Health and the NZa underestimate that more complex patients are often more expensive. When no compensation is provided for a hospital to treat the more severe ill patients from a patient streams, hospitals remain incentives to treat only the 'standard' patients. The question must be asked, whether complex patients will stay able to receive their treatments. Hereby, the Department of Health and the NZa must realize that a specialized hospital, like the Eye Hospital, is necessary to allow also the more severe ill patients their rights, which is that entrance for health care must stay possible for everyone.

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List of shortenings

CBZ   College of Building Social Services - College Bouw Zorgvoorzieningen

CGAO   Central Registration and Analysis of Environment - Centrale Gegevens en Analyse Omgeving

CPB   Netherlands Bureau for Economic Policy Analysis - Centraal Planbureau

DBC   Diagnosis Treatment Combination - Diagnose- behandelingscombinatie

DRG   Diagnosis Related Groups system

FCC   Federal Communications Commission

LEC   Local exchange carriers

NKC   Normative Capital Costs - Normatieve Kapitaals Component

NHC   Normative accommodation component - Normatieve Huisvestings Component

NVZ   Interest group for Hospitals - Nederlandse Vereniging van Ziekenhuizen

NZa   Dutch Health Care Authority - Nederlandse Zorgautoriteit

OFWAT   Office of Water Services

SDO   Corporation maintenance of DBC - Stichting DBC- Onderhoud

VWS   Department of Health, Welfare and Sport - Ministerie van Volksgezondheid, Welzijn en Sport

WBMV   Law of special medical treatments - Wet bijzondere medische verrichtingen

ZN   Interest group for Health Insurance Companies - Zorgverzekeraars Nederland