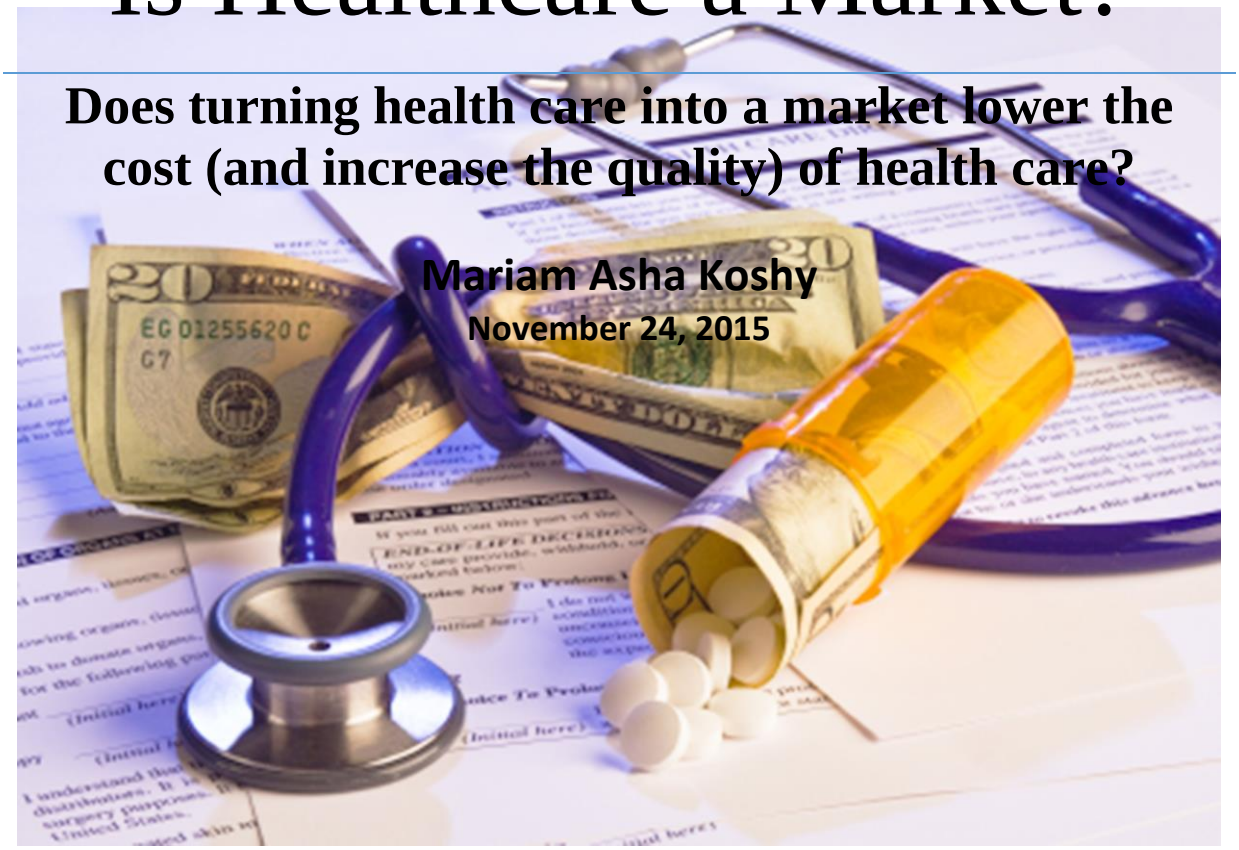
DELFT UNIVERSITY OF TECHNOLOGY

# Is Healthcare a Market?

## Does turning health care into a market lower the cost (and increase the quality) of health care?



**Mariam Asha Koshy**

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**Master Thesis**

**FACULTY TECHNOLOGY, POLICY AND MANAGEMENT**

# Is Healthcare a Market?

**Does turning health care into a market lower the cost (and increase the quality) of health care?**


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Mariam Asha Koshy

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## Executive Summary

Rising cost of health care is a major crisis faced by different countries around the world especially the U.S. In an attempt to reduce the rising costs of health care, many governments are considering embarking on a path of turning health care into a 'market' which is expected to lower costs while improving the quality of health care. Considering the rising cost of health care in the U.S. there are basically two arguments – a. The rising cost is due to too much market. b. the rising cost is due to too little market or in other words due to government regulations. The aim of this thesis is to understand *whether* and *how* turning health care into a market would help bring down cost and raise quality.

As a first step in answering this question first the concept of 'market' is defined. For this purpose a neoclassical model of health care 'market' is developed as a theoretical framework and explained how it is applied to health care and how this is expected to reduce cost. Neoclassical economics is an economic theory or model originally developed for the analysis and design of trade in goods, that is, for the production, exchange and consumption of goods. A first question that arises is whether neoclassical assumptions are compatible with the nature of health care. For example, is profit maximisation by producers reconcilable with the Hippocratic Oath taken by doctors, and is utility (or consumption) maximisation by consumers reconcilable with 'satisficing behaviour' by patients? To further investigate whether market can bring down cost, the main components leading to high cost in health care have been identified as pharmaceutical industry, medical technology industry, physicians, and hospitals and cost developments in each area are analysed. Although the focus of this thesis is on the U.S. health care system, the Canadian and Dutch health care systems are also briefly studied for comparison. As a next step the claims made by critics of a market-based health care system – that the rising costs of health care in the U.S. are due to the opening up of health care to the (neoclassical) market is investigated. Regarding the cost of medicine and medical technology, three 'neoclassical market' factors contributing to rising costs are identified: the patent system, 'direct-to-consumer advertising', and lobbying (although whether the third is acceptable from a neoclassical point of view is debatable). Regarding the health care provided by doctors and physicians, three 'neoclassical market' factors have contributed to rising costs: the introduction of competition between health care providers which has resulted in a 'technology arms race' and an increase in expensive high-tech based treatments; 'direct-to-consumer advertising' which has increased the demand for medicines and treatments; excessive treatments resulting from lack of divisibility and substitutability; the establishment of Preferred Provider Organizations (PPOs) directed at bringing about competition between physicians but leading, in practice, to monopsonistic rents on the part of insurance companies rather than to lower costs of the care provided. Regarding the quality of health care, two major factors of concern are (1) the exclusion from medicine and treatment of individuals who do not have the ability to pay (in neoclassical term, meritocracy) and (2) the introduction of (Taylorist) 'scientific management' which has led to standardisation and protocolisation of treatment (in neoclassical terms,

a homogenisation of the product of health care) and an increase in (expensive) robotic surgery; the quality effects of both are still debated. As a next step the claim made by proponents of a 'free market'-based health care system – that the U.S. health care system is not (yet) a free market and that the rising costs of health care are the result of government intervention and over-regulation is investigated. Five factors contributing to rising costs are identified: (1) a restriction on free entry of new doctors due to licensing of doctors; (2) an insurance system that (a) supports medicine use and medical treatments by introducing a 'soft budget constraint' and, moreover, (b) places a heavy burden on physicians and hospitals in terms of time- and cost-intensive administration and negotiation; (3) the costs of research procedures for testing the safety of drugs (ensured by the Food and Drugs Administration); (4) 'managed care' by Health Maintenance Organisations leading to monopsonistic rents with insurance companies; and (5) standardisation or protocollisation leading to over-use of technology in health care. Regarding the first factor i.e. High cost is due to restriction on free entry of new doctors due to licensing of doctors, my thesis has found out that in reality, however, in the U.S., the number of doctors (per 1000 inhabitants) is found to be larger than in other countries (where costs of health care are lower), and other factors appear to be more important in determining costs, such as the high price of patented medicine (in comparison to generic medicine) and the increased over use of the newest technologies. These cost factors, however, are unlikely to disappear with the introduction of a neoclassical market; rather, they appear to be a result of the introduction of the neoclassical market.

Significantly, however, although the rising costs of health care are related in part to the introduction of the neoclassical market model in health care, it should be noted that the system as implemented in practice in the U.S. (and elsewhere) is in many ways quite far removed from the pure neoclassical model. Neoclassical elements such as competition, homogenisation of products, and the commercial development and patenting of knowledge have been introduced within a larger system of 'managed care' regulated by a mix of public and private parties including government and insurance companies and behind these, (medical) industry.

For example, competition between doctors and hospitals does not take place in a 'free market' context, but within an organisational framework managed by Health Maintenance Organisations run by insurance companies supported by regulation and legal adjustments. Therefore, it is not possible to draw simple conclusions such as that the rising costs of health care are due to either the introduction of a neoclassical market or government regulation. What has emerged in practice is a particular market-state mix which in the literature has been named 'neo-liberalism'.

**Policy Implications & Recommendations**

Though my analysis about the way in which the pharmaceutical and medical technology industry as well as the health care provided by physicians and hospitals are organised in the U.S., I arrive at several questions which needs deep analysis and consideration by the policy makers while designing a health care system. The questions can be summarised as follows: If the aim of health care is to provide people in need of health care with the required medicine, medical technology and physician care, and if the commercial development of knowledge leads to (a) prices that are too high for many to afford, (b) a neglect of diseases experienced by people who do not have the ability to pay, what would be a better way or organising the development of knowledge? Should knowledge development remain within the boundary of economy or should it be considered as a separate sphere by itself? Most important question is whether in reality patent system which is allowing monopoly for the industries actually leading to knowledge development as claimed by neoclassical economics (in theory) since evidence suggest that most of the research and investments in developing knowledge is done by the government and the companies are just claiming the right to it (right which they acquired through lobbying). It is very important to note that, when 'market' is proposed as a solution, a careful analysis of what is claimed in theory (theoretical explanation of market) and what is happening in reality (when market is implemented) need to be done before any policy decision is taken.

My thesis while investigating the reasons for the rising cost in health care, whether it is due to market or due to government regulations, came to the conclusion that what has emerged in practice is a particular market-state mix which in the literature has been named 'neo-liberalism'. I feel that the impact of this new market-state relationship on justice (e.g. the impact of legal changes on access to health care) and freedom (e.g. freedom of choice in medicine and treatment) is an under-researched area and it is here that further research appears to be most urgently needed and considered by the policy analysts.

Analysis of the health care services has led me to three questions I would like to raise, which needs careful analysis by the policy analysts. When it comes to health care services, it has been found out that it poses certain features that makes it a lesser candidate to fit into a neoclassical market which as already mentioned has been developed for the buying and selling of material goods. This leads to the question whether health care should be treated like any other good? Can health care service (interaction between doctors and patients) which is not uniform or homogeneous in nature be standardized without the loss of quality of it? Is it right to consider health care as a good and try to fit it into the neoclassical model? As we can see, health care is a growing domain (e.g. as a share of GDP) involving increasingly large sums of money. My thesis raises a very important question that need to be analysed by the policy makers. For what purpose are these resources being used? Apart from health, do other motives also play a role in the allocation of health care resources? For example

are rules and regulations regarding health care (including medical industry and health care services) are implemented in such a way that they are used as instruments of industrial policy[1]?

Since we do know only about just two options as solutions – either open up to market or government controlled system, it is time we think about a third alternative method which would ensure health care to all irrespective of their capacity to pay for it. As a first step I started with U.S. philosopher Michael Walzer who said that health care is a right of every human being and it should have its own sphere and autonomy unlike other regular goods that can be sold in a market. Although Walzer has a valuable point, I like to differ with him with respect to his treatment of the economy. When Walzer accepts the 'justice of the market' as a separate sphere of justice, it appears by 'market' he means 'neoclassical market', a market organised according to neoclassical principles such as competition and profit-maximisation. However, if competition, profit maximisation and utility maximisation ('unlimited wants') are accepted as the basis of the economic order, how can 'economic imperialism'[2] – the domination of all spheres by demands coming from the economy – be avoided? How to protect the values belonging to each sphere if one sphere is allowed to expand without limits?

Answering this question, in my view, requires rethinking the relationships between three spheres: health care (including the development of knowledge concerning health and health care), government (law-giving and regulation), and economy. What relationships between these three would protect the values belonging to health care, including access to health care for all, and freedom of choice regarding the kind of health care received? These questions require careful attention and analysis.

[1] See, for instance, the *European Competitiveness Report* 2014: "Helping Firms Grow".
[2] Lazear, Edward, P. (2000) Economic Imperialism, *The Quarterly Journal of Economics* **115** (1) 99−146.

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# 1. Introduction

## 1.1 Increasing cost of health care

It is a conventional wisdom that the cost of healthcare is becoming "too large for the economy to bear". Automation and robotisation of a wide range of care tasks, including those of doctors, and opening up health care to the 'discipline of the market' are proposed as solutions. Following neoclassical economic logic, the efficiency of health care can be enhanced by creating a market for health care. The purpose of this thesis is to investigate this logic by examining two contrasting positions. The first (e.g. Williams 2008) uses the example of the U.S. to argue that opening up health care to the market increases the cost of health care. The second is the view that the high cost of U.S. health is not due to 'too much market', but due to 'too little market'. Kraemer (2006) for instance, claims that the American health care system has too little market and this is the reason for the burgeoning cost. The purpose of this research is to distinguish myth and reality in this discussion and propose alternative solutions.

Rising health care expenditures have led to concerns that health care costs are becoming "too high for the economy to bear" (e.g. Bain & Company). Solutions which are commonly proposed include (a) the opening up of health care to the market, (b) increased use of technology including automation and robotisation, and (c) standardization, all of which are expected to reduce costs. The U.S. is often cited as an example where these three elements have long been introduced. Historical studies show how the U.S. health care system has gradually developed into a market. Moreover, internationally, U.S. health care currently has the highest rate of technology use (D Callahan, 2009). At the same time, however, the U.S. rank highest in terms of the costs of health care: with a health care expenditure of 17% of GDP, the U.S. health care system ranks at the top in terms of costs compared to other industrialized countries (Squires 2012). This thesis explores the reasons behind and possible solutions to the rising costs of U.S. health care.

In terms of explanations, there are basically two positions. Firstly, according to, Williams (2008) and Mahar (2006), the high costs of the U.S. health care system are due to the adoption of a market system in health care. Williams (2008), for instance, blames the market system, as well as neoclassical theory as the reason behind the rising costs.

Secondly, a contrasting view put forward by Kraemer (2006) is that the costs of the U.S. health care system are high because the U.S. system is not a free market system. On the

contrary, the U.S. system is a ‘closed system’ and regulation and flaws in federal policies are the real reasons for the burgeoning costs.

Thus, the issue of rising health care costs are as yet undecided. This thesis aims at exploring the issue further. Why is the US health care system so expensive? Is it because it has opened up to the market too much or too little? And what are possible solutions?

In section 1.2, the theoritical background is presented. Section 1.3 & section 1.4 gives the societal and scientific relevance. Section 1.5 gives the research Objective. Section 1.6 gives research questions. Methodology and subquestions are given in section 5. Section 1.7 indicates the research method.

### 1.2 Theoretical Background

Between 1995 and 2010, world healthcare expenditure increased from 8.8 to 10.2 per cent of GDP (OECD.Stat, 2015). In the U.S. alone, healthcare expenditure increased from 13.2% of GDP in 1995 to 17.1% of GDP in 2010 (OECD.Stat, 2015). In the U.S. as well as elsewhere, governments are looking for avenues to decrease healthcare cost (OECD.Stat, 2015). Three avenues are commonly proposed.

First, a solution suggested by economists to bring down costs is to introduce competition to induce health care to operate more like a market (P. Feldstein, 2012). It is suggested that health care has evolved so much over the decades that it can operate like an industry. Proper reforms in this direction are said to significantly reduce the cost of health care and improve its quality. It is also suggested that a competitive and international market for health insurance could greatly expand consumer choice and reduce costs (Dayaratna 2013). According to Dash (2010) competition can create potent incentives that encourage providers to innovate so that they deliver high-quality service at lower cost. In a market economy, competition leads to innovation that enables rapid diffusion of new technologies. As a result only the strong and excellent competitors prosper and grow while weaker rivals exit the business. This will promote efficiency and help to improve the overall quality. As improved competition among corporations have enabled them to increase productivity, it is suggested that the same can be applied to health care also.

The second suggestion put forward to reduce cost is an increased use of technology that enables robotisation and automation of healthcare provision. This avenue is related to the first one because, according to standard economic theory, increased competition will bring about optimal use of the most productive technologies. Manufacturing industries, which began to

bring down their costs in the 1970's, are held out as the example. According to Minifie (1989), the largest contributor of costs to the manufacturing industry was labour, and solutions applied in the manufacturing industry are also applicable to health care. One solution implemented by the manufacturing industry was the introduction of robots to replace labour. As per the author approximately 39-60% of healthcare costs are related to labour. The author emphasizes that the advantage of freeing labour from routine tasks would give them opportunity to engage themselves in more creative and decision-making processes. He argues that, with technological advancement, the price of robots would decrease and this would get reflected in lower costs of health care.

Data show that the use of technology in health care is rising. According to Bain & Company (2012), medical technology is forecasted to grow by 3 % yearly. A recent development in health care is the advent of robotic surgery especially in the US and Europe in the last 4 years. As per De Wilde & Hermann (2013), a major breakthrough in the field of robotic surgery took place due to the rapid advancement in electronics and computer technology in the 20$^{th}$ century. The number of robot-assisted procedures has nearly tripled since 2007 from 80000 to 205000. The leading robotic technology that was installed in hospitals grew by approximately 75%. Studies show that most of these procedures were earlier performed laproscopically (Cutler 2013).

The third suggestion put forward to reduce cost is increased standardisation and ''protocollisation'' of health care. It is believed that standardisation would reduce healthcare costs by the increased use of guidelines, for instance, by incorporating (mandatory) checklists into the software physicians are using (Bain & Company 2012). The second and third avenues are related because standardisation of diagnosis and treatment procedures are made possible by technology (in particular ICT).

However, treating health care as a sector of the economy operating in a market has been a subject of debate over the years. According to Williams (2008), although the US has always followed a market-based system, the cost of the U.S. healthcare system is quite high compared to other developed countries (see Mahar 2006). Health care is one of the most troubled sectors in the U.S., with cost over-runs and quality problems (Hill & Powell, 2009). The question is, Why? The issue at stake is whether the cost of health care can be reduced by opening it up to 'the discipline of the market', or is following the free-market model of economics the reason why the cost of U.S. health care remains very high even after the extensive use of automation and robotics, asks Williams (2008).

A comparative study of health care expenditures in the United States and Canada by Fuchs & Hahn (1990) shows that, even though both are developed countries, the expenditure for health care in the U.S. is almost 11.5 percent of the Gross National Product whereas in Canada it is only 9 percent. The cost for surgical procedures in the United States is 2.78 times that of Canada, even though both countries are developed and equally advanced in technology. In the use of technology and robotics, the United States is one of the leading countries in the world (L. J. Kricka, D. Parsons, & R. B. Coolen, 1997). If automation and robotics are the solution to bring down cost and improve quality, then the question arises why a technologically advanced country like the United States has relatively high healthcare expenditure. Are the market and increased use of technology the solution to the rising cost of health care?

On the other hand, while Williams (2008) claims that the U.S. health care system is an open market-based system, there is a contrasting view put forward by Kraemer (2006). According to Sylvia Kramer the U.S. health care system is not a free market system, and she blames federal policies for the high cost of the US medical system. She argues that the monopolistic tendencies of scientific and medical authority and their associated intitutional interests are the reason for the burgeoning costs of the US health care system. (Kraemer, 2006)

These contrasting views bring us to more specific research questions. Is the American health care system a free market? What are the real reasons behind the burgeoning cost of the U.S. health care system? Is it because it is too closed or is it because it is too much open to marketization? If it is too closed, will further opening up to the market, as neoclassical theory predicts, bring down the cost of U.S. health care?

### 1.3 Societal relevance

The debate about the effects of “too much market” or “too little market” is very interesting for countries that are considering following the U.S. example of opening up health care to the market as a way to reduce costs, such as the Netherlands. In 2006, the single compulsory health insurance scheme was introduced in Netherlands. This is considered to be the time when the market mechanism was introduced into the Dutch health care system. Before the reforms were introduced, the government was directly controlling the health care system. The reforms shifted responsibility for health care to the private sector, especially to the insurance sector, reducing the role of the government to that of ‘care taker’ (Schäfer *et al*, 2010). According to Dutch Health Care Performance Report 2014, health care expenditure between

2000 & 2013 increased by 5.5% per annum. In 2005 health care expenditure was 10.9% of GDP which increased to 11.9% of GDP in 2009 and further to 12.5% of GDP in 2012. Even though Dutch health care expenditure was low compared to the U.S. (at 17.9% of GDP in 2012; see The World Bank Report 2014) the Netherlands has the highest health care expenditure when compared to other European countries. This makes the Netherlands an interesting case to study in comparison with the U.S. and Canada. How will further marketization influence the costs of health care in the Netherlands?

### 1.4 Scientific relevance

Neoclassical health care economics predicts that the opening up of health care to the market will reduce costs while increasing the quality of health care. To what extent this theoretical idea holds true in practice is little understood. There are contrasting views in this regard. Some claim that the burgeoning cost of health care in particular in the U.S. is due to the fact that American health care system is a market system; others argue that the high cost is due to the fact that it is a closed (regulated) system. In this study the U.S. health care system will be compared to the neoclassical model in order to assess to what extent it resembles a neoclassical market. If the U.S. health care system resembles the neoclassical health care market, this may raise doubt on the neoclassical idea that opening up to the market will reduce costs in health care. If it does not have (all) the features of a neoclassical market, the high costs of U.S. health care cannot be held as a case to falsify the claim that the opening of health care to the market reduces costs.

### 1.5 Research Objective

The proposed research consists of the following steps.

**Step 1:** The logic of the standard neoclassical argument for market introduction will be examined. In particular, through which mechanisms is the opening up of health care to the market expected to reduce costs while increasing the quality of health care? The neoclassical health market model will be examined and described. This model will be used for comparison with the American health care system (in step 6) in order to assess to what extent it resembles a neoclassical market.

**Step 2:** The development of health care costs in the (market-based) U.S. will be investigated and compared with costs in Canada and the Netherlands. Different costs component will be distinguished and their evolution over time will be traced.

**Step 3:** Proposition 1 will be examined: "The rising costs of health care are due to the opening up of health care to the market." The evolution of the U.S. health care system from a non-market system to a market-based system will be described, and the literature according to which the rising costs of health care in the U.S. are due to its opening up to the market will be reviewed. Different 'cost-push' factors such as pressure from industry and financial markets will be examined.

**Step 4:** Proposition 2 will be examined: "The rising costs of health care are due to state intervention / regulation; the solution is a stronger opening up to the market." The role of the government and insurance companies, including increased standardisation and protocolisation, will be investigated.

**Step 5:** The health care systems of Canada and the Netherlands will be examined for market and non-market elements. Two interviews will be undertaken in order to better understand the relationship between the rising capital intensity on the practice of doctors in Netherlands. Most of the literature presents quite general statements about these relationships. Moreover, the English literature on the Dutch healthcare system is limited. Finally, since the market has been introduced in the Netherlands only relatively recently, data for the Netherlands are more difficult to come by. For these three reasons, the literature study will be complemented by two case studies of health care practitioners in the Netherlands.

The aim of the interviews is twofold:

The first aim is to understand the relationship between the rising capital intensity on the practice of doctors. For this purpose, a larger survey among health care practitioners would be ideal. However, given time limits, this will not be possible in the context of this thesis. Therefore the second aim of the interviews is to come up with a questionnaire that could be set out among health care practitioners to study the effect on health care costs of the introduction of marketization in Dutch health care.

**Step 6:** The arguments underlying the two propositions will be examined for theoretical and empirical robustness. We assess to what extent the U.S. system is market-based using the pure neoclassical health care model as a criterion or 'benchmark'. Assessment of the extent to which the U.S. health care systems are market-based will allow us to draw at least some tentative conclusions regarding the relationship between the degree of marketization and the evolution of costs.

**Step 7:** If opening up health care to the market negatively affects costs and quality, existing proposals for alternative solutions to the rising costs of health care will be discussed.

### 1.6 Research Questions

Does turning health care into a market lower the cost (and increase the quality) of health care?

**Sub questions:**

1. *How is the opening of health care to the market expected to lower the costs (and increase the quality) of health care?*

   The logic of (neoclassical) health care economics will be examined.

2. *The evolution of the costs and quality of health care.*

   What are the main components of health care costs in the U.S., Canada, and the Netherlands*?* How have they evolved over time? How has the quality of health care evolved over time?

3. *What are causes of the rising costs?*

   Are they related to 'too much market' (e.g. pressure from industry and/or financial markets)?

4. *Or are the rising costs related to 'too little market'?*

   What is the impact on health care costs of (government or non-government) intervention / regulation)?

   *How is the Canadian and the Dutch Health care system designed? What is the role of technology in the rising costs of health care? What are factors behind the rising use of technology?*

5. *How is the Canadian and the Dutch Health care system designed? What is the role of technology in the rising costs of health care in Netherlands? What are factors behind the rising use of technology?*

   In order to understand the role of technology in the costs of health care and possible relationships with an opening up to the market, two interviews will be undertaken in the Netherlands. A questionnaire would also be developed which could be set out among health care practitioners in the Netherlands to understand the role of the market and technology in the evolution of the costs of health care.

6. *Is it possible to come to a conclusion regarding the relationship between the market and the rising costs of health care?* What are market and non-market elements in the

health care systems of the U.S.? Does more exposure to the market increase or reduce the costs of health care?

7. *If the opening up health care to the market negatively affects the costs and/or quality of health care, what are possible alternatives?* Existing proposals for an alternative system will be examined, with special attention for the question how health care is to be financed (if not through the market).

### 1.7 Research Method

**Table 1 - Research Method**

| SI NO | Sub Questions | Research Method | Reason / Objective |
|---|---|---|---|
| 1 | *How is the opening of health care to the market expected to lower the costs (and increase the quality) of health care?* | Literature review - Analysis of the neoclassical argument on the opening up of health care to the market. | Understand the mechanisms through which the (neoclassical) market is expected to reduce cost in health care. Clearly describe the neoclassical model so that it can subsequently be used as a criterion to assess to what extent the U.S. health care system is market-based. |
| 2 | *The evolution of the costs and quality of health care. What are the main components of health care costs in the U.S., Canada, and the Netherlands? How have they evolved over time? How has the quality of health care evolved over time?* | Literature review Interviews & secondary data | Comparative study of the 3 health care systems would be done to carefully evaluate the main components of cost in all the three countries. |
| 3 | *What is the role of the market in the rising costs of health care?* | *Literature review.* | Examine 'cost-push' factors originating in the market. |

| | | | |
|---|---|---|---|
| 4 | *What is the role of the government intervention / regulation in the rising costs of health care?* | *Literature review.* | Examine 'cost-push' factors originating in the public sector and / or regulation. |
| 5 | *How is the Canadian and the Dutch Health care system designed? What is the role of technology in the rising costs of health care? How does technology affect the quality of health care? What are factors behind the rising use of technology?* | Exploratory Case Study based on interview and primary data collection. | Collect primary data on the relationship between increasing capital intensity and practice of doctors.<br>Develop a questionnaire for a possible future survey. |
| 7 | *If opening up health care to the market negatively affects the costs and/or quality of health care, what are possible alternatives?* | Literature review, | Identification and description of proposals for alternative solutions in health care. Suggestions for further research. |

# 2. The neoclassical solution to high health care costs

## Introduction

In this chapter I will discuss the neoclassical solution to the rising costs of health care. According to neoclassical economics, the solution is to open up health care to the market; subjection to competition will force suppliers of health care to bring costs and prices down.

In Section 2.1 I review the relevant standard assumptions of the neoclassical perfect competition model. In Sections 2.2 and 2.3 I discuss possibilities for and possible problems in applying the neoclassical model to health care. The main question for this chapter will be to assess to what extent the neoclassical market model is applicable to health care *in theory*. Whether it is applicable in reality is the subject of chapters 4 and 5. Section 2.4 concludes this theoretical chapter.

## 2.1 Standard neoclassical assumptions

The neoclassical model of perfect competition is based on many assumptions. Some of the most important are:

1. **Rationality:** All the individuals behave rationally. They trade goods and services that they value more for those they value less (Himmelweit, Simonetti, & Trigg, 2001). Each individual wants to maximise personal gain (Koutsoyiannis, 1992). Consumers buy goods using their income and they know how to allocate it in such a way that their satisfaction/utility is maximized **(utility maximisation)** (Koutsoyiannis, 1992)**.** Producers allocate their resources in such a way that they produce the level of goods that would maximize their profit **(profit maximisation)** (Koutsoyiannis, 1992)**.** Thus, the assumption of rationality in turn requires other, more fundamental assumptions, such as the assumptions of utilitarian preferences and of perfect knowledge (Himmelweit et al., 2001).
2. **Perfect knowledge:** Markets are transparent and information is costless. Therefore, all the individuals make decisions with perfect knowledge (Himmelweit et al., 2001). Buyers and sellers precisely know the quality of the goods in the market, their prices, quantity and features (Himmelweit et al., 2001). There is no place for uncertainty. Thanks to perfect knowledge, consumers can be rational, that is, they can compare prices and quality and decide what they want; thus, they maximize their utility (Himmelweit et al., 2001). Similarly for profit-maximising producers. Whether perfect knowledge exist in reality in health care is explained in section 4.1.3, 4.2.3, 5.2.

3. **Many participants / no barriers to entry and exit:** To have a perfect competition there should be many small players in the market. This means that an individual player cannot influence the market in terms of price. They are just price takers (Himmelweit et al., 2001). For example, if the market has to be perfectly competitive, producers should be able to enter and exit the market whenever they like to do it. When seller 1 is seen to be making profit in a particular industry, other sellers would get interested and they would also enter the market and start the same business to get a part of this (profit) pie (Himmelweit et al., 2001). Many buyers are needed to avoid market power on the part of buyers (monopsony) which would result in too low consumer prices (prices that are suboptimal because they are too low from the perspective of producers). However, there may be reasons in reality why one or more assumptions of the perfect competition model do not hold. An example is indivisibility of fixed costs, i.e. a violation of the assumption of divisibility, which will lead to economies of scale. In such a case, a deviation of perfect competition model, such as oligopoly or even monopoly, is accepted as an inevitable 'second best' solution in neoclassical economics. (Refer section 4.1.1 & 4.1.2 & 4.2.1).

4. **Substitutability and divisibility**: According to neoclassical economics, production factors (land, labour and capital) are fully substitutable and divisible (Himmelweit et al., 2001). This is not always true in reality. Even though theoretically technical change is a continuous change as shown in figure 2, in reality it is not so. Buying a technology is a discrete choice. If you have the financial capacity you will buy or else you will restrain yourself from buying. Once the capital (device) is bought you are forced to use it to make up for the spent capital. In reality you cannot divide the device into smaller components and use it. Substituting the device with some other alternatives (even if it is available) is also not possible since you have spent a substantial amount to buy the device. How this works in health care is explained in chapter 5 sections 5.1.5, 5.1.7, 5.1.10 and in chapter 6 sections 6.1.4.

5. **Homogeneous products (Standardized Products):** All the goods produced in a particular market are assumed to be identical in all respects such as features, quality and benefits. In other words standardization of the product is an essential feature of the neo classical model for perfect competition takers (Himmelweit et al., 2001). There is no product differentiation in a perfect competitive market (refer section 5.3).

6. **Individual preferences:** Neoclassical economics assumes preferences to be utilitarian. Neoclassical utilitarianism defines right actions as those that fulfil the (consumption and

profit) interests of individuals, on the assumption that this simultaneously enhances overall welfare. One of the characteristics of utilitarian preferences is that it excludes the possibility of satisfaction; producers and consumers always want more and are never satisfied (Koutsoyiannis, 1992), (Chung, 1994), (Nicholson & Snyder, 2007), (Varian, 1992), (Wolff & Stephen, 2012) . (Refer sections 5.2, 4.1.3 & 6.1.3 to get a view on how it works in health care).

7. **No externalities:** Externalities occur when a third party who is not directly related to the transaction is either positively or negatively affected by the production or consumption of a good (Himmelweit et al., 2001). When prices do not adequately reflect the full (internal and external) cost, consumers and producers will take wrong (i.e. non welfare-optimising) decisions. For example, goods with negative external effects will be too cheap; hence they will be over-produced and over-consumed. Neoclassical solutions to externalities include (a) internalisation of the externality through pricing of the externality, and (b) government intervention through, for example, taxation or regulation takers (Himmelweit et al., 2001). Knowledge production as well as its dissemination also involve externalities which would be explained in section 2.1.9 on intellectual property (Siddiqi, 2005), (Vallee & Yildizoglu, 2004).
8. **Maximisation of shareholder value**

   Another assumption required by the neoclassical model regards legal matters, in particular property rights. Profit maximisation requires two things: a utilitarian perspective on the human being, and private property of the means of production, in particular capital (Sumantra, 2005), (William, 2011). The idea is that profit-maximising owners of capital will want to accumulate capital; and private accumulation of capital − in terms of the modern literature: 'maximisation of shareholder value' (MSV) − will benefit everyone since expansion of the capital stock is the basis of economic growth and hence of the growth of consumption (Sumantra, 2005), (William, 2011). How MSV works in health care is explained in chapter 4 (refer section 4.1.2, 4.1.6, 4.2.1 & 4.2.3, 5.1.9).

9. **Intellectual property**

   More recently, the idea that private property is necessary to attain maximum social welfare (i.e. consumption) has been extended to other fields, in particular the field of research, i.e. the generation of knowledge. According to neoclassical economics, there should be agent incentive for the development of knowledge (Siddiqi, 2005), (Vallee &

Yildizoglu, 2004). If a person is developing a knowledge through his research and development initiatives and if other people who are not even involved in the process of its development are getting free access to the knowledge then it would lead to externality (a third party who is not directly related to the transaction is positively affected by the production or consumption of knowledge). To prevent this neoclassical economics allows private ownership of knowledge through patenting which gives the agent sole ownership of it (Siddiqi, 2005), (Vallee & Yildizoglu, 2004). Whether intellectual property enhances social welfare is explained in sections (4.1.2, 4.1.6, 4.1.7, 4.2.1 & 4.2.3).

**10. Meritocracy**

An individual's ability to afford goods depends on his/her contribution to the overall product, more specifically, his/her marginal productivity. An individual's income represents his marginal productivity and thus his eligibility to buy or own a particular good. Refer section 2.3.10 to see whether it can be applied to health care.

If health care is to become a market, the first requirement is that the neoclassical assumptions must hold. In the next section I discuss the relevance of the assumptions listed above for health care.

### 2.2 Applicability of the neoclassical model to health care

The main focus in this section will be on the 'market for physicians'. In the case of the 'market for physicians', the physicians are the producers (of health care services) and their patients are viewed as consumers. Do physicians and patients fit the neoclassical model?

**1. Rationality**

According to the neoclassical perfect competition model, both producers (physicians) and consumers (patients) must be rational. So physicians must be profit maximisers and patients must be utility maximisers (Koutsoyiannis, 1992).

In reality physicians take the Hippocratic Oath, whereby they promise to preserve the life and promote the health of their patients. In neoclassical maximisation language, one could perhaps say that physicians are health maximisers. Is neoclassical profit-maximisation rationality compatible with the rationality of health care, i.e. the promotion of the life and health of patients?

Taking and obeying a Hippocratic Oath is an example of intrinsic motivation, which differs from a mechanical response to incentives (see, for instance, Grant 2011[3]; Sandel 2013[4]). A doctor who has taken the Hippocratic Oath will treat a patient in need of treatment and refuse to give treatment that does not improve the health of a patient. Of course, financial considerations will play a role in a doctor's practice since a doctor cannot treat a patient if (s) he does not have sufficient income to maintain his practice and keep him/herself alive and healthy. But is profit maximisation compatible with the responsibility of a doctor?

What does profit maximisation mean in neoclassical economics? Profits are defined as the difference between revenue (price times output) and costs, and producers are assumed to maximise this difference:

$$\text{Max } \Pi_i = p_i X_i - TC_i(X_i) \text{ ,}$$

where $p_i$ stands for the price of good $i$, $X_i$ is the level of output of good $i$, and $TC_i$ is a cost function representing the total cost of production of the good for each level of output. In a perfectly competitive market, the price level $p_i$ is given. Total costs are given by production techniques, which depend on the state of technology, which is exogenous. Thus producers have only one way to maximise profits, that is, to choose the level of production $X_i$ where total costs are lowest.

Does this represent the aims and behaviour of a doctor? A doctor will treat a patient who comes to see him / her for health advice. If the number of patients approaching him are more than what he could handle the excess patients are sent to other doctors. If he is only getting a few patients to look at he consults for some time and uses his time for other activities. . If profit maximisation means just this − to ensure a balance between income and expenses for a given demand, that is, to ensure that the doctor's work is also financially viable − there appears to be no conflict with the ethical demands of the medical profession. Finance remains subordinate to the ultimate goal expressed through the Hippocratic Oath.

However, problems may arise when profit maximisation becomes a goal in itself. When doctors are asked to become profit maximisers, this opens up the possibility that financial motives start playing a role in the doctor's consideration of a treatment, or even his diagnosis. *(Refer chapter 5 section 5.1 to get a detailed view on how both rationalities differ).*

[3] Grant, R.W. (2011) *Strings Attached. Untangling the Ethics of Incentives*
[4] Sandel, M. (2013) *What Money Can't Buy. The Moral Limits of Markets.*

If profit maximisation conflicts with the Hippocratic Oath, and the neoclassical model is not adequate for health care, the question arises what other model would be adequate to guide the organisation of health care?

Regarding the rationality of patients: their rationality should be the instrumental (utility-maximising) rationality of the representative consumer in neoclassical theory. Utility U is a function of the consumption of goods including the 'commodity' health care. So we can write:

$U = f(C_1, C_2, C_3, \ldots H)$ where H = health care (as a commodity).

Utility is maximised subject to a budget restriction (given by the consumer's income). The condition for utility maximisation is that $MU_H/MU_i = P_i/P_H$ or $P_H MU_H = P_i MU_i$, that is, in equilibrium the value of marginal utility of health care must be equal to the value of marginal utility of any other good (Koutsoyiannis, 1992). This condition implies that when, for example, health care becomes cheaper (and other prices remain the same), then the consumer will consume more of H and less of goods $C_i$ until the balance is restored (Koutsoyiannis, 1992). This can be true only if marginal utility diminishes with each additional unit of good *i* that is consumed. This is the assumption of *diminishing marginal utility* which also means that utility cannot fall to zero or become negative (Koutsoyiannis, 1992) .

For example (Chung, 1994) also describes different kinds of utility functions, for instance the linear logarithmic function which is also a monotonically increasing function. The same applies to the Stone-Geary utility function which "satisfies the classical properties of consumer theory". Similar are other utility functions including the Houthakker Addilog utility function and the Constant-Elasticity-of-Substitution (CES) utility function (Chung, 1994). That "a person prefers more of a good to less" (Nicholson & Snyder, 2007) appears to be an assumption required for the neoclassical model; "more is better" (Nicholson & Snyder, 2007). A continuous utility function exists when "preferences are complete, reflexive, transitive, continuous, and strongly monotonic" (Varian, 1992).Thus, regarding consumers, neoclassical theory assumes that the utility function has the following properties:

$$MU_i = \frac{\delta U}{\delta C_i} > 0$$

and also

$$MU_H = \frac{\delta U}{\delta H} > 0,$$

that is, utility is a monotonically increasing function.

It is clear that, in reality, for an individual consumer utility may fall to zero or even become negative after consumption of a certain amount of good $C_i$. Also regarding producers, many authors have suggested that in reality, firms may pursue other goals than profit-maximisation, for example 'satisfactory profits' or 'satisfactory growth' (Koutsoyiannis, 1992). For example, the literature on 'bounded rationality' suggests that producers are not able to profit-maximise due to lack of accurate information and the existence of uncertainty. However, this does not deny that producers are profit-maximisers and consumers *are* utility maximisers; it merely says that external circumstances do not permit them to *behave* as utility maximisers and profit-maximisers. In their discussion of the map of each individual's infinite number of preference curves, also (Wolff & Stephen, 2012) mention the assumptions of '*nonsatiation'* (Wolff & Stephen, 2012). Thus, while results of 'bounded rationality' and 'satisficing behaviour' have emerged from partial equilibrium studies, it remains unclear whether and how they fit into the overall (general equilibrium) neoclassical model. Is satisficing behaviour consistent with the neoclassical general equilibrium model or does it prevent it to reach equilibrium? From the literature mentioned above it appears that the neoclassical model requires monotonically increasing utility functions.

If this is so, within the neoclassical model, the 'consumption' of health care depends on the price of health care, not on one's health condition. When prices fall, consumption of health care will rise, even for individuals who are in perfect health condition.

Satisficing behaviour is not possible. Neoclassical theory assumes that the utility function has the following properties:

$MU_i = \delta U/\delta C_i > 0$ and also $MU_H = \delta U/\delta H > 0$,

As mentioned earlier neoclassical theory does not assume satisfying behaviour.

What if, in reality, patients seek treatment to cure disease, not to maximise utility? As argued by Kenneth Arrow (1965), unlike the neoclassical consumer, who is never satisfied, the patient who is healed is satisfied. When the illness is healed with the help of a physician, the demand for health care disappears. If such differences between patients and the neoclassical consumer exists, the question is: how to go about the discrepancy?

On the other hand, there is also evidence that patients increasingly show behaviour that reminds of the neoclassical consumer. In reality the patients are demanding more of health care which is contributing to the increasing cost of health care. This is explained in chapter 4 & 5 in (sections 5.2, 4.2.4, 4.1.3 & 6.1.3) where the argument that the US health care system is a market is investigated. Perhaps media attention for medical technology and the broadcasting of television series showing the latest techniques in surgery etc. play a role here (see also point 5 below on preferences). Do they contribute to what John Kenneth Galbraith (1965) has called 'want creation'? And to the evolution of the patient into a neoclassical consumer?

**2. Perfect knowledge**

Following Kenneth Arrow's famous 1963 article on *Uncertainty and the Welfare Economics of Medical Care*, a lot has been written by neoclassical economists on possible 'information asymmetry' in health care. Patients are said to have limited knowledge of the illness as well as the treatment, and to have no choice but to depend on the doctors for advice (Kenneth Arrow). This is also sometimes used as an argument for 'managed health care' (see item 3b below).

Today, however, according to many neoclassical economists, 'information asymmetry' is no longer a serious problem in health care (Hammer, Wilson, Peterson, & Sage, 2003), (J. P. Feldstein, 2012). The assumption of perfect knowledge is no longer violated. Arrow's famous article was written before the 'information age'. Since then, there has been a rapid development in terms of information technology, especially in the use of internet. Today's 'consumers' are said to be more aware about what health care they want (Hammer et al., 2003). Advertising is also believed to enhance the knowledge of consumers (J. P. Feldstein, 2012). Advertising is also criticised for giving only very little information and influencing tastes and preferences of consumers rather than providing them with relevant information which is explained in chapter 4 & 5. On the other hand, a rising general education level of the population and improved access to information may contribute to medical knowledge on the part of patients. Therefore many neoclassical economists no longer consider information asymmetry as a drawback (Hammer et al., 2003), (J. P. Feldstein, 2012). In reality whether perfect knowledge exist in health care is explained in sections 4.1.3, 4.2.4, 5.2, 6.1.3).

### 3. Many participants

### a. Many suppliers

A characteristic of health care that is given much attention in the neoclassical literature is restricted entry. On neoclassical assumptions, this could be the main factor behind the high costs of health care (J. P. Feldstein, 2012). The neoclassical solution would be to increase the supply of doctors. This would increase competition between doctors which would force them to bring down costs. This can be explained with the help of two graphs given below (see Figure 1)

Assuming physicians to be profit-maximisers, a doctor's profit function is given by$\Pi = \mathrm{R} - \mathrm{TC_i}$. In perfect competition, price equals marginal cost and average cost in (long run) equilibrium, e.g. at $p^*$ in the right-hand graph below ($p^* = \mathrm{MC} = \mathrm{AC}$). When costs are perceived as 'too high', NCE will assume that doctors are operating for instance at $\mathrm{p_1}$, that is, above the equilibrium price. If the current price equals $\mathrm{p_1}$, doctors are running profits equal to the size of the area between $\mathrm{p_1}$and $\mathrm{X_1}$ and above $\mathrm{AC_1}$ in the right-hand graph.

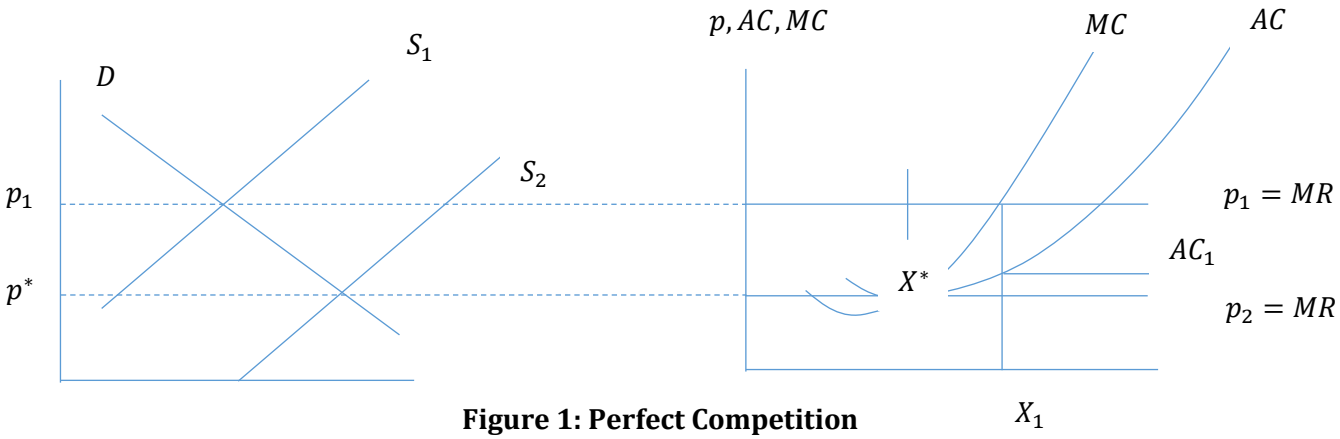



**Figure 1: Perfect Competition**

The 'market price' (i.e. the doctor's fee) is determined by the intersection of S and D in the market (see left-hand graph). Increasing the supply of doctors (from $\mathrm{S_1}$ to$\mathrm{S_2}$) will bring down the price of services by doctors (from $\mathrm{p_1}$to $\mathrm{p_2}$ in the left-hand graph). The fall in price will force each doctor down his/her cost curve (in the right-hand graph). The 'profits' made by doctors will fall until they reach zero (at the point where $\mathrm{p} = \mathrm{MC} = \mathrm{AC}$ ). In sum, competition will bring down above-normal profits (J. P. Feldstein, 2012). How it works in reality is explained in sections 6.1.1.

Another route via which increased competition may bring down costs is through choice of technology. While in the example given above, doctors are assumed to be efficient (operating

at lowest possible cost), another possible reason for high costs in health care could be that doctors are demanding too high prices because they are technically inefficient.

The neoclassical concept of efficient production focuses on the choice between alternative techniques of production, using different ratios of labour and capital. A technique is more capital-intensive when the K/L ratio is higher and is less capital-intensive with lower K/L ratio. Doctors may not be operating at least cost because they are technically inefficient, i.e. operating at a sub-optimal production technique. For instance, they may fail to adjust their capital intensity (the K/L ratio) to a falling relative price of technical equipment. This is illustrated in the graph below (Figure 2).

An *isoquant* (*iso* is from Greek *isos*, equal) connects all the different combinations of inputs that can be used to produce the same quantity of output (Himmelweit et al., 2001) (the convex curve in Figure 2). An *isocost* line connects all combinations of factors of production that can be purchased at the same total cost (line AB in Figure 2) (Himmelweit et al., 2001). Imagine the physicians were not using optimal technique and producing at Y, i.e. at a suboptimal (too low) K/L ratio. Increased competition (following an increase in the supply of physicians) will force the physicians to become more efficient by substituting capital for labour, increasing their K/L ratio until they are producing the same output more efficiently at K1 & L1 at X (Himmelweit et al., 2001).

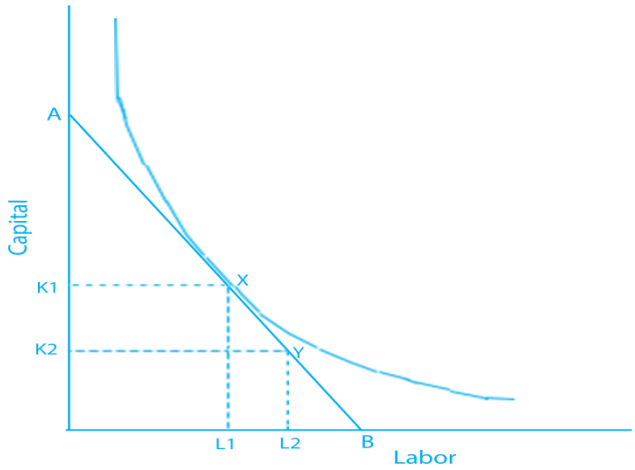



**Figure 2: Capital-Labour Substitution**

Thus, the policy advice on the basis of a neoclassical health care model would be to introduce a 'free market' in health care by removing licensing which would increase the number of doctors and competition between them.

One could argue that this would also improve the quality of health care, on the assumption that competition would force doctors to choose the optimal production technique. However, such a conclusion would be problematic since neoclassical economics focuses on the costs of production techniques, not on their quality. It could of course be argued that competition forces producers (in this case, doctors) to offer the best possible quality, because consumers will not buy goods of lower quality when goods of higher quality are also available. However, this will be the case only to the extent that consumers value quality. The neoclassical assumption of consumer sovereignty regards only consumer preference, and remains silent about quality. Producers will produce whatever consumers want, and it is up to consumers whether they choose good quality.

By neoclassical reasoning, competition would prevent the spiralling of health care costs. This would also make health care more affordable for everyone, since competition would prevent doctors from charging exorbitant fees. However, the question is whether this will work in practice. In general, and in the U.S. in particular, the capital-intensity of health care has increased significantly. But has it reduced costs In order to be able to survive in a competitive market, costs of production should be reduced. Up to a certain point (represented by X in Figure 2) increased capital-intensity may help to reduce costs. However, competitive pressure may induce doctors or hospitals to search for the latest technology and to use more productive vintages of medical technology to shift the isoquant inwards. The same output is then produced at lower cost. That is, total costs per unit of output decline.

However, what are the implications at the level of the individual doctor's or hospital's balance sheet? Due to competition doctors are forced to buy medical devices (refer section 5.1.5, 5.1.7, 5.1.10). You can buy a device only if you have the financial capacity meaning that it is a discrete decision and not a continuous function as shown in figure 2. Unlike what is told in theory you cannot buy half of a machine or you cannot substitute one machine with another (refer section 2.1.4). Medical devices are very costly and to stand up to the competition the doctors are forced to buy the devices (refer section 5.1.5, 5.1.7, 5.1.10). The K/L ratio may rise to the extent that the quantity of K required is no longer affordable for a single doctor, or a single hospital. A solution for doctors may be to leave solo service and go for group service around a shared stock of K (thus achieving economies of scale). However, grouping of doctors (hospitals) would ultimately lead to market concentration and hence oligopoly (see also chapter 6). Thus, economies of scale in health care could ultimately lead to oligopoly and hence deviation from the perfect competition model (refer section 6.1.4,

6.3.3). This may again undo the initial downward effect on prices brought about by competition. The neoclassical perfect-competition model appears to have an in-built tendency to negate itself.

This problem arises as a result of the violation, in reality, of two more neoclassical assumptions on which the isoquant is based, namely, substitutability and divisibility (see item 4 below.)

**b. Many buyers**

When the assumption of 'many producers' is violated in practice, we end up in a second-best world in health care. Within this second best world, the problem of 'too few producers' tends to be remedied by introducing another deviation from the pure neoclassical model, namely the organisation of buyers. The assumption of many buyers appears to be violated in practice by the existence of 'managed health care', in particular Health Maintenance Organisations (HMOs).

A problem with the application of the neoclassical model to health care is that the costs of health care are too high for most patients to afford. Here we touch upon a major difference between the goods market, for which neoclassical economics was invented, and health care. If a particular good is too expensive for a particular consumer, the consumer will look for cheaper substitutes, or decide not to consume the good if his budget does not permit. In the case of health care, this would mean that some, or many, individuals would be denied the care they need to keep healthy and alive. A solution that is often applied in practice is private insurance (Mossialos & Wenzl, 2015). An alternative is tax-financed health care as in Canada (Mossialos & Wenzl, 2015) and the U.K., or some combination of both as in and the Netherlands (Schäfer.W, Boerma, Westert, & Ginneken, 2010) .

Thus, in practice, the state and/or insurance companies tend to become the buyers of health care, i.e. the purchase of health care becomes centralised. Indeed, in practice, a 'health care market' typically consists of organised (oligopolistic) producers on the one hand (Refer Chapter 6 section 6.3).

Standard neoclassical health care economics textbooks such as the one by Paul Feldstein (2012) discusses HMOs as a means to reduce health care costs in the context of a market with three parties, consumers, producers, and insurance companies represented by HMOs. In order to reduce costs, HMOs have formed Preferred Provider Organisations (PPOs). Only those doctors who offer their services at least cost can become part of the PPO. Doctors have to

become part of the PPO to get access to patients. Thus, PPOs are a way of organising price competition in a market that deviates from the standard perfect competition model (refer section 6.3).

In neoclassical terms, a PPO is a monopsony. Monopsony can be justifiable from a neoclassical perspective in cases of imperfect competition. However, monopsony may also lead to 'rent' (Pauly, 1998), (Harrison & Blair, 2010), (Greenberg, 1998). The lower price enforced by the monopsonist may not be passed on to the consumer (the patient), but be absorbed as profits, for instance by profit-maximising insurance companies. (Refer section 6.3)

**4. Substitutability and divisibility**

As already noted above, technical change as represented by an inward-shifting isoquant rests on assumptions of substitutability and divisibility of production factors. In practice, however, there may be limits to substitutability and divisibility. Medical technology may not be divisible and require expansion of the scale of production due to economies of scale. Substitution may require time, or else significant costs (of forced premature depreciation) may be incurred in the short run. In reality doctors are forced to buy medical devices due to competition as they do not have the choice of divisibility as well as substitutability (refer sections 5.1.5, 5.1.7, 5.1.10). This financial pressure leads to doctors leading to leaving their solo practices and grouping together which ends up in an oligopoly (refer section 6.1.4, 6.3.3).

**5. Homogeneous products**

Another assumption of neoclassical model is the homogeneity of products. All products should be homogeneous in nature to fit into the neoclassical perfect-competition model. In the case of health care, however, the service offered by one physician may differ from that of another depending on the acumen of the doctor Schuitmaker (2012). Rather than a single 'market for health care', differences between doctors will lead to many small 'markets' (refer section 5.1.4, 5.3).

Perhaps for this reason, when a 'free market' is suggested for health care, standardisation of health care is often proposed along with it as it would standardise services and treatments. Once health care service is homogenised, differences in service or quality will not be an issue as all doctors would be giving the same treatment (Cannesson & Rinehart, 2012). Standardisation of health care is ensured through "protocollisation" such as check lists in

hospitals Bain and Company (2010). Doctors can only choose from the checklist when they prescribe medicines as well as treatment. This way, 'products' become homogeneous and doctors can only compete on price (refer section 5.3 on standardization).

Thus, standardisation is also a way of reducing price. The lowest price will be offered by doctors who work most "efficiently". Indeed, as Bain and Company (2010) makes clear, this is an important condition for investors to enter the health care 'market' (refer section 5.3 on standardization).

**6. Individual preferences**

According to neoclassical economics preferences are assumed to be utilitarian, and are interpreted in terms of material gain (consumption, profits) and loss.

Two questions arise. First, does (the neoclassical version of) utilitarianism can be applied in particular to health? Second, are individual preferences autonomous, as the neoclassical concept of 'consumer sovereignty' appears to suggest, or subject to influence from outside?

An example of non-utilitarian behaviour which may be relevant to health care (already mentioned above) is satisficing behaviour (Koutsoyiannis, 1992), (Chung, 1994), (Nicholson & Snyder, 2007), (Varian, 1992), (Wolff & Stephen, 2012) . Utilitarianism does not allow for satisficing behaviour. If people cannot be induced to 'consume' more health care when prices fall and to consume less when prices rise, and doctors, too, are insensitive to price signals, optimisation is not possible (refer section 4.2.4 & 5.2). From the neoclassical perspective, a social optimum will not be attained (Koutsoyiannis, 1992), (Chung, 1994), (Nicholson & Snyder, 2007), (Varian, 1992), (Wolff & Stephen, 2012). What would be a solution if satisficing behaviour is important in health care?

Two solutions arise in principle. Either one must conclude that the neoclassical model is not relevant in the case of health care. Or, if one believes on *a priori* grounds that the neoclassical 'free market' is the best model for organising health care, one may choose to try to turn patients and doctors into utility maximisers. (Refer section 5.2)

Indeed, there is some evidence of a growing importance of financial considerations in the choice of treatments and diagnosis by doctors As discussed in Chapter 5 (conclusions regarding rationality) doctors find themselves increasingly under financial pressure as a result of transformations of the health care system, for instance as a result of increasing capital-intensity. Doctors may also experience financial pressure from changes in other sub-systems in society. For example, physicians (or university graduates in general) increasingly find

themselves under financial pressure as a result of educational reforms where society no longer pays for the education of young people (Banjo, 2015), (M Maher, 2006). Do the burden of high student loans, and a health care that increasingly relies on technology, put pressure on physicians to profit-maximise?

Also for patients, various authors have noticed an increase in 'maximising' behaviour as a result of medical advertising or, in terms of Galbraith, 'want creation' (Stanfield & Stanfield, 2010). (Sections 5.2, 4.2.4, 4.1.3 & 6.1.3).

Empirically, a question that arises is whether health care and education systems are designed in a way that permits and enables doctors to keep their Hippocratic Oath. Or are systems being created whose properties promote an evolution of doctors from health maximisers to profit maximisers and of patients from satisficers to maximisers? (Refer sections 5.2, 4.2.4, 4.1.3 & 6.1.3 and conclusion regarding nationality).

Theoretically, a relevant question is whether individual preferences can be influenced by properties of the surrounding system. Can a health care 'market' become a self-fulfilling prophecy?

**7. No externalities**

Consumption of health care generates externalities. The preventive measures that a person takes, for example preventive vaccinations prevents communicable diseases that creates positive externality Also, an individual's health condition is always a concern for others who care for him. Therefore if there is a failure to access the health care negative externality is generated in the society. The standard neoclassical solution is to find ways to *internalise* the externality by pricing them (DeNyse, 2000). According to literature survey neoclassical economists are still trying to quantify these externalities and not much explanation is available on it. Other aspects of externalities (in terms of knowledge) are already explained in section 2.1.7 and 2.1.9).

### 2.3 Market and non-market elements of a health care system

A health care system consists of different elements, in particular, (a) doctors, (b) hospitals, (c) medicines, and (d) medical technology. The question whether health care is a market applies to the first two only (doctors and hospitals). Is medical care a good that can be traded just like apples or bicycles?

Medicines and medical technology, however, are goods. They are produced, and after they are produced, they are bought and sold. Goods naturally require a market in the general meaning of the word, that is, acts of buying and selling. For these two elements of a health care system, therefore, the question is not whether they benefit from opening up to the market; for them, the question is whether a *neoclassical* market − the so-called '*free market*' − is the best (socially optimal) type of market.

A neoclassical market has a series of assumptions attached to it, such as shareholder value maximisation, meritocracy, and increasingly also the privatisation of medical research. Is the application of a *neoclassical* market model to these sectors conducive to lower costs and higher quality of health care? In answering this question (in Ch.4 & 5), I will pay special attention to the following assumptions (the last three in the list of neoclassical assumptions given in Section 2.1).

**1. Maximisation of shareholder value (MSV)**

According to neoclassical economics, private property of capital (which in neoclassical economics means physical capital) will stimulate self-interested owners of capital to accumulate capital (means of production such as machines, tools and factory buildings), which adds to an economy's productive base (Sumantra, 2005), (William, 2011). Thus, profit maximisation is believed to maximise output. A modern version of this thesis – for the modern stock-based society − is the idea that the economy as a whole will benefit if shareholders (and the firms they own) maximise shareholder value (MSV) (Sumantra, 2005), (William, 2011). Within the context of this thesis, the question whether MSV promotes social benefit is relevant particularly with regard to the pharmaceutical industry and medical technology. Implications of the application of MSV in pharmacy and medical technology are investigated in Ch. 4. (Refer section 4.1.5, 4.2.6, 5.1.9).

**2. Intellectual property**

According to neoclassical economics patents should be allowed as it gives the producer of knowledge the right to own it and prevents free ride for others which can otherwise lead to externality (Siddiqi, 2005), (Vallee & Yildizoglu, 2004) (refer section 2.1.7 & 2.1.9). Patents are very important when it comes to pharmaceuticals as well as medical devices and chapter 4 investigates to what extend patents are welfare enhancing (Siddiqi, 2005), (Vallee & Yildizoglu, 2004). (Refer sections 4.1.2, 4.1.6 & 4.1.7).

## 3. Meritocracy

The question of affordability concerns all neoclassical markets, but becomes more pressing in the case of health, where ability to afford medicine or medical technology may mean the difference between illness and health, or even life and death. In neoclassical economics, affordability is determined by one's budget constraint, or one's income. On neoclassical assumptions, an individual's income represents this individual's marginal productivity, and this is justified on meritocratic grounds Kraus, V. (1990).

However, marginal productivity is a theoretical concept with some complications attached to it. Since it is almost impossible to measure marginal productivity empirically (since productivity of each person is influenced by the productivity of others), neoclassical theory circumvents the measurement problem by assuming (on theoretical grounds) that an individual's *actual* (profit or wage) income reflects one's contribution to the overall product. In order to empirically prove the neoclassical idea that, for instance, a wage reflect the worker's marginal productivity, neoclassical economists see no option other than to assume that wages found in reality reflect marginal productivity. Thus, the relationship between income and productivity is impossible to falsify.

Apart from methodological problems, the idea that one's ability to afford goods (including medicines and medical technology) depends on one's productivity raises philosophical questions. Medicines and health care services unlike other goods should be made available for people based on their health requirements and not according to what they can afford to buy.

In sum, for the subsystems of a health care system where a market is appropriate (the production of medicines and medical technology), the question is: are neoclassical features such as MSV, intellectual property and meritocracy appropriate elements of a market for medicines and medical technology? Do these neoclassical features help to reduce the costs and improve the quality of health care is explained in sections 4.1.6, 4.2.7, 5.1.9.

## Conclusion

For a particular societal activity − in our case, health care − to be turned into a *neoclassical* market, the assumptions of the neoclassical market model have to be satisfied.

If neoclassical assumptions do not hold, there are basically two possibilities. Either, one must conclude that the neoclassical model does not hold, in which case a new model is needed to guide the organisation of health care. (I will come back to this possibility in Ch. 7) Or, if one believes on *a priori* grounds that the neoclassical free market is the best model for organising health care, reality may have to be adjusted to the model. That is, physicians may have to be turned into profit maximisers, patients into utility maximisers, *et cetera*.

The question that will be investigated in the following chapters then is how welfare-enhancing it would be to change reality in order to more closely fit the neoclassical model. For certain assumptions, changing reality in order to make more closely fit the neoclassical model may be socially beneficial. For instance, if modern technology such as the internet reduces asymmetric information and brings society closer to 'perfect information', the change could involve social benefit. However, other neoclassical assumptions raise questions of a more problematic and much more fundamental nature. For instance, would turning physicians into profit maximisers enhance welfare, or destroy morality? Similarly, would standardisation of physicians enhance welfare or destroy basic human rights, in particular free thinking?

## 3. Factors contributing to major costs in Health care in Canada, Netherlands and US & Suggestions to bring down cost:

### Introduction

In this chapter I investigate the main cost factors in health care in Canada, the Netherlands and the United States of America. The major reasons cited are increase in pharmaceuticals expenditure, hospital expenditure and physician expenditure and medical technology expenditure. Always cited threat for the burgeoning cost of health care is the aging population but studies show that the aging population has contributed to less than 1% of the total increase in health care expenditure from 1975 to 2014. An analysis of the factors that have led to the cost increases is undertaken in chapter 4 & 5.

### 3.1 Health Care System – Canada

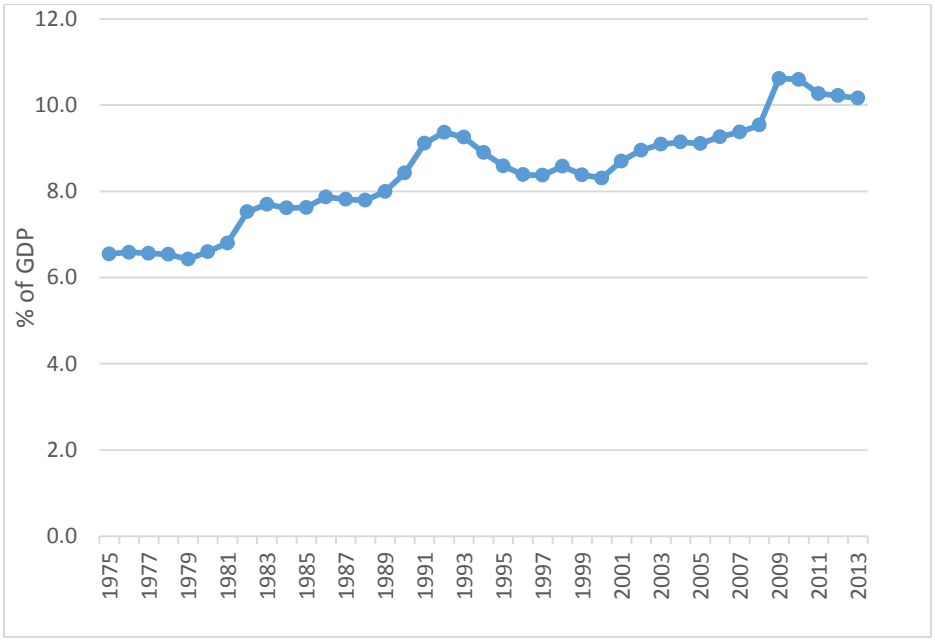



**Figure 3:Total health care expenditure as a percentage of GDP 1975 to 2014**

**Source: OECD Health statistics 2015**

The total health care expenditure in Canada has increased from 6.5% of GDP in 1975 to 10% of GDP (Gross Domestic Product) in 2013 (OECD.Stat, 2015). In Canada all citizens are covered under Medicare (Mossialos & Wenzl, 2015). This does not mean that Canada has a single health care system. Each province is responsible for their own health care (Mossialos & Wenzl, 2015). There are 14 publicly funded health care systems- 10 provincial, 3 territorial and one federal (Mossialos & Wenzl, 2015). All the necessary hospitals and physicians are covered across the province by Medicare (Mossialos & Wenzl, 2015) . Medicare covers all

the basic health care needs of the citizens except for dental and prescription drugs (Mossialos & Wenzl, 2015).

Almost two third of the Canadians have private insurance (Mossialos & Wenzl, 2015). Those cares which are covered under Medicare is not covered under private insurance (Mossialos & Wenzl, 2015). Services like dental, prescription drugs and home care are covered by private insurance (Mossialos & Wenzl, 2015). Provincial support is there for the vulnerable population who cannot afford private insurance. Medicare is funded through taxation (Mossialos & Wenzl, 2015). The fund is transferred by the federal government to the provinces via transfer payment (Mossialos & Wenzl, 2015). According to (CIHI, 2014) [Canadian Institute of Health Information] government funding constituted 70.5% of the total health care expenditure in 2014, and 12.2% by the private insurance (CIHI, 2014). Out of pocket spending was 14.2% in 2014 (CIHI, 2014). In Canada doctors have fee for service payment system (CIHI, 2014). Most of the hospitals exist on a not-for-profit basis owned by religious institutions, universities, governments municipalities or corporations (Mossialos & Wenzl, 2015).

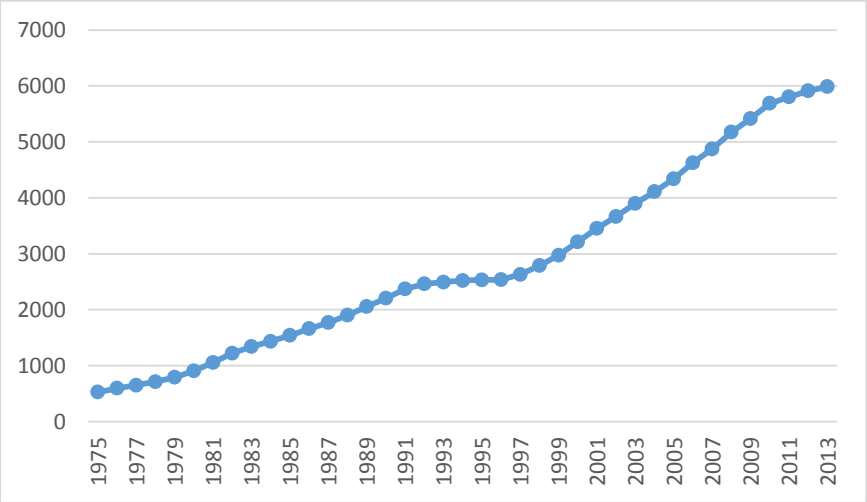



**Figure 4:Total Per capita health care spending 1975 to 2013**

**Source: Canadian Institute for Health information 2014**

Health care expenditures in Canada are growing (CIHI, 2014). When we talk about the overall increase in health care expenditure, it is very interesting to note the per capita (per person) increase in health care expenditure (CIHI, 2014). The per capita expenditure which was $ 474 in 1975 has increased to $4429 in 2014 showing 834% growth(CIHI, 2014).

### 3.1.1 The health care cost drivers: Supply Side

Cost drivers are factors that bring about increased spending on health care (CHSRF, 2011).Most of the cost drivers are intertwined so that they produce a synergy effect on the overall cost of the health care system (CHSRF, 2011). For example, even if physicians are considered in isolation, but the effect of the decision made by physicians have a direct effect on the cost incurred by the hospitals as well as the pharmaceutical sector (CIHI, 2008). Some of the major cost drivers identified are hospitals expenditure, introduction of new drugs and growth in the use and price of drugs, increase in physician expenditure and introduction of new medical technology and its use (CIHI, 2008).

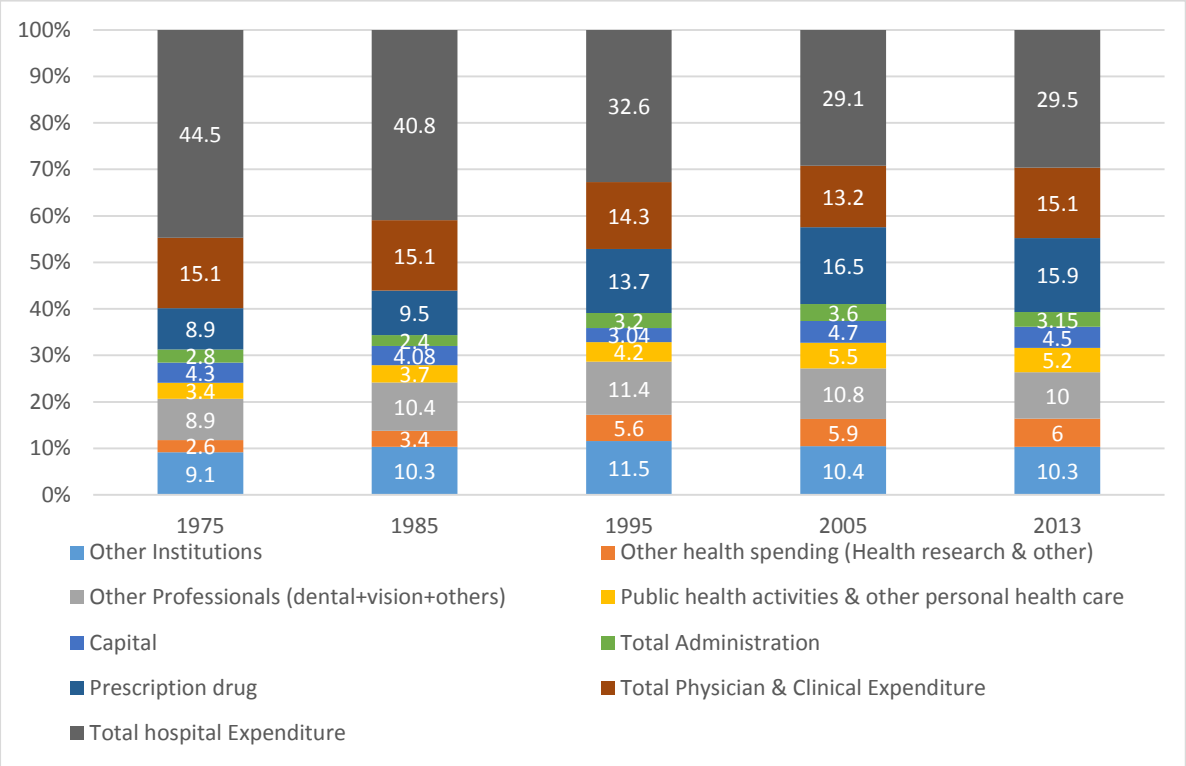



**Figure 5:Percentage contribution of each factor to the total health care spending per capita**

**Source: Canadian Institute for Health information 2014**

#### 3.1.1.1 Hospitals

Hospitals would be responsible for almost 30% of the overall health care expenditure in 2014, of which 90% would be taken care by the public sector(ProvincialandTerritorialMinistersofHealth, 2000). The per capita hospital expenditure has increased from $235 in 1975 to $1770 in 2013 Even though the hospital expenditure has increased over time it is interesting to note that the number of hospitals have decreased over time (CIHI, 2014). There were 787 hospitals in 2000 which decreased to 720 in 2013

(OECD.Stat, 2015). The number of hospital beds and the length of stay of patients are also showing a decreasing tendency (OECD.Stat, 2015). The hospital bed density per 1000 patients which was 6.8 in 1980 decreased to 2.7 in 2013 (OECD.Stat, 2015). The average length of stay per patient which was 10(days) in 1980 has decreased to 7.5 (days) in 2013 (OECD.Stat, 2015).

The main reasons cited as the reasons for the increase in hospital expenditure are increase in physician expenditure, increase in cost of the prescription drugs and increasing trend in the adoption of medical technology (CIHI, 2008).Health care sector as such is labour intensive(CIHI, 2008). 60% of the overall costs of hospitals is due to compensation given to the work force especially physicians (CIHI, 2008). Physicians have a fee for service remuneration which is explained below (CIHI, 2008).

#### 3.1.1.2 Physicians

Physician expenditure constitute almost 16% of the total health care expenditure in Canada. The per capita physician expenditure which was $ 80 in 1975 grew to $ 905 in 2013 (CIHI, 2014). Two main causes for the growth cited are the increase in physician fee and the increase in the utilization rate of the physicians (CIHI, 2008). Increase in Utilization rate and the physician fee can be explained on the basis of the fee for service system for Physicians that Canada follows (CIHI, 2008). According to fee for service system, more treatment renders more fees for the doctors (CIHI, 2008). Consultation per capita has increased from 5.6 in 1975 to 7.8 in 2013.The average growth in physician fee from 2000-2013 alone was 4% (CIHI, 2014) .

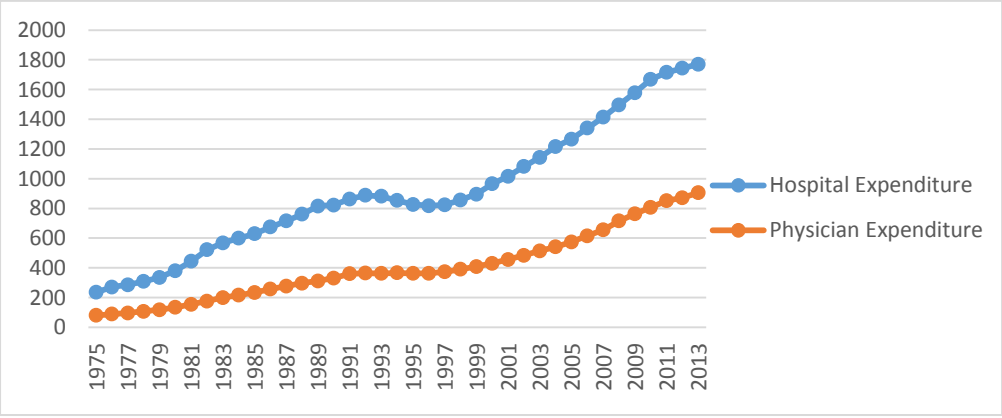



**Figure 6:Hospital & physician expenditure per capita (1975-2013)**

**Source: Canadian Institute for Health information 2014**

### 3.1.1.3 Drugs & Medical Technology

Retail sales of prescribed and non-prescribed drugs together would constitute almost 16% of the total health care expenditure in 2013 (CIHI, 2014). Over the last two decades prescription drugs have been the major contributor of health care expenditure (CIHI, 2014). The per capita expenditure of prescription drug which was $47 in 1975 grew to $975 in 2013 (CIHI, 2014). Increased volume of use is one of the major reasons resulting in increase in expenditure (CIHI, 2014). The average number of prescriptions filled per capita rose from 7.8 to 12 between 1995 and 2005 (CHSRF, 2011). Generic prices were approximately 60% of the prices of the brand name pharmaceuticals. Canada has tried to come up with policies which limit the prices of generic drugs between 25% and 56% of the brand name products which helped to bring down the cost in 2012-2013 period (CIHI, 2014). The total per capita expenditure on drugs from 1975 to 2013 is given below (CIHI, 2014).

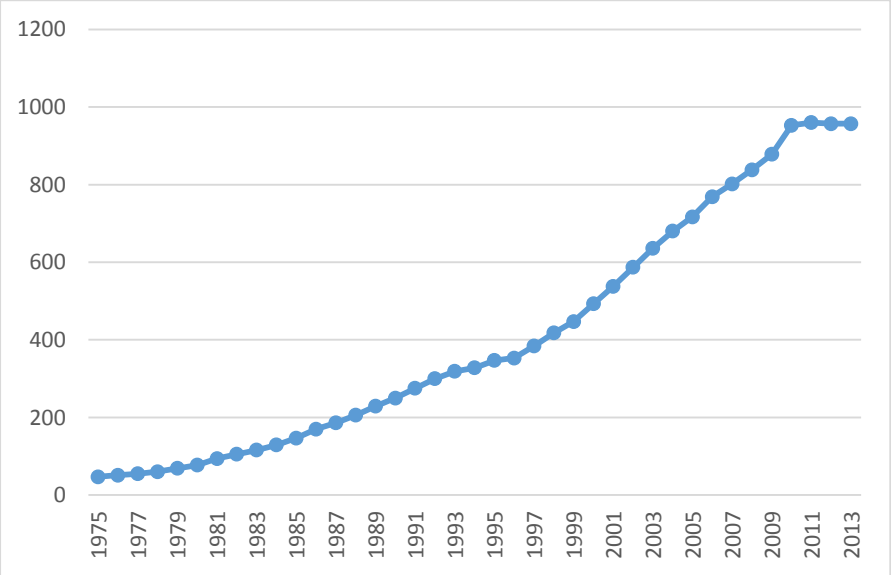



**Figure 7:Prescription drug expenditure per capita (1975-2013)**

**Source: Canadian Institute for Health information 2014**

Technologies refer to medical devices, robotic devices and IT technology. Technological change involves, introduction of new products and changes in clinical practices(CIHI, 2008). Unlike other countries Canada has been a slow adopter of medical technologies (CIHI, 2008). 55 countries spend more than Canada on medical devices per capita as a percentage of total health spending per capita on average over 2006-2011 (CanadianHealthPolicy, 2013). Medical device market per capita accounted for only 0.36% of GDP per capita from 2006-2011 (CanadianHealthPolicy, 2013). The medical technology per capita which was $145 in 2006 grew to $190 by 2013 (CanadianHealthPolicy, 2013). According to this trend has

started changing and more and more devices are coming into the market which is adding to the total health care cost (CIHI, 2014). The medical technology per capita which was $145 in 2006 grew to $190 by 2013 (CIHI, 2014). This is why medical technology is also mentioned as a cost driver in Canada (CIHI, 2014). Medical technology (per million population) which was 7.8 (devices) in 1990 grew to 24 (devices) in 2013 (OECD.Stat, 2015). Utilization of medical technology per thousand people which was 112 in 2000 increased to 185 in 2013 showing a growing tendency (OECD.Stat, 2015).

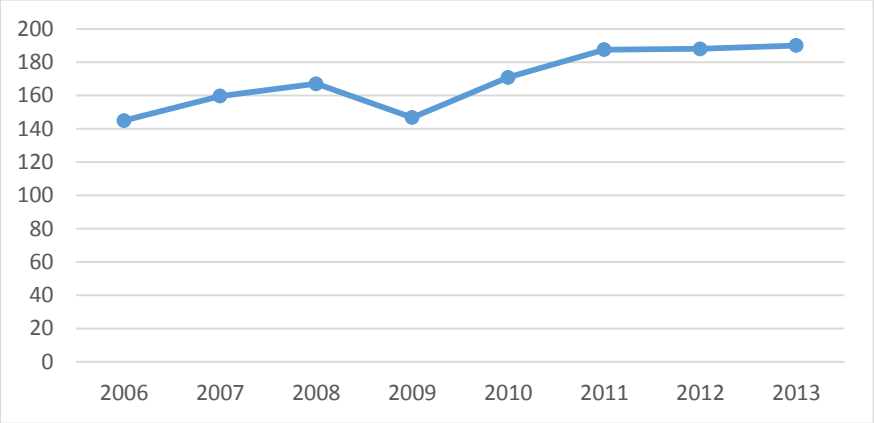



**Figure 8:Medical Technology expenditure per capita (2006-2013)**

**Source: Canadian Advanced technology Alliance 2013**

### 3.1.2 Population aging: Demand Side

Any developed country faces the constrain of increasing proportion of the elderly people (Hammami & Sghari, 2014). This factor cannot be discarded as individual health care expenditure is an increasing function of age (Hammami & Sghari, 2014).

The Canadian population is expected to grow from 33.9 million in 2012 to 42.8 million in 2037 (CanadianInstituteofActuaries, 2013). The population is expected to grow at 0.9 percent annually (CanadianInstituteofActuaries, 2013). The growing population of the seniors are also increasing very fast (CanadianInstituteofActuaries, 2013). The life expectancy of the Canadians have increased dramatically and by 2056 it is estimated that about 13 million would be aged 65 which would be 30% of the total population (PublicHealthAgency, 2014). According to (CIHI, 2014) the growth is a function of changing birth, mortality, immigration and emigration rates. The most important factor to be taken into consideration is the baby boomer generation which is turning 65 (CIHI, 2014). It is assumed that the aging population will strain the federal government's health care budget. However, studies show that the contribution of the aging population on the total health care expenditure would be very modest (CIHI, 2014). Average contribution of the aging population on cost would be 0.9%

per year (CIHI, 2014). Aging has only contributed to 0.6% on the physician spending, 1.1% on drugs as well as 1.1% on hospitals until 2012(CIHI, 2014). Since age is not a major contributor to cost, it is not considered in the future chapters for analysis.

### 3.2 Health Care System – United States

The US does not have a health care system as such in place like in Canada, where the health care system is government run. In the U.S, even though there are both private as well as public institutions that manage the health care delivery system, most of the health care facilities are run by private institutions drugs (Mossialos & Wenzl, 2015).

Health care coverage is in the hands of multiple players (Mossialos & Wenzl, 2015). Insurance coverage is provided by the employers for the employees (Mossialos & Wenzl, 2015). This covers only a little more than half of the population. A quarter of the population is covered by the government by Medicare and Medicaid (Mossialos & Wenzl, 2015). 5% who can afford to buy their own insurance is covered by their own insurance. 15% have no insurance (Mossialos & Wenzl, 2015). This is a major problem that US faces with the burgeoning cost of health care. Benefit package include inpatient and outpatient care and physician services (Mossialos & Wenzl, 2015).

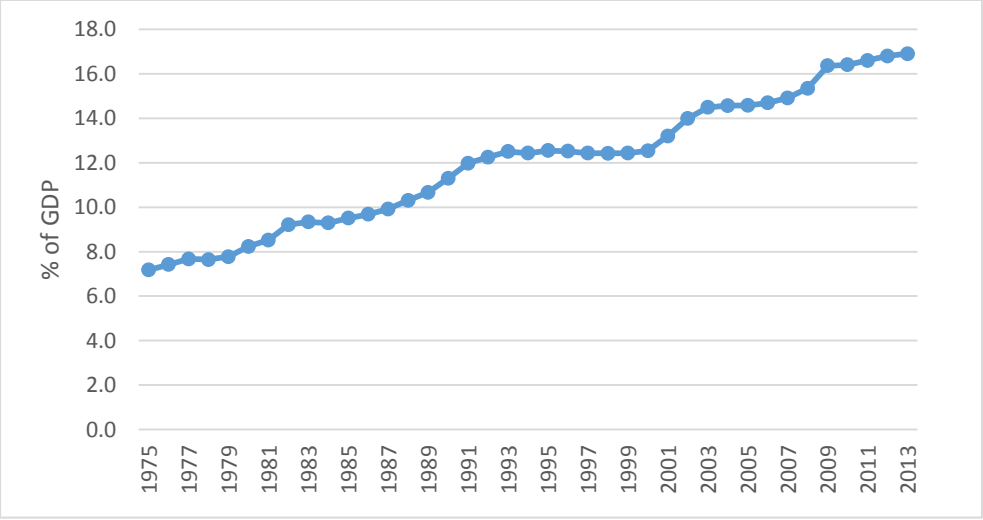



**Figure 9:Total Health care Expenditure as a percentage of GDP (1975-2013)**

**Source: OECD Statistics 2015**

Health spending is a product of the price of the health care services and the utilization of those services (OECD.Stat, 2015). In 2013, US spent about 17% of their GDP on health care which was roughly $ 2.9 trillion dollars (OECD.Stat, 2015). The health spending in the US was never this high and it doubled only in the last thirty years (OECD.Stat, 2015). The per

capita spending on health care has increased from 1112 million dollars in 1980 to 9267 million dollars in 2013 showing 733% growth rate (NHE, 2014). US has high health care spending compared to other developed countries like the UK (9.6% GDP), Germany (11.6% GDP) and Japan (9.5% GDP) (OECD.Stat, 2015). The rapid increase in health care expenditure has imposed a heavy burden on the people that the money that has to be utilized for other activities is now redirected to health care (Mossialos & Wenzl, 2015) . It is also imposing a heavy burden on the federal government in terms of Medicaid and Medicare (Mossialos & Wenzl, 2015).

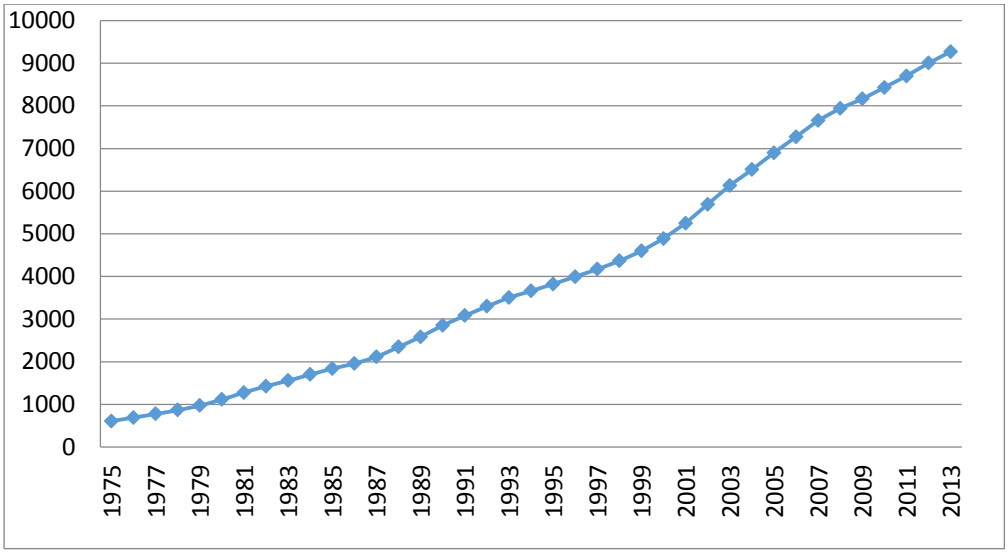



**Figure 10:Total per capita health care expenditure (1975-2013)**

**Source: National Health Expenditure USA 2014**

### 3.2.1 The health care cost drivers: Supply Side

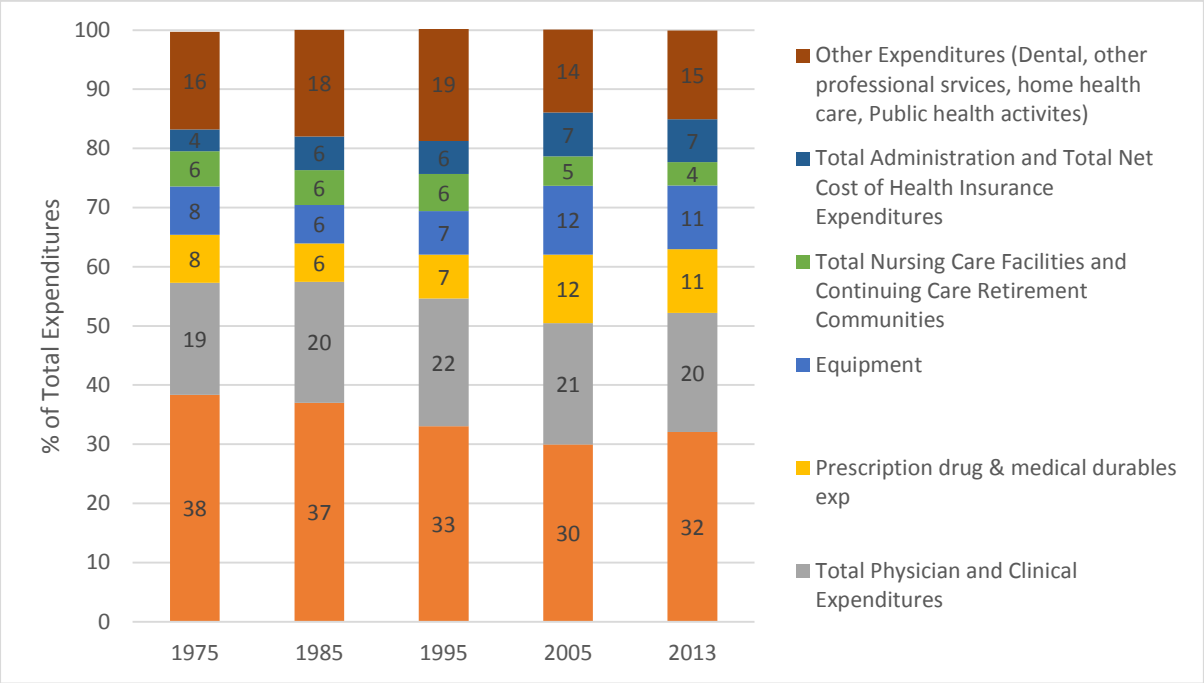



**Figure 11:Percentage contribution of each factor to the total health care spending per capita**

**Source: National Health Expenditure USA 2014**

Some of the major cost drivers identified are the increased expenditure of hospital care, physician and clinical service expenditure, introduction and increased usage of prescription drugs as well as medical technology (BipartisanPolicyCentre, 2012). The ageing population is also considered as a threat as far as the demand side is considered but its overall effect on the health care cost is very minimal (BipartisanPolicyCentre, 2012).

#### 3.2.1.1 Hospitals

Total hospital expenditure is estimated to have grown from 51,234 million dollars in 1975 to 936,867 million dollars in 2013 (NHE, 2014). The per capita expenditure has grown from 233 dollars in 1975 to 2974 dollars in 2013 showing 1177 % growth (NHE, 2014). Hospitals are largely consolidating into single large units (NHE, 2014). The number of hospitals have decreased from 5810 in 2000 to 5723 in 2013. In 1996-97 the number of single solo physicians were 41% which dropped to 33% in 2004-2005 and the same tendency is followed till now (NHE, 2014). There is high concentration of hospitals in particular regions. Consolidations have led to inpatient price hike by at least 5% (BipartisanPolicyCentre, 2012).

The number of hospital beds per 1000 people have decreased from 6 in 1980 to 3 in 2013 (OECD.Stat, 2015). It is also interesting to note that the average length of stay also has reduced from 6.4 days in 1990 to 4.8 days in 2013 (OECD.Stat, 2015).

The major reasons cited for the increase in health care expenditure are medical technology expenditure, increasing pressure from remuneration for health care workforce and increase in prescription drugs expenditure (BipartisanPolicyCentre, 2012).

#### 3.2.1.2 Physicians

Physician spending is estimated to have grown from 25,309 million dollars in 1975 to 586, 67 million dollars in 2013 (NHE, 2014). The per capita physician expenditure which was 115 dollars in 1975 increased to 1862 dollars in 2013 showing 1518% growth (NHE, 2014). Most health care services provided in the US are based on fee for service (FFS) basis, meaning more services gives more incentives. In 2008 FFS comprised 78% of all insurance in the US. The remuneration to doctors which was 204900 $ in 1990 has increased to 3, 90000 in 2013 (OECD.Stat, 2015). The consultation per capita of the physicians have increased from 3.3 in 1995 to 4 in 2013. The physician density per thousand people has not increased considerably in the US. The physician density which was 2 in 1993 increased to 2.6 in 2013 (OECD.Stat, 2015).

In the US medical errors are high and this has led to $17 billion in health spending average every year (BipartisanPolicyCentre, 2012). Jury awards in malpractice law suits have doubled over the years (BipartisanPolicyCentre, 2012). Fearing malpractice law suits, doctors usually prescribe more tests commonly known as defensive medicine and it is estimated to cost approximately $450 billion to over $650 billion per year(BipartisanPolicyCentre, 2012). How the FFS system works and how it contributes to increasing costs would be explained in the coming chapter.

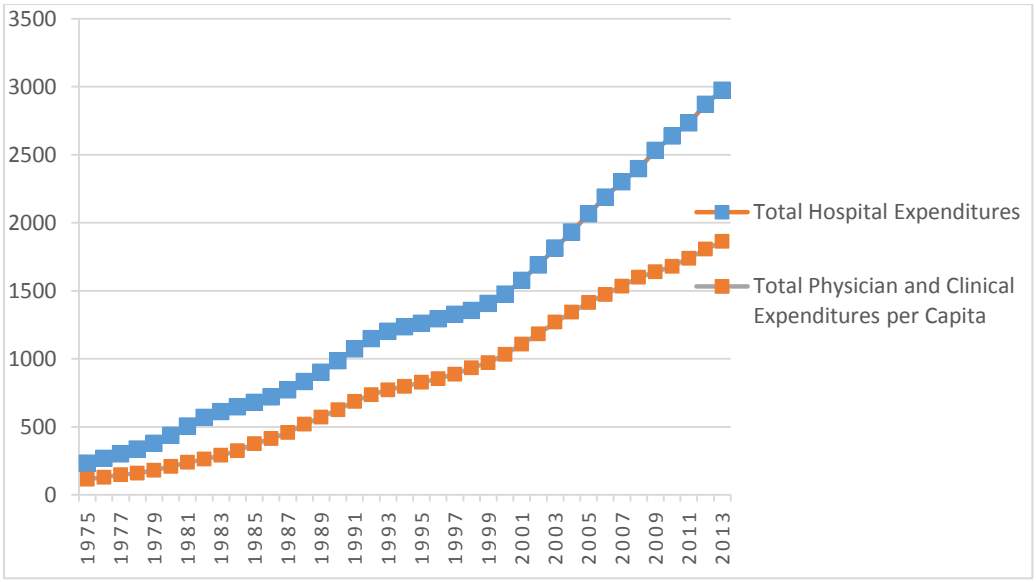



**Figure 12:Prescription drug expenditure per capita (1975-2013)**

**Source: National Health Expenditure USA 2014**

### 3.2.1.3 Medical technology:

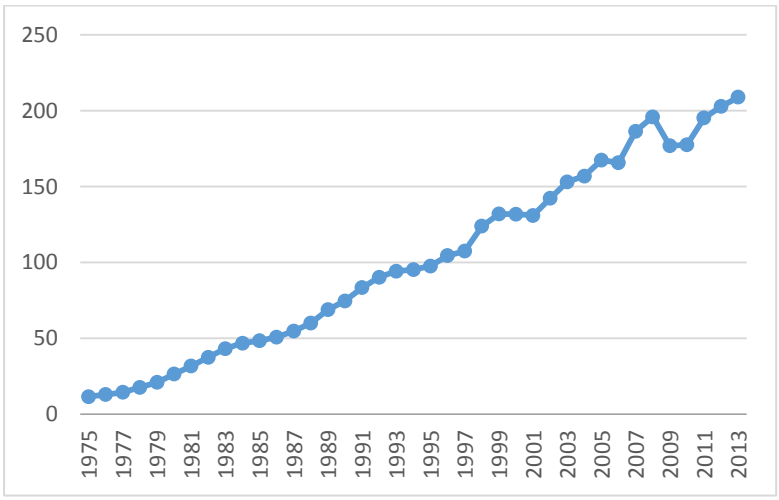



**Figure 13:Medical Technology expenditure per capita (2006-2013)**

**Source: National Health Expenditure USA 2014**

Advances in medical technology is also a major reason for the increase in health care costs (BipartisanPolicyCentre, 2012). The medical technology market itself is almost $200 billion encompassing a wide range of innovations, led by diagnostic imaging, and procedures. The medical technology expenditure which was 2538 million dollars in 1975 increased to 65,785 million in 2013 (NHE, 2014). The per capita expenditure on medical technology was 12 dollars in 1975. By 2013 the per capita expenditure reached 209 dollars showing 1710% growth (NHE, 2014). The number of equipment per million population has increased from 38

in 1997 to 80 in 2013 (OECD.Stat, 2015). The utilization of technology per thousand people also has increased from 180 in 2000 to 364 in 2013 showing a growth of 100% (OECD.Stat, 2015). There has been a small reduction in medical technology in the year 2008 mainly due to recession(BipartisanPolicyCentre, 2012). The analysis of how the medical technology industry works in the US and how it contributes to cost would be discussed in the coming chapter.

#### 3.2.1.4 Prescription drugs

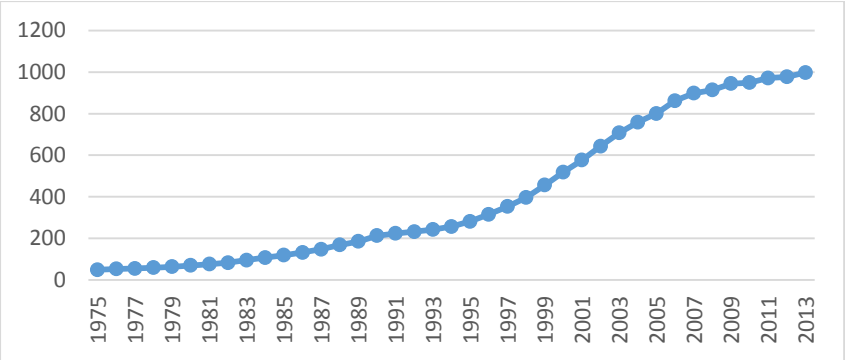



**Figure 14:Prescription drug expenditure per capita (1975-2013)**

**Source: National Health Expenditure USA 2014**

In 2013, prescription drug accounted for $ 271, 09 million of national health care spending. In 1975 the prescription drug expenditure was only 8,052 million dollars (NHE, 2014). The per capita spending has increased from $49 in 1975 to $997 in 2013 showing a growth of 1921% (NHE, 2014). The main reasons are rising drug prices, rapid introduction of new drugs and increase in utilization. The utilization rate has increased from 43.5% in 2000 to 49% in 2013 (NationalHealthExpenditures, 2013).

### 3.2.2 Population aging: Demand Side

It is a common notion that population aging is going to be a threat to the future health care expenditure. But studies show that this is only a myth (BipartisanPolicyCentre, 2012). According to studies aging is too gradual a process and it is over rated when it comes to health care costs (BipartisanPolicyCentre, 2012) . If 50 to 70 percentage of the people are getting older, then the impact of the elderly on the health care expenditure would be of high magnitude (BipartisanPolicyCentre, 2012). But fortunately that's not the case with the US. By 2030, the US population aged 65 would rise fewer than ten percentage point (BipartisanPolicyCentre, 2012). The aging US population has contributed to only 0.5 percentage to the overall cost of health care (BipartisanPolicyCentre, 2012). So aging baby

boomers are never a threat to the health care expenditure (Reinhardt, 2003). As the case with Canada, since aging is not a major contributor to health care costs, it would not be taken as a criteria for further research.

### 3.3 Health care system- Netherlands

The health care system in Netherlands is rooted in the "Bismarckian" social insurance tradition (Schäfer.W et al., 2010). In 2006, fragmented health care system between private health insurance and compulsory health insurance with health funds was abolished and a single compulsory health insurance scheme was established. This was the first time, health insurance was opened to market where insurance companies compete for insured persons (Schäfer.W et al., 2010). The role of the government was confined to that of a supervisor, and thus a "managed care system" came into being in Netherlands (Schäfer.W et al., 2010). The Dutch health care system has 3 compartments, a) long term and high cost treatment (AWBZ) which is mandatory for all. Second compartment consists of the essential curative care (ZvW) which is also mandatory (Schäfer.W et al., 2010). Third compartment is the luxury health care which is optional or voluntary. The physicians are paid on a fee for service basis and most of the hospitals are non for profit organizations (Schäfer.W et al., 2010).

Due to language constrain, not much details could be collected on Dutch health care system. Study on Dutch health care system can be carried on as a future research.

#### 3.3.1 The health care cost drivers: Supply Side

The cost of health care is increasing exponentially in Netherlands. Since 2000, health care expenditure has increased by an average of 4.5% per annum, which is almost 3 times more than the growth of our economy (OECD.Stat, 2015). In 1975 the health care expenditure was just 6.3% of GDP (OECD.Stat, 2015). By 2013 it grew to 11.1% of GDP (OECD.Stat, 2015). The per capita expenditure which was $420 in 1975 has become $ 5131 in 2013 showing 1221% increase (OECD.Stat, 2015). Even though Netherlands is performing better when compared to other developing countries, the burgeoning health care cost is not sustainable (OECD.Stat, 2015).

On the supply side the main reasons cited are expensive new technologies, treatment methods and volume incentives for health care providers (McKinsey&Company, 2013).

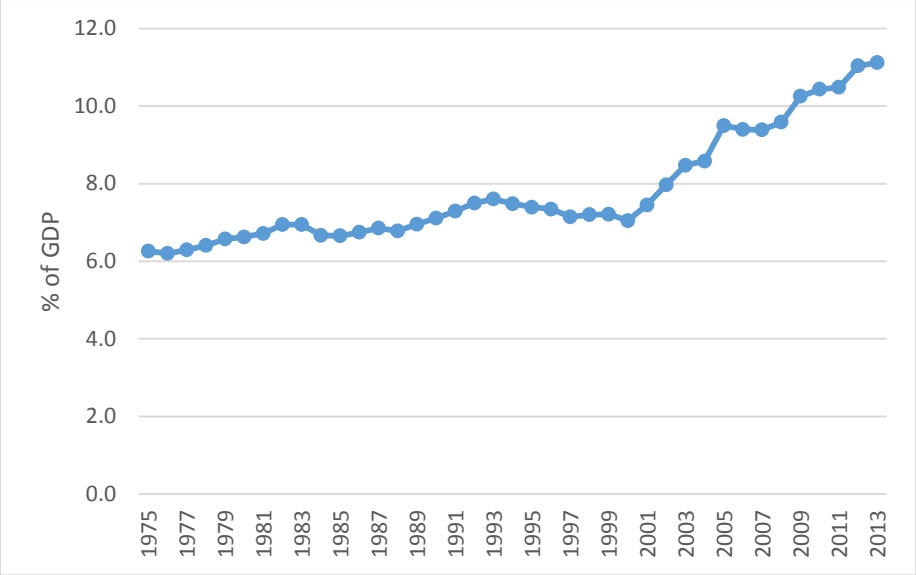



**Figure 15:Total Health Care Expenditure as a percentage of GDP (1975-2014)**

**Source: OECD Statistics 2015**

### 3.3.1.1 Medical technologies & Pharmaceuticals

Technological innovations have brought in so many advantages to medical field. But when the benefits are compared to the costs incurred the effect of the benefits are diminished. Now technology industry is also focused on "niche market" by developing tests, procedures and technology for individual patients. Since it is customized there is lower volume sales and this leads to the increase in cost of the specific technology there by the health care cost. (McKinsey&Company, 2013). In Netherlands the equipment per million population has increased from 8.2 in 1990 to 23 in 2013(OECD.Stat, 2015). The utilization (per 1000 population) has increased from 99 in 2007 to 121 in 2013 showing 22% increase(OECD.Stat, 2015).

The expenditure of pharmaceuticals as a percentage of total health care expenditure was 9% in 1975 (OECD.Stat, 2015). It increased to 12% in 2013 (OECD.Stat, 2015). The per capita expenditure which was 42 dollars has increased to 397 dollars in 2013 showing a growth of 845% (OECD.Stat, 2015). The pharmaceutical consumption per thousand per day increased from 135 in 2000 to 215.7 in 2013 showing 80% increase (OECD.Stat, 2015).

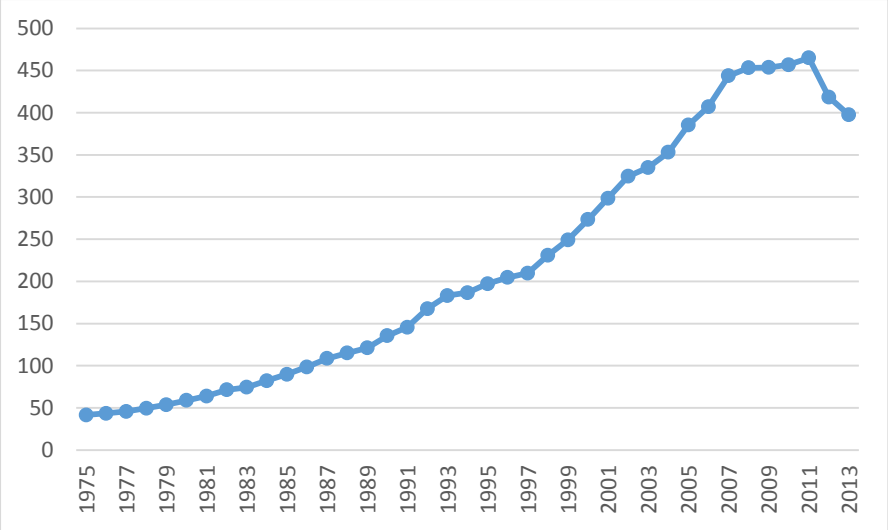



**Figure 16:Prescription drug expenditure per capita (1975-2013)**

**Source: OECD Statistics 2015**

### 3.3.1.2 Physicians

After 2006, market was introduced into the health care system. Earlier doctors had to consider options with in the set budget. Now the incentives depend on the volume or increase in services. So denying a patient a medical service on the grounds that he does not require any medical service does not fetch any incentives and this leads to increase in cost (McKinsey&Company, 2013). Consultation per capita has increased from 4.9 in 1980 to 6.2 in 2013.

### 3.3.2 Population ageing: Demand Side

The baby boomers are getting older. Between 2010 and 2040 the number of people aged above 65 are going to rise by around 70%. But like the US and Canada, the impact of aging on health care expenditure is very minimal. The positive aspect is that the cost required to cover long term care is through collective funding (insurance) which could reduce the burden when compared to many other countries where the individuals have to make their own arrangements. (McKinsey&Company, 2013).

### 3.4 Proposals put forward to curb health care costs

The cost of health care is increasing exponentially. It is a major crisis in Canada as well as Netherlands (Hill & Powell, 2009a). In the US, the system is anticipated to bankrupt the country (Hill & Powell, 2009a). Even though the present system is threatening to bankrupt the country, little focus is paid on how to make the health care system affordable (Hill & Powell, 2009a).

**Some of the commonly proposed solutions are explained below:**

#### 3.4.1 Standardization of Health care delivery

"Standardization is reduction of variation in a process with the intent of improving compatibility, interoperability, repeatability safety, affordability and other elements of quality. Standards is not a new concept and have been in health care for long (Legg, 2014). The Code of Hammurabi inscribed on a stone pillar before 1750 BC included laws relating to the practice of medicine in Babylon (Legg, 2014) . Standards are given a lot of different names in health (Legg, 2014). Titles like policy, procedure, protocol, work instructions, guideline, handbook, rules, statement, code of conduct, regulation, benchmarks and law may be used to describe a standard" (Legg, 2014).

According to (Cannesson & Rinehart, 2012) health care also should follow the same path as of civil aviation. Civil aviation adopted the use of automation, specific guidelines and use of checklists to enhance safety. It is high time the same strategy is adopted by the health care industry (Cannesson & Rinehart, 2012). Standardization and protocols helps in the reduction of errors and under performance (Cannesson & Rinehart, 2012) . In medicine there are objective ways to measure pain and even sympathetic response (Cannesson & Rinehart, 2012). "Surgical Stress Index" (SSI) is an apt example (Cannesson & Rinehart, 2012). This shows that even standardization of feelings like pain and emotions are also possible (Cannesson & Rinehart, 2012). Standardization improves efficiency as it brings outliers close to the mean of performance and thus improve efficiency (Cannesson & Rinehart, 2012). In the US especially, for the same disease different doctors prescribe different treatments. Standardization of treatment by the implementation of guidelines and checklists are the commonly proposed solutions to bring uniformity in treatment and reduce cost. (Bain&Companyhealthcare2020, 2012). When the condition of a patient is entered into the system, the checklists would give them instructions on what tests have to be performed and what medications have to be given (Bain&Companyhealthcare2020, 2012). According to (Bain&Companyhealthcare2020, 2012) standardization is inevitable for health care as it

reduces errors and reduce cost. Guidelines are more secure as it is something “tried & true”. The report shows that the number of doctors using checklists for prescribing drugs as well as treatment are going to increase exponentially. The current trend of physicians and other providers using more guidelines and protocols are called “protocolization”. This clearly shows that physicians are not the only decision maker regarding treatment of a patient. Health care which has always been a cottage industry is being industrialized now. (Bain&Companyhealthcare2020, 2012).

In health care different departments together come into play for the efficient treatment of the patient. Interoperability is a basic feature of health care and it helps in making health care safer, efficient and effective (Legg, 2014). But to ensure success of interoperability standardization is inevitable as it involves transmission of data, common terminology, common understanding and behavioural understanding (Legg, 2014). The role of machines in ensuring standardization and automation is inevitable for ensuring more proactive medicine (Legg, 2014).

#### 3.4.1.1 Implementation of Electronic Medical Record (EMR)

Medical treatment is becoming more and more complex now a days (Hill & Powell, 2009a). In the US medical errors are estimated to kill 98,000 people per year and leads to health care inflation of 5.9% (Hill & Powell, 2009a). A National health information network is considered as the best solution for solving these issues (Hill & Powell, 2009a). It is said that human cognition would not be adequate enough to process all the required information and it is high time that we move to computerized decision making (Hill & Powell, 2009a). Health care industry is spending only 2% of its revenue into IT enhancement and this would hinder the implementation of Electronic Medical records (EMR) which is inevitable for future health care systems (Hill & Powell, 2009a). EMRs are supposed to be helpful in clinical documentation, result management, administrative support and population health reporting (Hill & Powell, 2009a). It helps to lessen the fill time for prescription, gives complete medical lists reduce drug interactions, and drug abuse (Hill & Powell, 2009a). Patient demographics, past medical records, laboratory data etc can be stored in EMR system which can be viewed by Physicians anywhere will help in giving quality treatment and avoid errors (Hill & Powell, 2009a). Quality of care can be improved as clinical monitoring and aggregation of large data which enables screening are also made possible (Hill & Powell, 2009a). Internal process and improvement of quick communication between different specialities as well as hospitals can also be enabled using EMR (Hill & Powell, 2009a).

According to (Hillestad et al., 2005) it is estimated that the adoption of EMR systems would help to save up to $142-371 billion and reduce medical errors and improve health. During the 1990's many industries like telecommunication, securities trading and retail started investing in IT on a large scale (Hillestad et al., 2005). All these industries claimed a productivity growth of 6-8% (Hillestad et al., 2005) . It is assumed that same rate of productivity growth of 8% can be achieved in health care also with substantial investment in IT (Hillestad et al., 2005). At 90% IT adoption, efficiency savings from inpatient and outpatient care are estimated to be about $77billion (Hillestad et al., 2005). EMRs enable lower patient stay, give alerts to physicians on treatment, less time for entry of data and limited usage of drug and radiology imaging (Hillestad et al., 2005). EMR systems also enable disease management process and predict the services in need for a patient. Consistent recording of medical clinical results which are specific to any particular disease help in better clinical result and outcomes (Hillestad et al., 2005).

#### 3.4.1.2 Pay for Performance (P4P programs)

Pay for performance is a strategy in which the doctors are remunerated based on their performance (Mahar.M, 2006). Implementation of EMR is said to be the most efficient way to track and document the way in which a particular treatment is performed and what improvements have been brought According to (Yale & Murphy, 2007) by eliminating ineffective care the health care system could save up to 15% to 25% of the cost spent on various diseases and P4P is the best alternative (Yale & Murphy, 2007). In UK, P4P programs were implemented where 25% of the doctor's income is dependent on their compliance with Quality and Outcomes Framework (Yale & Murphy, 2007). In the US, P4P implementation would require cooperation between different stakeholders. This shows that increased use of IT is an inevitable change in health care to reduce costs and medical errors and enhance quality (Yale & Murphy, 2007) .

#### 3.4.1.3 Automation & Robotics

According to (Cannesson & Rinehart, 2012) how new technologies would impact health care is a major area of interest for the physicians who are going to be in service for the next 30 years. The author claims that very sophisticated innovations are happening in the market regarding technology but the same is absent in the care delivery system. According to (Cutler & McClellan, 2001) advancement in medical technology is going to contribute to the increase in productivity. Early cost-benefit analysis are also curtailing the growth of new innovations and pushing the new products out of market (Cutler & McClellan, 2001). As far as the author

is concerned he claims that the benefits of technological innovation in health care cannot be realized in the short run and most of the benefits and savings can be realized only in the future years. According to (Cutler & McClellan, 2001) due to increased focus on reducing cost, there is threat of negative innovation where too much focus on cost is compromising the quality of the technology. Technological innovation is very important as it has brought in increased longevity and improved quality of life (Cutler & McClellan, 2001).

In 1965 Gordon E. Moore said that with the advancement in technology the number of transistors that can fit into a given space on a circuit board doubles every 2 years (Cannesson & Rinehart, 2012). Health care is also not free from this phenomenon put forward by Moore's law (Cannesson & Rinehart, 2012). There are many factors favouring the introduction of technology especially in the form of automation and standardization in health care most important being medical safety. Human beings are supposed to have limitations with regard to technical, repetitive and standard work (Cannesson & Rinehart, 2012). The loss of vigilance has always been a problem especially in medicine. Technology evolves in three stages: tool, machine and automation (Cannesson & Rinehart, 2012) . Automation is a machine which substitutes human control with an automatic algorithm. Automation need to be widely implemented in health care as far as safety is concerned and the time when physicians are going to be more of supervisors are not far (Cannesson & Rinehart, 2012) . Technological improvement would help to decrease work load with an increase in productivity. When implementation of automation is enhanced, there will be more leisure time for health care practitioners as computers would do the decision making and machines would carry out the tasks on behalf of the practitioners (Cannesson & Rinehart, 2012).

According to Camarillo et al. (2004) the term "robot" was first coined by the play wright Karel Capek in his drama *Rossum's Universal Robots.* The word robot was derived from the Czech word *robota* which meant slave labour. In the play, machines were created so that they would do all the mundane tasks and this would enable the people to pursue their creative interests. There are many areas identified in health care where robotics could be used extensively. Some of the areas identified in the medical field where application of automation and Robotics are seen are:

1. Laboratories: According to Minifie (1989) there are approximately 400 systems already in use. Robots perform tasks such as automated sample preparation, titration and other tedious

tasks. etc. The advantages cited are multi-tasking, reduction in labour cost, works round the clock and can handle tasks prone to contamination (Minifie, 1989).

2. Pharmacy: ROBOTER is a pharmacy assistant robot and can automatically select and deliver daily medications to patients, and also perform computerized labelling, tray delivery, patient profiling inventory control etc. The author argues that the role of the pharmacist would be greatly altered in the future (Minifie, 1989).

3. Nursing: Robotic systems can be used to assist nurses in their daily tasks. According to Qureshi & Syed (2014), there is a well-documented shortage of nurses and direct care workers in the United States and around the world, which is expected to become more severe as the older adult population grows and prepares for retirement. In a study of the effects of high patient-to-nurse ratio, each additional patient per nurse was associated with a 7% increase in patient mortality and 23% increase in nurse burnout. Introducing robots into assisting nurses can thus support the hectic work of the professional and counteract to shortage of nurses. According to Rabbitt, Kazdin, & Scassellati (2015) socially assistive robots are already used in mental healthcare applications are coach, companion and play partner.

4. Other Areas: Robots are also used in teaching medical students and are also used for maintenance as well as other blue collar jobs. They are also used to feed patients pick up telephones and load disk into computers (Minifie, 1989). As per Goeldner et al. (2015) now care robots are very popular and they take care of elderly people and those who are physical and mentally handicapped. Mann et al. (2015) argues in his article that people are living longer and also age related diseases are increasing. The available age related work force is finding it difficult to meet the increasing demands and increasing technology is inevitable to meet this dilemma. According to Wichmann, Okkalioglu, & Korkmaz (2014) research is being done in the field of integrating tele robotics and wireless sensor networks which would be of great use especially in the field of medicine. Robots are also now widely used for the special care of patients with dementia (Mordoch, Osterreicher, Guse, Roger, & Thompson, 2013).

As per Minifie (1989) robots relieve human workers from relatively structured simple jobs and from hostile environments Robots also help to bring down cost as they can replace the service providers in health care as 39-60% of the cost in health care is related to labour.

Robots provide accurate reading reports and enable to utilize the time of workers for decision making skills. As per Camarillo et al. (2004) the author argues that robots enable repeatability, stability and accuracy. They are optimized for particular environment and can manage multiple simultaneous tasks. One another advantage robots have is that, it enables tele presence surgery opening the door towards global healthcare. Tele mentoring is also made possible where the mentor can sit in one corner of the world and teach and instruct a student who is sitting in another part of the world (Doumbouya, Kamsu-Foguem, Kenfack, & Foguem, 2014).

**Conclusion:**

In this chapter the factors leading to higher health care costs in the U.S., Canada and Netherlands have been identified. The cost factors identified are pharmaceutical expenditure, medical technology expenditure, physician expenditure as well as hospital expenditure. The facts and figures pertaining to each cost factor are presented in different sections. This chapter also focusses on the solutions always suggested as a means to reduce the health care cost as well as explanation on how it would help reduce cost. The commonly discussed suggestions are standardization of health care by means of EMR, P4P and introduction of robotics in health care.

# 4. Is U.S. Health Care a Market? – Pharmaceutical & Medical Technology Industries

## Introduction

This chapter addresses the question whether the rising costs of health care in the U.S are due to the attempts to apply the neoclassical model to health care. In order to answer this question we first need to assess whether and to what extent the U.S. health care system does, in fact, resemble a neoclassical model. A health care system typically comprises four 'sub-systems' consisting of physicians, hospitals, the pharmaceutical industry, and the medical technology industry. As argued in Ch. 3, costs have increased in all four 'sub-systems'. Therefore, we examine each of them in turn. In this chapter in sections 4.1 and 4.2 we assess whether, respectively, the pharmaceutical and medical technology industries operate in a *neoclassical* market[5] (as distinguished from a market as such), and if so, whether the neoclassical features of these markets can be held responsible for the rising costs of resp. medicines and medical technology.

## 4.1 Role of pharmaceutical Industry

As already discussed in Section 2.3, medicines are goods which are produced, and then bought and sold; naturally, they need a market, to facilitate this. But the question is whether they need a *neoclassical* market. Focussing on costs, our question is, more specifically: If the policy aim is to reduce the costs of health care, does it help to design the market for medicines as a *neoclassical* market? Do the neoclassical properties of the pharmaceutical market (if any) help to reduce the costs of medicines?

In order to answer this question, we first of all examine the way the pharmaceutical industry is organised in the U.S. We review its salient features in order to assess (a) whether they are neoclassical, and (b) whether they can be held responsible for the high costs of medicine.

[5] Or, as neoclassical economists call it, a *free market*, that is, a market free from intervention (by government, or society) in the form of laws and regulation, except for one right which, according to neoclassical economics, is required for a proper functioning of the free market, namely private property (especially private ownership of capital).

### 4.1.1 Market structure

Neoclassical economics allows for different possible market constellations or 'market structures'. The 'first best' possibility is a market characterised by perfect competition (holding the assumptions such as many participants, perfect knowledge etc.). However, there may be reasons in reality why one or more assumptions of the perfect competition model do not hold. An example is indivisibility of fixed costs, i.e. a violation of the assumption of divisibility, which will lead to economies of scale. In such a case, a deviation of perfect competition model, such as oligopoly or even monopoly, is accepted as an inevitable 'second best' solution (refer section 2.1.3).

Does the pharmaceutical industry in the U.S. resemble a neoclassical perfect competition model? Almost half of the market share of the pharmaceutical industry is in the hands of 10 major players − six from the U.S. and four from different countries in Europe. The market share of the 10 companies as of 2013 is given below:

**Table 2- Market share (pharmaceutical Companies)**

| | |
|---|---|
| Pfizer USA | 5.07% |
| Novartis Switzerland | 5.8% |
| Sanofi France | 4.36% |
| Roche Holding Switzerland | 4.09% |
| Merck & Co USA | 4.16% |
| Glaxo SmithKline UK | 3.72% |
| Astra Zeneca UK | 3.46% |
| Eli Lilly & Co | 2.7% |
| Johnson & Johnson USA | 3.51% |
| Amgen USA (3%) | 3% |

**Source: (Pearson, 2014)**

As a consequence, the assumption that an individual producer or group of producers cannot influence the market price (the assumption of 'absence of market power'; see also Section 2.1.3) is unlikely to hold in the pharmaceutical industry. To assess whether and to what extent the assumption of 'absence of market power' actually holds, let us look at pharmaceutical prices in more detail.

**Price takers or price setters?**

A characteristic of pharmaceutical companies are their high prices (e.g. relative to the prices of generic medicine (refer Ch. 3). The pharmaceutical industry's power to set prices above mere costs of production (as exemplified by producers of generic medicine) is derived from patents (refer section 2.1.7, 2.1.9 & 2.3.9) granted for R&D (discussed below). Pharmaceutical corporations justify the higher prices by referring to the high R&D costs (including the risks associated with uncertain research outcome) that they claim they have. According to PhRMA (Pharmaceutical research and manufacturers of America, R&D investment takes years to become fruitful and most of the research fails as it is a trial and error process (DiMasi, Hansen, Grabowski, & Lasagna, 1991), (Basheer, 2012). In drug industry it takes average 17 years for any research to materialize with clinical trials alone takes 7 years. About $ 2.6 billion (PHRMA, 2015) on average has to be invested per drug and only 1/10000 reach the market approval stage (Mazzucato, 2013) A new drug can reach the market only if it gets the approval of FDA (Food & Drug Administration). According to pharmaceutical companies the success rate of those which can reach the market is only 0.01 percent (Mazzucato, 2013),(PHRMA, 2015). The high prices are said to compensate for research costs and for the risks taken. However, do the pharmaceutical corporations themselves bear these costs? We return to this question below.

### 4.1.2 Patenting and the privatisation of knowledge

The drug companies are compensated for the risk they are taking and the huge investments they are making through the "patent" granted by the government authority (refer section 2.1.7, 2.1.9 & 2.3.9) giving them the sole right over the product by excluding others from making use or selling the product (Siddiqi, 2005), (Vallee & Yildizoglu, 2004). The practice of patenting is based on neoclassical theory which focusses on the agent's incentives (Vallee & Yildizoglu, 2004). It is seen by neoclassical economists as a tool to protect innovation or provide incentives for innovation by giving the innovating firm the sole right over the product. This, in turn, gives the firm market power over the price (Vallee & Yildizoglu, 2004).The patents that are granted to pharmaceutical corporations enable pharmaceutical industries to charge higher prices for their products than they would be able to charge in perfect competition. Patents in pharmaceutical industry remove perfect competition and make the pharmaceutical industry a monopoly (Vallee & Yildizoglu, 2004), (Siddiqi, 2005).This lack of competition is the reason for high cost of drugs.

Oligopoly and monopoly are deviations from the neoclassical perfect competition model but they are deviations that are acknowledged by neoclassical theory (refer section 2.1.3). Patents lead to monopoly enabling the pharmaceutical companies to charge high price for the drugs and thus make high profits, which are said to be necessary to recover R&D costs (Guell & Fischbaum, 1995),(Peterson, 2014), (Muzaka, 2013). Patented drugs contribute over 70% of the total drug sales revenue (Benson, 2015).

Patenting is accepted as welfare-enhancing by neoclassical economics in fields like research (section 2.2.9). It permits industry to turn what neoclassical economics calls a 'public good' (in this case, knowledge) into a private good. A 'public good' is defined as non-exclusive (its benefits are social and people cannot be excluded from using this good) and non-rival (once the good is produced, no extra resources are required to produce it again; the marginal costs of production are zero). The gains of producing a public good cannot be privately appropriated, unless people who do not pay for the good are excluded from using the good (WTO, 2015). In the case of the pharmaceutical industry, a patent excludes potential producers of generic medicine from using the good (knowledge) (refer section 2.1.7, 2.1.9 & 2.3.9).

This leads to a major question. Are the monopolies created by patenting social welfare-enhancing as claimed by neoclassical economists? Or are they only leading to amassing of wealth in the hands of a few companies?

Today, shares in drug companies are among the most profitable stocks. According to Maher, (M. Maher, 2006) this is the result of the liberalisation of the 1980s of which the pharmaceutical industry has taken advantage. In the 1980s, the whole world was convinced that liberalisation of markets (i.e. the design of markets according to neoclassical principles) is the best economic solution and it would ensure social welfare. It was the time when government itself started belittling its power giving way for privatization and deregulation. In addition, it came up with changes in the legal sphere which supported business. For example, beginning 1980, government came up with Bayh-Dole Act (Pub.L.96-157, December 12 1980) which enabled very large pharmaceutical industries to retain exclusive rights over publicly funded research (Colaianni & Cook, 2009),(Mowery, Richard, Sampat, & Ziedons, 2005). This means that even though a research is publicly funded (with tax payers' money), pharmaceutical companies could claim patent of publicly funded research (Colaianni & Cook, 2009),(Mowery et al., 2005). They do not have to invest money for their own research (Colaianni & Cook, 2009),(Mowery et al., 2005). Further, the Hatch-Waxman Act (Pub.L.98-

417, 1884) enabled drug companies to extend their patent (Carrier, 2009) . Another most important regulation that was brought in was the removal of the restriction on 'direct to consumer advertisement' for drug companies in 1980 (Lizuka, 2004), (Dave & Saffer, 2012). Such measures increased the flow of capital towards the balance sheets of pharmaceutical companies (Lizuka, 2004), (Dave & Saffer, 2012).

While pharmaceutical companies claim that they have invested heavily in R&D, evidence shows a different picture. The National Institute of Health (NIH) has invested almost $300 billion over the last decade, ($30.9 billion alone in 2012 which is 75% of the total cost) absorbing the larger part of the costs of drug development (Mazzucato based on National Science Foundation NSF). To better understand how the drug industry works it is very important to know the classification of drugs. Drugs can be mainly classified into two: new molecular entities, and variations on old drugs (Mazzucato, 2013). When, for instance, neoclassical economist Paul Feldstein, (J. P. Feldstein, 2012) justifies the high pharmaceutical prices by saying that they are needed to cover up the R&D costs it is interesting to note that the "innovative new drugs", i.e. the new molecular entities, are all publicly funded (i.e. with tax payers' money (Hoey, 2004). Between 1993 and 2004 FDA approved almost 1072 drugs. Out of these only 146 were priority new molecular entity drugs which is only 14% of the total number of drugs that reached the market (Mazzucato, 2013).

### 4.1.3 Advertising and the symmetry of information

Private firms even though they claim that they invest in R&D, in reality they are just making the "me too drugs". Me too Drugs are new drugs which are a slight variation of the existing drugs (Scherer, 2007), (Krimsky, 2004). Of the drugs that were approved by the FDA and that reached the market, 67% were just 'me-too drugs' (Scherer, 2007), (Krimsky, 2004). This enabled most of the drug companies to even close down their R&D facilities as part of cost cutting as most of the innovations were coming from public labs (Mazzucato, 2013).The demand for 'me-too drugs' is stimulated through heavy advertising (Lizuka, 2004), (Dave & Saffer, 2012) (reminding of what John Kenneth Galbraith called 'want creation', as mentioned in (Section 2.2.6 & refer 2.1.2 & 2.2.2). By 2005, the industry's budget for 'direct to consumer advertisement' reached $4.1 billion from $2.5 billion in 2001. In addition, the industry spent almost $5.5 billion in 2005 on 88,000 sales representatives to persuade doctors to prescribe their drugs in return for favours like free leisure travel and other facilities (M.. Maher, 2006) The marketing skills of pharmaceutical industry has gone to such an extent that

today even inevitable and natural aspects of life such as ageing are also categorized as disease and drugs are made available for its "treatment" (D. Callahan, 2009a).

In sum, pharmaceutical companies are demanding high prices for 'new molecular entities' which they have not developed, as well as for 'me-too drugs' for which research costs are low but on which the industry spends large sums of money for advertising and product promotion (Scherer, 2007), (Krimsky, 2004). In advertising, the pharmaceutical industry appears to take advantage of what neoclassical economics calls 'information asymmetry', (refer sections 2.1.2 & 2.2.2) i.e. a deviation from the neoclassical perfect competition model; without it, the question is whether consumers would be buying the "me too drugs" in such quantities and at such high cost. It is true that we are now living in an age of technology where information symmetry can never be considered as a problem. It is true that internet and advertisements through other means "theoretically" should be providing us with information (ref sections 2.1.2 & 2.2.2). But the question here is whether it is true in health care. We get the information what the companies provide. In countries like the U.S there is no restriction on advertisements especially in health care unlike that in Canada where advertisements are prohibited on safety grounds (Mintzes, 2006). All the medicines that are approved by FDA (the process explained below) could be advertised (Dave & Saffer, 2012). In reality in health care 60% of the advertisements plays on customer's emotions, inducing fears, hopes and anxiety. Less than one percent mention cost and less than 2 percent mention safety (Larson, Schwatz.M.L, Woloshin, & Welsch, 2005).

### 4.1.4 Lobbying: Is lobbying neo classical

In the step from drug development to the market, regulatory authorities like FDA play a crucial role. For the FDA, the drug companies only need to prove that the product in question is no worse than what is already available in the market (M. Maher, 2006). They were successful in persuading the congress to pass the Prescription Drug User Fee Act (PDUFA) in 1992, a law that enabled the drug companies to fund FDA for the speeding up of drug approval process (Philipson & Sun, 2008), (Grabowski & Wang, 2008). As quoted by Maher, finally the agency which was supposed to regulate the pharmaceutical industry became "dependent" of the same agency (M. Maher, 2006).Thus companies are producing "me too drugs" which they can prove are not worse than the already existing ones and with the help of advertisements are able to market them to people at a high cost (Applbaum, 2009) . The relaxation of regulations by FDA and introduction of acts like PDUFA, Bayh-Dole etcetera which is helping the industry was achieved by industry through lobbying and never came free

for them. This raises the question whether lobbying is neo-classical or neo-liberal or not belonging to any particular theory. According to my investigation I found that there are contradicting views on lobbying.

According to (Agerup et al., 2007) in the neo classical framework for business ethics, the goal of the corporation should be to maximize the profit. If there are profit maximizing behaviour that is good for the corporation but bad for the society the problem is with the law of the land and not the corporation. Lobbying if it helps in the maximization of shareholder value and since lobbying is allowed by law it should be done to maximize profit and enhance shareholder value. The obligation of the corporation is only towards the shareholders. But during my research I have also come across certain neo classical economists who argues against lobbying also. According to (Krueger, 1974) and (Bhagwati, 1982) lobbying is a directly unproductive activity from an economic point of view as it is rent seeking and thus reduces welfare of the society even though it possess political legitimacy and value constituting a pluralistic society. This contradicting view on lobbying based on neo classical economics opens it to another debate whether lobbying is part of neo classical or not? Anyways in reality lobbying is used by corporations to turn around regulations to support their profit making motives and curtail competition as always it is the large corporations with large market share and market capitalization which wins and even removes smaller corporations out of the picture thus preventing perfect corporation and larger corporations growing into mega corporations (Hall, 2014). On one hand lobbying is leading to profit maximization but on the other hands it prevents perfect competition leading to monopoly or oligopoly.

Even though there is debate on whether lobbying is based on neo classical economics or not, the profits that patents are allowing pharmaceutical companies to make are used by them mainly to engage in activities such as advertising and lobbying for changes in laws and regulation that will permit them to make further profit. Regarding advertising, a question is whether it alters the feelings and thoughts people have about health care – e.g. by creating wants and by giving one-sided information − in ways that make patients and doctors resemble more the restless utilitarian human being who is never satisfied. According to the neoclassical perfect competition model, there is no information asymmetry and suppliers know what the consumers want and vice versa (sections 2.1.2 & 2.2.2). Whether reality is as symmetric as this is a question that would require further investigation.

### 4.1.5 Maximisation of shareholder value

From the point of view of neoclassical theory, the super-normal profits made by pharmaceutical companies thanks to patenting, are justified to the extent that they are invested in research & development or accumulation of machines and tools and factory buildings (permitting rejuvenation of the capital stock and/or further economic growth) (ref sections 2.1.8 & 2.2.8). But the question is whether pharmaceutical profits are used like this in reality. In addition to advertising and lobbying, the profits made by the pharmaceutical companies are also used by them to buy back their own shares instead of investing for research (Lazonick, 2014). For example, in 2011 Pfizer repurchased $9 million in stock which was 90% of its net income and 99% of R&D expenditure (Lazonick & O, 2011).

When we are focused on our self-interest, as neoclassical theory recommends, our only motive will be to maximize our wealth in the best possible way. In a stock-based economy such as the U.S. economy, this neoclassical maxim is easily translated into 'maximisation of shareholder value' (MSV). But is MSV truly a neoclassical principle? (refer sections 2.1.8 & 2.3.8). Buying back of shares would help to shoot the market price of the shares instantly which would increase the asset value of the holder of the shares. But does this translate into efficiency in capital allocation furthering economic growth? Are neoclassical concepts of capital and maximisation, originally designed for a largely agrarian society that had just started to industrialise and intended for dealing with *physical* capital, fit for dealing with modern stock-based industry and a financial world as we know it today? Thus, to what extent MSV is a neoclassical principle is open to debate (refer sections 2.1.8 & 2.3.8). The question for our purposes is whether the principle of MSV, designed for stock-based industrial production and finance, is seamlessly transferable to the sphere of health. Can MSV promote health as much as it promotes wealth?

### 4.1.6 The consumer in the medicine market

In its defence of the 'free market', neoclassical economics advocates a separation of the sphere of economics and the sphere of rights. Government, or society in general, should not interfere in economic life through laws and regulation, with just one exception: recognition by law of private property rights, especially private ownership of capital. On the basis of this view – that the economy works better without intervention from the political-legal sphere − much deregulation, privatisation and so-called 'flexibilisation' has taken place especially since 1980. However, perhaps paradoxically, this has not led to an across-the-board reduction

of interference of law and regulation with economic life. In particular, knowledge has been privatised and is increasingly protected by patents (refer sections 2.1.7, 2.1.9 & 2.3.9).

Privatisation of knowledge as it happens today involves a shift of knowledge generation away from the public sphere – where it is (to varying degrees in different countries) protected by constitutional rights (such as freedom of thought) and academic freedom − to the sphere of commerce. This has implications for the kind of knowledge that is developed. Under the pressure of (neoclassical) profit-maximisation or its modern version, the now widely acknowledged principle of 'maximisation of shareholder value' (MSV), only that knowledge will be developed which maximises shareholder value (refer section 2.3.8).

For example, there is a huge demand for drugs for malaria as millions of people are dying in Africa due to non-availability of drugs. In the twenty year period between (1984) and (2004) almost 40 million people are estimated to have died from malaria. No pharmaceutical company is interested in investing money for the research & development of malaria as it would involve many years and high cost also. In fact Africa is a third world country and people in Africa cannot afford the cost of the high drug prices.

As another example, about 1500 people in Botswana are infected every day with AIDS according to WHO estimate. The drugs that is available for AIDS treatment is estimated to cost $15000 per annum where the annual income of the people is estimated to be $330. AIDS is also very prevalent in the rich affluent part of the world like Europe and America. It is remarkable that the overwhelming majority of research on AIDS is concentrated to cure the particular strain of AIDS that is affecting the affluent minority in these regions rather than the E-strain found in African countries.

In neoclassical economics, lack of access to goods is defended on meritocratic grounds (refer section 2.3.10). On neoclassical assumptions, one's income reflects one's marginal productivity, and this determines one's eligibility to buy a good (see Section 2.3.10). However, this raises some questions. Is meritocracy justifiable as the principle to govern access to medicine? And is utilitarian choice applicable to matters of health? The decision to buy a luxury good can be treated as a matter of choice and if one's budget denies one a car, one may substitute a bus for a car and still be able to get from one place to another; but is health a good, subject to utility maximisation and a budget constraint, or a right?

### 4.1.7 Intellectual property

As explained above, commercialisation of knowledge (refer section 2.1.7, 2.1.9 & 2.3.9) may not even allow for the possibility of utilitarian choice, since knowledge (medicines) that do not generate financial returns will not be created. Such questions regarding the commercialisation of knowledge in the end relate to the particular division of tasks between the economic and the political-legal sphere proposed by neoclassical theory.

Is it right to – by subjecting it to profit-maximisation − concentrate research & development on diseases affecting the rich people as mentioned above in the case of AIDS? Indeed, what has remained of the original 'free market' idea that the economy, when left to itself, will generate the best possible social outcome? Why is business increasingly supported by changes in the political-legal sphere, while interference in the economy by political-legal institutions is otherwise so forcefully rejected by neoclassical theory?

By rejecting interference by the legal-political sphere, neoclassical theory (perhaps more implicitly than explicitly) acknowledges the existence of two spheres of social life: the economy and the political-legal sphere. But where does the creation of knowledge belong? Does it belong to economic life, as advocated by proponents of intellectual property? Is it socially optimal to turn knowledge into a good that can be privately owned as 'intellectual property'? Or does this lead to market power, high prices and exclusion of individuals from access to essential goods?

Not all neoclassical economists support intellectual property. According to (Boldrin, Michele, and David K. Levine. 2013) empirical evidence show that patents are not leading to increase in innovation or productivity which is the very purpose of patents. They strongly believe that patents should be abolished and a new system should be found out that does not give rise to lobbying and rent seeking activities as patents do.

And how does the legal-political sphere itself relate to knowledge? Does the existence of constitutional rights such as freedom of thought (which arguably includes the right to develop medicines free from compulsion by economic motives) show that knowledge is a separate sphere, that is, independent of demands coming from the economy as well as from the sphere of government and politics?

If access to health care and medicine is a right of every human being, should research & development which is leading to development of medicine be placed within the boundaries of the economy, or should it be removed from these realms and considered as a separate sphere

by itself? Do lower costs of medicine, in the end, require the recognition of a third sphere (besides the economic sphere and the sphere of rights), namely a sphere of knowledge or culture, which would include science, education, and the free development of health care and medicine? Such questions will be discussed further in Chapter 7. In the next section the role of medical technology would be discussed.

### 4.2 Role of Medical Technology

Advance in medical technology has revolutionized health care all over the world. But unlike in other industries medical technology is not making health care cheaper and better (Skinner, 2013). Like any other good produced medical technology also require a market which enables the buying and selling of medical devices (ref section 2.3) like medicines. The major focus here is whether it should be a neoclassical market as explained in chapter two. We have already seen that medical technology cost is increasing over the years (ref chapter 3). So the question that we need to analyze is that whether a policy decision to design the market as a neoclassical market would help achieve the goal of bringing down medical technology cost?

For medical device industry we are taking into consideration the medical device industry in the U.S. We review in detail a) the functioning of the medical device industry to see whether it is neoclassical and b) whether it can be held responsible for the rising cost.

In the U.S. Medical technology industry as well as the pharmaceutical industry function in the same way. Unlike pharmaceutical industry there are not many articles written on the medical technology industry exclusively for the reason that it is comparatively new.

#### 4.2.1 Market Structure

The first question here is whether the medical device industry resemble a neo classical perfect competition model? Like in pharmaceutical industry in medical device industry almost half of the market share is with ten companies of which four are European companies and six are from the U.S. The major companies and their market shares are given below:

**Table 3-Market Share (Medical Technology Companies)**

| | |
|---|---|
| Johnson & Johnson (USA) | 9% |
| Baxter International (USA) | 4% |
| Covidien (Ireland) | 3% |
| Siemens (Germany) | 6% |
| Philips (Netherlands) | 4% |
| Becton Dickinson (USA) | 2% |
| GE Health Care (USA) | 6% |
| Abott Laboratories (USA) | 3% |
| Medtronics (Ireland) | 5% |
| Boston Scientific (USA) | 3% |

**Source: (Schorre.C., 2013)**

As in pharmaceutical industry the medical technology industry is also not characterized by many players. The neo classical perfect competition assumption that an individual or group of players cannot influence the market price is unlikely to hold in medical device industry also (refer section 2.1.3).

**Price Takers or Price Setters?**

The cost of medical devices are increasing exorbitantly over the years (refer chapter 3). Like pharmaceutical companies medical device companies also set high price for their products. This is enabled by patents (refer sections 2.1.7, 2.1.9 & 2.3.9) which the device companies as well as pharmaceutical companies argue that is inevitable for stimulating R&D leading to new product that help improve health and the financial return on their investment acts as an incentive for future research (Gold, Kaplan, Orbinski, Harland-Logan, & N-Marandi.S., 2010), (World Trade organization, 2015). Medical device companies claim that it would take at least ten years for the radical innovations to materialize and at least three years for the incremental devices (Makower, Meer, & Denend, November 2010). According to a market survey conducted among medical device companies in U.S. revealed that approximately $31 million had to be spent for incremental devices to reach the market and more than $ 94 million was spent for a radical device to reach the market (Makower et al., November 2010) . The companies also claim that to sustain themselves in a venture backed industry these mounting costs is a big hurdle. Only four out of ten devices is considered successful (Makower et al., November 2010).

As in pharmaceutical industry the high prices from patenting would help them compensate for their costs which they claim to incur due to research & development. Whether the actual costs are borne by the medical device industry can be investigated when we look into how the industry is working?

### 4.2.2 Patenting and the privatization of knowledge

Like in pharmaceutical industry, in device industry also patenting leads to monopoly enabling the device companies to charge higher prices and make huge profits (refer sections 2.1.3, 2.1.7, 2,1,9 & 2.3.9). As mentioned in pharmaceutical industry the major question here is whether monopolies created by patenting is welfare enhancing as claimed by neo classical economists? Like the pharmaceutical industry the stock of device companies is also liked by people to poses as it is very profitable (D. Callahan, 2009bP. 48).

It is not only the drug industries which benefited from the 1980's liberalization policy. The Bayh-Dole Act (Pub.L.96-157, December 12 1980) was not only beneficial for the pharmaceutical industry but also for the device industry. Bayh-Dole Act enabled the transfer of ownership of intellectual property developed with federal funding to the private sector. For the medical technology industry, they got access to promising ideas which they could convert to products (Henderson & Smith, 2006). Another act which helped the medical device industry was the removal of the restriction of "direct to consumer advertisement" for the device industry in 1980. It is not only the pharmaceutical industry which has benefited from the investments made by National Institute of Health (NIH) but also the device industry. Unlike the pharmaceutical industry the actual data on how much money was specifically spent for medical device development is not available. When the device companies claim that they invested heavily in R&D, evidence show that only 0.5% of the devices that reach the market give better value than their older version (B. Robert & Stuart, 2010), (Skinner, 2013). Like the pharmaceutical companies the device companies only need to prove that their devices are not worse than the already existing ones (D. Callahan, 2009a), (M.. Maher, 2006). This means that medical device industry is duplicating the already existing technology and selling it in the market at a very high price. Like 'me too drugs', 'me too devices' are flooding the market. According to Sylvia Kremer, based on an interview given by Arthur S. Relman, former editor of The New England Journal of Medicine and professor emeritus Harvard Medical School) the whole of medical education system and medical profession has been organized in such a way that physicians learn about the devices and drugs to be used mainly from the professors and education programs sponsored by the device as well as the

pharmaceutical companies. Medical schools accept grants from the industries and they are even involved with the preparation of the syllabus also (LO & Marilyn, 2009).This has developed due to an unholy relationship which exists between the industry and the educational institutions (LO & Marilyn, 2009). According to (LO & Marilyn, 2009) members of U.S. congress has also expressed their concern over the commercial relationship existing between the industry and the institutions and it is cited in the report of finance Committee, U.S, senate (2007) (LO & Marilyn, 2009). The medical device industry also took advantage of the competition existing between the hospitals trying to gain their market share (M.. Maher, 2006). How it worked in reality would be explained in the next chapter on the role of hospitals and physicians.

### 4.2.3 Advertising & Symmetry of Information

As already mentioned, of all the devices that reached the market only 0.5% give better value than the older ones (B. Robert & Stuart, 2010), (Skinner, 2013). Like 'me too drugs' the demand for 'me too devices' is also stimulated through advertisements which points our finger to the 'want creation' mentioned by John Kenneth Galbraith in (section 2.2.6). According to Maggie Maher 60% of the advertisements plays on customer's emotions, inducing fears, hopes and anxiety. Less than one percent mention cost and less than 2 percent mention safety. She has come up with these numbers based on a paper on the investigation done on advertisements by various sectors of health care by the (American Medical Association) (Larson, Schwatz.M.L., Woloshin, & Welsch, 2005). In advertisements even screening techniques like MRI's are projected in such a way that it induces fear and anxiety in the minds of the people (Larson et al., 2005). Even healthy people would feel like demanding tests to make sure that they are healthy (Larson et al., 2005). For those people who are already sick new devices and drugs give them hope (Larson et al., 2005). Even though there is no chance of survival other than prolonging life for some more time we demand for more medication which only helps us incur more cost but no other benefits (Larson et al., 2005). The medical device industry has spent almost 14.6 billion dollars for marketing activities alone in 2012 which includes even persuading doctors to use more of their devices in return for favors for free leisure travel and other facilities (Statista, 2014). So according to (CanadianInstituteofHealthInformation, 2014; Larson et al., 2005) the medical device industry through advertisements are inducing fear and anxiety in the minds of the people making them demand for more medical care and on the other hand persuading doctors

and hospitals to use it on the patients. This is further explained in section 4.3 when the role of doctors and hospitals is explained.

### 4.2.4 Lobbying: Is it neoclassical

Like in pharmaceutical industry FDA plays a major role in device industry also in terms of approval for the devices to reach the market. As already mentioned the device companies just need to prove that the technology in question is not worse than the already existing one (M.. Maher, 2006).Ten years after the PDUMA was passed for pharmaceutical industry, MDUFMA (Medical Device User Fee and Modernization Act 2002) was passed. The new act supports the device industry, because it enables the device industry to pay the FDA for the speedy approval of their products Callahan, MM (based on a book written by Lewis Avron-Powerful Medicines He is a professor of Medicine at Harvard University on powerful medicine) page 93. The regulators who were supposed to regulate the device industry became their dependents. Thus it became relatively easy for companies to produce "me too devices", to prove they are not worse than the already existing ones, and with the help of advertisements to market them to people at a high price (M.Maher, 2006), (Callahan,2009). The relaxation of regulations by FDA and introduction of acts like was achieved by industry through lobbying. For a discussion of contradicting views on lobbying (whether it is acceptable from the point of view of neoclassical economics), see Section 4.1.5.

### 4.2.5 Maximization of Shareholder Value

There are no indications to show that medical device industry like the pharmaceutical industry is involved in buy back of shares to boost their profit. But they also have obligation towards their shareholders and pay dividends every quarter. Usually (as mentioned in section 4.2.2) a medical device would take more than ten years to reach market. This delay does not go hand in hand with the profit maximization motive of the companies. As we have seen, in order to maximize profit, companies are making 'me too devices' (as they only need to prove that the new device is not worse than the already existing one as per FDA regulation) and through advertisements invoking want and anxiety (refer section 4.2.4, section 2.2.1 and 2.2.2) in the minds of the people on one hand and at the same time luring doctors with offers (refer section 4.2.4) to use them. As quoted by Daniel Callahan, year p.128 points out "it is in the interest of a market- driven medical system to make you think you are sick or soon will be or make you worry over the possibility" (Bartlett and Steele, Critical Condition 92).

It is very interesting to note that in other OECD countries like Canada 'direct to consumer advertisements' are not allowed by law due to safety concerns (B. Mintzes, 2006). In Canada all the advertising materials as well as information directed towards the health care professionals have to get preclearance from the pharmaceutical Advertising Advisory Board (PAAB) 13 (B. Mintzes, 2006). However in America device manufacturers and pharmaceutical companies are allowed to advertise directly to the people. Since the people are already aware of the devices the hospitals are also forced to buy and use them (explained in the next section). Thus 'direct to consumer advertisement' helps the industry to become profit maximizers (making me too devices and selling them at high price) and consumers to become utility maximizers (who demand more since they are anxious or worried) like the neoclassical consumers who is never satisfied (ref section 2.1.6 and 2.2.6). As mentioned in section 4.1.6 whether maximization of shareholder value is neoclassical is open to debate. But the question here is when MSV is transferred to health whether it is promoting health or not?

### 4.2.6 The consumer in the medical technology market

Due to the increasing cost of medical technology due to patenting, high use per patient (stimulated through advertisements) the health care expenditure is becoming unaffordable for the people. This leads to the same question as in the case of pharmaceutical industry regarding meritocracy (2.2.10 & 2.3.10). Should one's income reflect one's eligibility for treatment? Can health be denied based on one's income? Is health care a right of every person? Is research based on which development of technology happens be placed within the boundaries of economy? Should it be considered as a separate sphere in itself? Such questions will be discussed in chapter 7.

**Conclusion**

In this chapter I investigated the claim that opening up health care to the market helps to reduce the costs and increase the quality of health care. We distinguished, the costs of medical products (medicines and medical devices) which are the two major cost drivers as indicated in chapter 3.

Being products, medicines and medical devices are naturally traded in markets; therefore, the question regarding medical products was not whether costs can be reduced by introducing a market but, more specifically, whether designing the market for medicines according to neoclassical principles would help reduce the costs of medical products. Introducing neoclassical features such as competition and profit maximisation raises a number of problems. For instance, who will develop medical knowledge (required for medicines and medical technology) in this context? The neoclassical solution is patenting which, however, leads to market power, which raises prices and hence the costs of health care. Obviously, the question regarding costs would be whether the neoclassical solution to developing medical knowledge (through patenting) leads to higher costs and prices. Regarding quality, we found that commercial development of medical knowledge tends to neglect the development of medical products for patients who cannot back up their medical needs with sufficient purchasing power.

Another problem is information asymmetry. According to neoclassical economists, information on the internet reduces the information disadvantage of patients. However, critics argue that such information often consists of advertisements which give limited information and are geared towards inducing patients to demand expensive medical products, which raises the costs of health care. However, these rising costs are also supported by the 'soft budget constraint' created by the insurance system in place, a system that, perhaps, would not be defendable from a neoclassical perspective. The insurance system keeps demand for medical products (and therefore prices) at a higher level than would be the case without it. We return to this issue in chapter 6.

A third problem is lobbying, which adds to market power therefore to higher prices. The question is whether lobbying is a neoclassical feature; is it defendable from a neoclassical point of view? In a neoclassical market, the state, or regulation, would be minimal, so there would be little reason for lobbying to take place. However, within a 'maximisation of shareholder value' (MSV) framework, lobbying would be acceptable as part of competition to increase shareholder value.

# 5. Is U.S. Health Care a Market? – Health care services (Physician & Hospital Services)

## Introduction

In chapter 4, we assessed whether the pharmaceutical as well as medical technology industries operate in a neoclassical market and if so whether the neo classical features are responsible for the rising cost. In this chapter, where we investigate, respectively, hospitals and physicians, the question is different. Here, the question is whether the activities of physicians and hospitals in relation to their patients can at all be conceptualised as a market – whether neoclassical or otherwise. Is the care provided by physicians, and needed by patients, a good that can or should be traded just like real commodities such as vegetables or cars?

## 5.1 Role of Hospitals & Physicians

When investigating hospitals and physicians, the main question that we need to look into would be as already mentioned, is different from that governing the pharmaceutical and medical technology industry where drugs and devices are goods which require a market which facilitate its buying and selling. When it comes to hospitals and physicians the main question would be whether hospitals and physician service with their relation to their patients can be conceptualized as a market? To be more specific, can the care provided by the hospitals and physicians ever be traded as a good like vegetables or cars? In order to answer this question we investigate the functioning of the hospitals and physicians.

### 5.1.1 The history of the American Healthcare System

I would like to start the discussion by first explaining briefly the history of the American Health care system. This historical perspective would give an idea on how health care was perceived in the beginning of the century and how it has evolved over the time.

In the beginning of the 20$^{th}$ century hospitals were a place of charity, providing care for the sick as well as for the poor people (T. R. Williams, 2008) . In those days hospitals were considered as the responsibility of the particular community it belonged to and therefore all the infrastructure needed was provided by the community itself (T. R. Williams, 2008). Hospitals were considered as a place where the patients could come and meet the doctors and get their sickness treated (T. R. Williams, 2008). Since most of the patients were poor the doctors could not rely solely on fees to manage their practice (T. R. Williams, 2008). The patients even brought in chicken and baklava to the doctors as fees which were accepted by the doctors also (T. R. Williams, 2008). Things started changing with the great depression of

the 1930's (Mahar, 2006), (T. R. Williams, 2008) . Unemployment soared and it became unaffordable for anyone to pay the bills. By 1932 the American Medical Association (AMA) warned that hospitals were on the verge of a breakdown (Mahar, 2006), (T. R. Williams, 2008). That year AMA approved for an insurance system as a solution for the crisis (Mahar, 2006). Thus great depression gave way for the first not-for-profit insurer (Mahar, 2006), (T. R. Williams, 2008). The first insurance came from a group of Dallas teachers who approached a hospital with the idea of establishing a 'sick benefit fund' that would provide 21 days of hospitalization for a premium of $6 (Mahar, 2006), (T. R. Williams, 2008) . In 1937 this grew into Blue Cross, the first not-for-profit insurance plan (Mahar, 2006), (T. R. Williams, 2008) . The success of not-for-profit insurance was an eye opener for considering health care insurance as a profit making business venture (Mahar, 2006), (T. R. Williams, 2008). Blue Cross which was the first not-for profit insurance thus paved the way for private insurance companies into the health business (Mahar, 2006), (T. R. Williams, 2008). After world war 11, because of high inflation government imposed wage and price control. Government imposed compulsory employer-based insurance policy as a fringe benefit which also fetched tax benefits for the employer to attract employees in a wage controlled environment (Mahar, 2006), (T. R. Williams, 2008). By 1965 almost two- third, (more than 70%) of the people were insured (Mahar, 2006), (T. R. Williams, 2008). This created a 'soft budget constraint' on the part of consumers, opening up possibilities of an endless stream of revenues from 'selling health care' (Mahar, 2006). This was an eye-opener for entrepreneurs who then began to consider 'hospital businesses as a money-making lucrative proposition (Mahar, 2006), (T. R. Williams, 2008). In 1968, a father and son team of surgeons, Dr. Thomas Frist Sr. and Dr. Thomas Frist Jr., joined forces with Jack Massey, the promoter of Kentucky Fried Chicken, and paved the way for the first for-profit private hospital in the U.S (Mahar, 2006), (T. R. Williams, 2008). The next year they made the hospital a public entity by selling the shares to the public. According to Paul Starr, the hospital 'industry' grew faster than computers with many new players coming in and new hospitals mushrooming all around the U.S. during the 70's and especially 80's when privatization and deregulation were considered as the order of the day as it allegedly would ensure competition and bring down cost. (Starr, 1982). As mentioned above, the 'soft budget constraint' on the part of consumers created by the insurance system made investors and shareholders to consider health care as a product that they could sell at a high price in the 'hospital market'. From then onwards, hospitals started to be run by managers or corporate executives with a strong influence in all decision making through centralised management (Starr, 1982).

In the next section we would investigate whether health care could be considered as a product that could be sold in the market or more specifically whether physician/hospital service could be conceptualized as a market.

### 5.1.2 Rationality

When a hospital is publicly listed, hospital management is tuned towards maximization of shareholder value. The question here is to what extent profit maximization or its modern version of MSV (section 2.3.10) can enhance social welfare in terms of health. Does profit maximization rationality go with the rationality of health care providers which is the Hippocratic Oath (as mentioned in Section 2.2.1)?

To understand this first we have to know whether and if so, how healthcare is different from other products. We come back with conclusions *(regarding rationality).*

### 5.1.3 No price competition

According to (Bhattacharya, Hyde, & TU, 2014) hospitals today compete for customers like commercial businesses in a market. But hospitals do not work exactly like the competition explained in the neoclassical model (Bhattacharya et al., 2014). Usually in a perfect competitive market if a single seller is trying to sell a product at a price higher than other sellers he would be pushed out of the market (Bhattacharya et al., 2014). But in health care this is not the case in reality (Bhattacharya et al., 2014). Suppose that a hospital *A* is charging $ 10,000 for a hip transplantation surgery. Hospital B which is greedy is charging $11000. In a perfectly competitive market hospital *B* would lose patients and be forced to close down. But in reality this does not happen. Patients take other factors into consideration such as their long term relationship with the hospital. They also would stay if they feel that the hip transplantation at hospital *B* is superior to the first. If hospital *B* is located at a shorter distance patients would be reluctant to shift also.

### 5.1.4 Differentiated products

The services offered by two hospitals can never be identical, meaning they are not perfect substitute (unlike as mentioned in section 2.2.5) for each other (Bhattacharya et al., 2014). They appear to be same, with same kind of facilities and labs facilities (Bhattacharya et al., 2014). But the quality always varies. For example, the type of care a heart attack victim receives in the emergency room depends on whether the hospital is equipped with a catheterization lab (Bhattacharya et al., 2014). Even if two hospitals have the same catheterization lab quality of the service may differ depending on the experience of the staff

(Bhattacharya et al., 2014). The service offered by a 20 year experienced doctor would be different from that offered by a 5 year experienced doctor (Bhattacharya et al., 2014). Even if the quality is assumed to be exactly similar patients may choose their doctors and patients depending on the loyalty they have towards the concerned practitioners (Bhattacharya et al., 2014).

### 5.1.5 Competition on quality

Usually in a perfect competition market suppliers attempt to attract customers by offering products at a lower cost. As mentioned above hospitals do not compete on price (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999) . Even if one hospital is offering a service at a higher price they will not lose their market share as in hospitals consumers take into consideration other things (mentioned above) like, loyalty, distance, facilities, experience of the staff before they think about shifting to another hospital with regard to price. So hospitals do not compete on price but on quality. Quality is a broader term and, in addition to the quality of doctors, an important role is played by the medical technologies. Competition even extends to the comfort of hospital beds and mosaic floors (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999). However, most critically, when there is competition among the hospitals for the same set of patients the most common area where they compete is on medical technology (refer sections 2.1.4, 2.2.4). (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999). Thus, in order to compete with each other and retain their 'market share', hospitals enter into a 'medical arms race' (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999), (C. J. Robinson & Luft, 1985),(Culyer & Newhouse, 2005).

### 5.1.6 Competition leads to duplication

Hospitals compete on quality by competing on the best medical technologies available to attract patients (Cochran et al., 2011), (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999), (M.. Maher, 2006), (D. Callahan, 2009a). When a competitor acquires a modern technology you are also forced to acquire it to show your competency (Cochran et al., 2011), (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999), But what ultimately happens is that hospitals in the same area end up with duplication of the same technology(Cochran et al., 2011), (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999), (M.. Maher, 2006). According to (Cochran et al., 2011), (Bhattacharya et al., 2014), (K Patel & Rushefsky, 1999), (M.. Maher, 2006) status competition among hospitals lead to duplication of medical technology. Helicopter ambulances, open-heart surgery units and chemotherapy units are considered high-prestige facilities and often leads to duplication of technology in hospitals in

the same area irrespective of actual need (Cochran et al., 2011). As hospitals in the same area are competing with each other they cannot share their facilities but in fact acquire more and try to compete on quality. Their aim is to acquire as many targets [patients] as possible and make maximum profit out of it. They attracted patients by competing on technology. So competition never allowed hospitals to work together by sharing the facilities and made duplication inevitable leading to health care inflation (M.. Maher, 2006).

### 5.1.7 Competition leads to overconsumption of health care

When you have invested on very expensive devices there will be overconsumption of medical technology even leading to unnecessary treatment of patients (refer sections 2.1.4, 2.2.4). (Bhattacharya et al., 2014). Empirical evidence of how hospitals compete showed a positive relationship between competition and a 'medical arms race' (C. J. Robinson & Luft, 1985),(Culyer & Newhouse, 2005) A hospital in a highly competitive area invests more in medical resources. Expenditure per patient also is higher in these kinds of hospitals. (Bhattacharya et al., 2014), (C. J. Robinson & Luft, 1985),(Culyer & Newhouse, 2005), (K Patel & Rushefsky, 1999), (Cochran et al., 2011).

The results of the 'medical arms race' become visible in a rising use of technology per patient (refer sections 2.1.4, 2.2.4). According to (K. Patel & Rushefsky, 2014) patients in 2007 underwent 3.4 times more CT scans than those in 1998. Another study was conducted by (Smith-Bindman, 2012) on the adverse effects of CT scan on people. For this purpose she tracked almost 2 million patients enrolled in 6 large hospitals between 1996-2010 (Smith-Bindman, 2012), (K. Patel & Rushefsky, 2014). The number of Magnetic Resonance Imaging increased 4 times during this period (Smith-Bindman, 2012), (K. Patel & Rushefsky, 2014). The number of Computer Tomography scans increased 3 times. The number of Positron Emission Tomography showed an increase of 57% during this time period.(Smith-Bindman, 2012), (K. Patel & Rushefsky, 2014). It is estimated that in the U.S. one third of the health care dollars are spent on medical services that do nothing to improve the health but due to the excessive use of technology (Fund, 2013) .

### 5.1.8 Overconsumption due to fee for service remuneration system

According to (Rau, 2014) a survey was commissioned by the ABIM Foundation (American Board of Internal Medicine), an organization of internal medicine doctors in the U.S in 2014. The study reveals that 3 out of 4 doctors say that unnecessary procedures are done by them on the patients. 48% of the doctors just order the test since it gives them incentives due to

fee-for service system that exists which means, more services means more remuneration (Rau, 2014). Almost $750 billion – 30% of the health spending was wasted or unnecessary services according to the ABIM foundation survey. (Haelle, 2013). (Gawandae, 2015) mentions a study conducted on more than one million Medicare patients which revealed that almost 40% had received tests which had no benefits or which were also harmful (Gawandae, 2015). This included, for example, EEGs for a headache (usually EEG's are for seizures, strokes etc), CT and MRI scans for patients who did not suffer from neurological problems, or even putting a cardiac stent for patients with stable cardiac diseases (Gawandae, 2015). According to (Sethi & Viasha, 2014) the share of total abdominal aortic aneurysm repairs (AAA) performed by endovascular aneurysm repair (EVAR) increased rapidly from 32 per cent of the total tests in 2001 to 655 percent in 2006 with considerable variation between states. Competitive hospitals are early adopters of medical technology and this adds to excessive treatments (Sethi & Viasha, 2014). In the U.S. people undergo five times more angioplasties and five times more bypass surgeries than in other developed countries not because the Americans are sicker; according to (Gawandae, 2015) the difference concerns mostly unnecessary treatments. One of the major reasons cited for the overconsumption of health care is the fee-for-service which focuses on volume of services (Varkey, 2010), (Capretta, 2013), (Rau, 2014),(Kerr & Ayanian, 2014). For this it would be possible to blame the doctors. However, as already mentioned, due to the introduction of commercial elements in health care, hospitals compete on medical technology (Bhattacharya et al., 2014), (Culyer & Newhouse, 2005), (K Patel & Rushefsky, 1999), (Cochran et al., 2011) which is pushed on people through doctors leading to overconsumption of health services. This increase in services under the fee-for-service arrangement means more remuneration for the hospitals as well as for the doctors. (Varkey, 2010), (Capretta, 2013), (Rau, 2014), (Kerr & Ayanian, 2014).

### 5.1.9 Competition leads to rationing

The biggest criticism that the health care lobby brought in during the Clinton administration when there was a move to bring in a Canadian kind of government-regulated medical system was the rationing of services. The market proponents claim that 'socialized medicine' like that in Canada would lead to rationing of services and thus non-availability of services. However, evidence shows that competition, too, does not ensure service for all.

In reality, the emergency rooms of hospitals act as the screening area for admitting a patient in the U.S. The patients are not treated depending on their health conditions but based on

their capacity to pay and their insurance (refer section 2.3.10). The government has brought in a regulation called EMTALA (Emergency Medical Treatment & Labour Act) which prevents hospitals from rejecting a patient and requires them to give treatment regardless of his financial and insurance status (M. Maher, 2006). Even after EMTALA became a legal obligation for the hospitals, a study published by the Health Care financing Administration (HCFA) says that almost 549 violations of EMTALA were 'reported' 10 years after the enactment of EMTALA (D. L. Weiss & Martinez, 1999).

For a patient whose surgery is decided, in advance they are informed of their charges. The operation would be carried out only based on the financial credibility of the patient however worse the condition of the patient is. A private investor starts a hospital not for charity but to make profit and enhance shareholder value (refer sections 2.1.8, 2.3.8 & also 2.1.8 & 2.3.8). In that case, the used to treat a patient becomes his financial credibility but not his health and welfare (M. Maher, 2006).

Evidence suggests, moreover, that most of the hospitals are concentrated in metropolitan cities where the number of insured people is higher. According to the U.S. Department of Justice and the Federal Trade Commission which is responsible for maintaining competition in market says that if the HHI **[Herfindahl-Hirschman Index – It is a measure of market concentration. It is calculated by squaring the market share of each firm competing in a market and then summing the resulting number]** is greater than 0.18, then the market is concentrated and if it's greater than 0.25 then the markets are highly concentrated. By this measure the hospitals in U.S. are not very competitive since there is high concentration of hospitals around 0.33 in metropolitan areas as of 2006 (Bhattacharya et al., 2014). According to (Capps & Dranove, 2011) In 2009, the hospitals were highly concentrated in over 80% of the 335 metropolitan areas (Capps & Dranove, 2011).

### 5.1.10 Consolidation leads to higher cost in healthcare

Theoretically consolidation is supposed to reduce the cost in doing business as it would capitalize on economies of scale and minimize duplication especially in health care. 700 mergers occurred between hospitals during the time period of 1996-2000 (MM). But this did not give rise to reduction in cost. Economies of scale can be achieved only if two hospitals fold into one. In the U.S. hospitals consolidation lead to further duplication. Instead of closing down two similar departments as part of merger, they remained open and worked as two separate entities (refer sections 2.1.4, 2.2.4) (Dranove.D & Lindrooth.R, 2003), (Capps &

Dranove, 2004). (Capps & Dranove, 2004) used multivariate regression analysis to study the actual effect of consolidation on the actual prices. They found out that consolidation has only led to increase in price as consolidation led to formation of hospital 'systems' where two or more hospitals in the common area consolidate but function as separate facilities (Dranove.D & Lindrooth.R, 2003), (Capps & Dranove, 2004).

Moreover evidence suggest that most of the hospitals are concentrated in metropolitan cities (refer 2.1.3 & 2.2.3) where the number of insured people are more. According to U.S. Department of Justice and the Federal trade Commission which is responsible for maintaining competition in market says that if the HHI is greater than 0.18, then the market is concentrated and if it's greater than 0.25 then the markets are highly concentrated. By this measure the hospitals in U.S. is not very competitive and there is high concentration of hospitals, around 0.33 in metropolitan areas as of 2006 (Bhattacharya et al., 2014). According to (Capps & Dranove, 2011) in 2009, the hospitals were highly concentrated in over 80% of the 335metropolitan areas (Capps & Dranove, 2011). According to Maggie Maher, a survey was conducted in 2003 by the California Nurses Association which showed that 64 out of the 100 most expensive hospitals in the U.S. is located in the three major cities – California, Florida, Pennsylvania. (Report available at: http://cna.igc.org/top200) (Idelson, 2003). More over the hospitals were charging at least 206% more than the actual cost of the service provided in 2002, based on a study conducted by the Institute for Health and Socioeconomic policy (Maher. M, 2006).

**Conclusions (regarding rationality)**

Now we come back to the first question, whether profit maximization rationality goes with the rationality of health care providers which is the Hippocratic Oath. In the U.S., in the beginning of the 20$^{th}$ century, hospitals were a place of charity where doctors used to treat patients based on their health conditions and finance remained subordinate to the goal of health maximization. (Refer 4.3.1). When investors and entrepreneurs took over insurance systems and hospitals with commercial objectives in view, it became a market; hospitals went into the hands of investors whose first objective is to maximize profit and the only way for hospitals to survive was by meeting the requirements of the investors that financed them. The objective of health care changed from health maximization to profit maximisation or enhancing shareholder value for publicly listed hospitals, especially by raising market share.

However, unlike certain commercial businesses, hospitals do not compete on price but on quality, especially, according to health care economists (Refer 4.3.2. 1.C), through accumulation of medical technology. Evidence suggests that when there is over-accumulation of medical technology there will be over-consumption of medical services also. The fee-for-service remuneration system contributes to an accumulation of medical services which leads to more money for the doctors as well as the hospitals, enabling them to finance their technological 'arms race'.

There are also other reasons for doctors to become profit maximizers. As mentioned in (section 2.2.1) physicians or graduates are also under financial pressure as a result of an education system that no longer supports its youth. Unlike in Europe the education system in the U.S. has never been free or funded by the government except for some state universities. Some students get a grant based on their academic excellence but almost 60% of all students do their education by taking student loans which they have to repay (Looney, 2015). The higher education act of 1965 significantly changed the relation between government and universities (HigherEducationActof1965). The universities had to depend on the students' fees for their funding (Wolanin, 2003). This was made stronger with the Reagan reforms with his effort to bring down the role of National Education Department (Wolanin, 2003). In 2012, the amount pending in terms of students' loan in the US has come to about 1 trillion dollars (Banjo, 2015). According to Shelly Banjo American student loan debt would surpass the GDP of Australia, New Zealand and Ireland combined (Banjo, 2015).

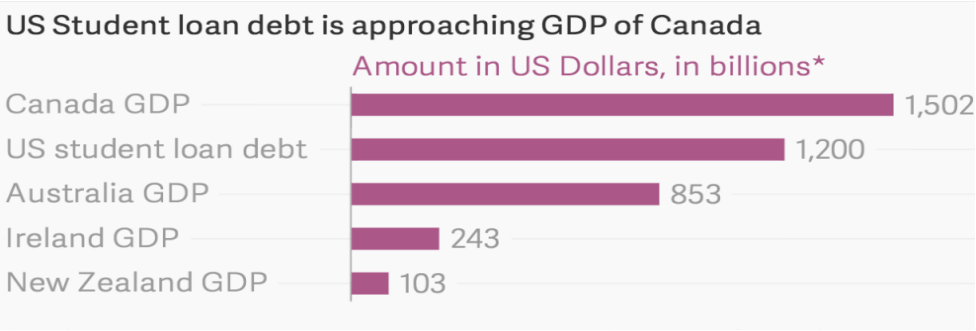



**Figure 17:U.S. Student loan debt (Amount in $)**

**Source: (Banjo, 2015) [ Based on Data collected from Federal Reserve of New York**].

When we talk about for-profit hospitals we might think that not-for-profit hospitals are working with health care as their priority and community service as their target (M Maher, 2006). As the cost of health care started spiralling the not-for-profit hospitals could not sustain themselves solely on philanthropy (M Maher, 2006). This was an opportunity for the

market. They happily provided capital for the not-for-profit hospitals for the very same reason for which they provided funds for "for profit" (M Maher, 2006). By 1981 92% of the funding for not-for-profit came from bonds that were exempted from tax. This market-conform mode of financing forced not-for-profit hospitals also to redefine their objective (M Maher, 2006). According to Maggie Maher, after all Standard & Poor is not going to rate the bonds based on the charity work the organization did but based on the profit they made (M Maher, 2006).

Doctors are in the profession of life saving based on only one rationality, the Hippocratic Oath. Their duty is to put their patient's life and wellbeing into priority. Here there appears to be an uneasy fit between the nature and task of health care and the aim of neoclassical economics. According to neoclassical economics there are buyers and suppliers only. In health care suppliers can be the doctors and buyers can be the patients. However, the rationality of neoclassical suppliers is always to maximize the profit and this is where the neoclassical rationality contradicts with that of health care. In health care the rationality of a doctor should be such that he should not be a profit maximizer but only a health maximizer.

There appears to be an uneasy fit if not clash of paradigm between the rationality of doctors who have taken the Hippocratic Oath and whose priority is to improve patients' health and save their lives and neoclassical market rationality.

Moreover, the introduction of competition has not achieved its self-stated goal of cost reduction. When hospitals are forced to operate like commercial businesses in a market, they end up in a technological 'arms race' that leads, on the one hand, to unnecessary treatments, which significantly increases the use of technology per patient and raises the costs of health care, and on the other, to the rejection of patients who are not able to pay. The rising costs, however, are also a consequence of an insurance system in which costs of medical treatment can be passed on to insurance companies, which facilitates maximisation of medical services in a fee-for-service based system. Therefore, although it seems safe to conclude that neoclassical rationality is not a match for medical rationality, it is less clear whether the rising costs of health care can be ascribed to the introduction of a neoclassical market only, since other factors such as the insurance system in place and government regulation that supports it also play a role. In the next chapter we investigate to what extent the rising costs of health care are due to non-neoclassical factors such as government regulation and private sector bureaucracies.

## 5.2 Information Asymmetry

According to Kenneth Arrow's famous 1963 article on *Uncertainty and the Welfare Economics of Medical Care*, patients have limited knowledge on illness as well as the treatments (J. K. Arrow, 1963). Always doctors are more informed about treatments and patients have to depend on them for treatment. As already mentioned in section 2.2.2, many neoclassical economists claim that information asymmetry is no longer a problem in health care because patients today are much better informed due to developments in information technology. In the next section we will investigate whether advertisements is removing information asymmetry as is claimed by neoclassical economists.

### 5.2.1 Is Kenneth Arrow right- Doctors have more information?

I would like to explain this with a small example. When we want to buy a bag, we browse the internet, compare the prices, ask other people's review about their experience and then make a rational choice. However, when we fall ill, are we in a comparable situation? When we fall sick, we show certain symptoms. However, in order to make out what we need to 'buy', we need to know what exactly our problem is. If we do not know what we are demanding for, it is the supplier of health care (the doctor) who has to tell us what is good for us. We cannot compare health care with bags and we cannot return it if we do not like the service. Assuming limited knowledge on the part of patients, the supplier is the king and he decides what the 'consumer' should buy. Internet can only help us to give information but they cannot advise us on what health care is good for us. Especially when we or our loved ones end up in an emergency room it is not possible for us to rely on internet or ask for reviews before we decide what service to buy. We are at the mercy of the doctors and follow what they say. This is clearly evident from section 5.1.7 where data supporting over treatment of patients are given. Hence information asymmetry exists in health care (Shmanske.S, 1996), (Blomqvist.A, 1991), (J. K. Arrow, 1963).

### 5.2.2 Are consumers getting informed or getting converted into neoclassical consumers?

As already mentioned unlike other OECD countries, in the U.S. Direct to consumer advertising (DTCA) is allowed by law. The rationale behind allowing DTCA is that it removes the information asymmetry (refer sections 2.1.2 & 2.2.2) between the doctors and the patients. The question is whether it is the reality?

According to (Larson et al., 2005) 60% of the advertisements plays on customer's emotions, inducing fears, hopes and anxiety. Less than one percent mention cost and less than 2 percent

mention safety. The target audience are not just sick people but also healthy people who demand more tests due to fear and anxiety. They studied more than 172 ads that came in the newspapers during 2002 and found out various marketing strategies used by various health related institutions and industry which is listed below.

**Table 4-Marketing strategies used in advertising by various health related institutions**

| **Marketing strategy** | **Definition** | **% of total ads studied** |
|---|---|---|
| Emotional appeal | Evokes feelings such as hope, fear, happiness, anxiety focussing on health risk, disability or death | 61.5% |
| Mention symptom or disease | Specifically mentions a symptom or disease | 53.3% |
| Promote gateway offer | Offers free or nominal fee service likely to lead to further business; offers seminar or other educational forum promoting specific service | 47.5% |
| Focus on technology | Highlights technology ("high tech," "cutting edge," "innovative," "at the forefront," "most advanced resources") | 33.6% |
| Increase awareness of a specific service | Promotes awareness of a specific available service | 21.3% |
| Mention convenience | Highlights ease of access to services ("multiple locations," "appointments available," "all at one site") | 21.3% |
| Suggest medical miracle | Claims services advertised to be miraculous, breakthrough, life changing. | 12.3% |
| Highlight comfort | Suggests comfort with experience of services (less pain, low stress) | 5.7% |

| | | |
|---|---|---|
| Use testimonial | Promotes service(s) via endorsement by a celebrity, patient, or health provider | 5.7% |
| Minimally invasive | Specifically uses the term "minimally invasive" to describe service | 4.9% |
| Use statistics | Uses any form of numerical statistic ("1 in 4," "80%," "2/3's") | 4.9% |
| "FDA approved" | Specifically cites FDA approval status of service advertised | 2.5% |
| Safety | Gives safety claims regarding the advertised service or procedure ("low-risk," "safe," "reversible") | 1.6% |
| Mention cost | Mentions cost of service or likelihood of reimbursement; "covered by most insurance" | 0.8% |

**Source: (Larson et al., 2005)**

According to (Frosch.LD, Krueger, Hornick, Cronholm, & Brag, 2005) American television viewers see almost 16 hours of drugs and device advertisements each year. They recorded ads shown during evening news and prime time hours and tried to learn how they influence the people. *This report was presented at the 27th annual meeting of the society for medical decision making, San Francisco Calif, 22 October 2005.* Emotional appeal was present in 95% of the ads and no ads mentioned life style change as an alternative for products. Some ads even portrayed medication as a way for regaining control over life (85%) and 78% were portrayed as medical breakthrough (Frosch.LD et al., 2005). Even though DTCA are allowed based on the rationale that it serves the educational purpose, studies show that they give no information on the cause of a disease and just oversell the benefits of the drugs (Frosch.LD et al., 2005). DTCA rarely inform rather persuade (Huh & Cude, 2004), (Bell, Wilkes, & Kravitz, 2000). Most of the information is flawed and incomplete and does not educate people but rather induces demand in them. (Huh & Cude, 2004), (Bell et al., 2000), (Almasi, Stafford.S, Kravitz, & Mansfield, 2006). A study of 320 drug advertisements in US magazines revealed that they rarely give information on the success rate of treatment but are successful in persuading people to demand more of the advertised drugs (Kaphingst, Jong, & Rudd, 2004). The study also revealed that the majority told only about the benefits and none

talked about the risk (Kaphingst et al., 2004). Most of the studies confirm that DTCA induce consumer request for the specific drug for which the advertisement is shown (Stange, 2007), (Huh & Cude, 2004), (Bell et al., 2000), (Almasi et al., 2006). Another study was done by Harvard/Massachusetts General hospital on DTCA effectiveness where 643 physicians were surveyed. Physicians were asked whether DTCA were making patients demand for unneeded treatment; almost 60% of the physicians agreed. They say that DTCA has an impact on patients' request for drugs as well as procedures and it has an impact on drug expenditure.

At this juncture it is very interesting to look into a report by *World Health Organization (WHO) in 2015* (WHO, 2015). DTCA has been legal in the U.S. since 1985 but took its present form after 1997 when the FDA eased its rules, obliging companies to inform the consumers on the side effect of the drug (WHO, 2015) . Since then the industry is said to have spent at least on average 5 billion dollars for advertisement alone in 2014 (WHO, 2015) .According to World health organization (WHO, 2015) "advertisements are only helping to drive needs in the minds of the people rather than inform people" (WHO, 2015). They cite an example of a cholesterol drug Lipitor by Pfizer (WHO, 2015). In the advertisement a distinguished doctor who claimed to be the inventor of the artificial heart turns to the camera and recommends Lipitor for keeping cholesterol away and thus keeping your heart healthy (WHO, 2015). It was a campaign put together at a cost of US $ 260 million (WHO, 2015). But the reality is that the doctor who claimed to be the inventor of the artificial heart was not even a doctor and had no legal license to prescribe any drugs (WHO, 2015) . According to the WHO, surveys show that when a patient asks for a specific drug by name, they receive it more often than normal, thus increasing the sales of the drug (WHO, 2015).

### 5.2.3 DTCA – Is it giving right information?

The question whether, is DTCA always giving right information, will be explained with the help of two cases. The first one, Vioxx case belongs to pharmaceutical industry and the second one Guidant's defibrillators' case is from the medical technology industry.

#### a. Vioxx Case

The history of the development and marketing of drugs reveals some noteworthy developments (Krumholz, Hines, Ross, Presler, & Egilman, 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004). One example is the withdrawal of the drugs rofecoxib (Vioxx) on September 3 2004 by Merck&Co, one of the ten largest pharmaceutical companies in the world (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson,

2004). Vioxx (rofecobix) is a non-steroidal anti-inflammatory drugs (Krumholz et al., 2007) . Anti-inflammatory drugs in general have digestive risks (Krumholz et al., 2007). Merck came up with its studies which showed that the drug was easy on intestine and had less of digestive risks (Krumholz et al., 2007). They did only short term studies to prove the efficiency of the drugs (Krumholz et al., 2007). Merck succeeded in getting the approval from FDA to drop the intestinal warning risk label from the drugs (based on the study) which was a breakthrough for the company (Cicuttini & Nelson, 2004). They vigorously marketed the drug and an amount of $161 million was spent on marketing (J. Weiss, 2009). It is said that Merck spent more than Pepsi and Cola for marketing their 'digestive system safe' arthritis drug (J. Weiss, 2009). In 2004, Merck had to withdraw the drug from the market after a study- Vioxx gastrointestinal outcome research (VIGOR) revealed that Vioxx doubled the risk of heart attacks and deaths (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009) . By that time almost 40,000 deaths had already taken place due to Vioxx and 25 million people had taken the drug (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009). Remarkable is the revelation made by a scientist belonging to FDA when the U.S. Department of Justice and U.S. Securities & Exchange Commission investigated about the scandal (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009). He said that he discovered the Vioxx heart risks earlier itself, but his bosses in FDA forced him to quash that information (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009).

Since the early developmental stages of the drug itself Merck knew about the cardiovascular risk but an internal mail made public due to litigation proved that emails were exchanged between the company officials on brushing it aside (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009). . The academic authors who studied about the drugs were asked by Merck to change the manuscript (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009). . Merck promoted their study supporting the drug by even distributing 1 million reprints to circulate to doctors and other professionals to push their drugs (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009). Merck still denies all the allegations and they are fighting the case person by person (Krumholz et al., 2007), (DrugWatch, 2014),(Cicuttini & Nelson, 2004), (J. Weiss, 2009).

**b. Guidant's defibrillators' case:**

Medical Technology industry is also not different from the pharmaceutical industry. This can be illustrated with a case study about a young college student who had a genetic heart disorder of irregular heartbeats and had a defibrillator implanted in his heart, a device that uses jolts of electricity to shock an erratic beating heart. He was checked by the physicians every three months. They were shocked to know that he died because the device had short circuited in his heart. The device was given by Guidant the nation's second largest maker of pacemakers and defibrillators. Doctors from the hospitals searched the Manufacturer and User Facility Device Experience (MAUDE) database maintained by the FDA, to find that it already contained reports of adverse effects and threat of short circuiting (Steinbrook, 2005).Neither the company nor the FDA bothered to alert the doctors on the bad effects of the machine. Despite reports of adverse effect the defibrillator was already in the market. In that hospital itself at least 50 patients were already given the defibrillator including the boy's father (Steinbrook, 2005). The boy's death brought the company under criminal investigation. It turned out that the company found out about the flaw at least 3 years before the boy died. They made some changes but continued to sell the old devices along with the new ones with the malfunctioning fixed. No public statement was made about the problem or the corrections made (Steinbrook, 2005). If a public statement is made about the problem stock prices would slip and it would affect the profitability of the company. (Based on a true story that came in New York Times by Barry Meier on 20 October 2005), (Steinbrook, 2005).

All the drugs to reach the market require FDA approval. FDA demands that all the drugs should show their effectiveness and safety in the clinical trials before reaching the market. (Angell, 2002). The vast majority of the clinical trials required for a drug or a device to prove its efficiency and safety are sponsored by the industries itself (already mentioned in section 4.1.4 and 4.2.4) (Angell, 2002). The clinical trials require participation of doctors mainly from academic medical research centres where the trials are done (Angell & Relman, 2002). When companies whose aim is profit maximization are themselves sponsoring the clinical trials it is very evident that there is conflict of interest between the parties (Angell & Relman, 2002) . Their aim is to sell profitable drugs and not those which are safe or useful (Angell & Relman, 2002). The clinical trials are done by doctors, institutions, clinical investigators who are benefiting from the companies (refer section 4.2.3 about unholy relationship between the various actors) (Angell & Relman, 2002).

### 5.2.4 Are DTCA for promoting 'me too drugs'

According to (Garattini, 1997) drug development and marketing has become a major business that it is also following the same rules that other commercial businesses follow. It cannot be seen as a positive tendency as the true aim of drug development is to make available health-promoting and life-saving drugs to the people at the lowest possible cost with reliable and precise information (Garattini, 1997). In their quest to make exorbitant profit, rather than making break-through drugs they make 'me too drugs' which are chemically related to the prototype and poses identical action (Garattini, 1997), (Angell & Relman, 2002) . Me too drugs are brought into the market by the pharmaceutical companies to maintain their market share (Hanekamp, 2007) . When the prototype drugs are developed through R&D the companies manufacture their chemically identical version also (Hanekamp, 2007), (Hollis, 2004) . Once the patent of the prototype expires these chemically identical 'me too drugs' are introduced in the market to maintain their market share (Hanekamp, 2007), (Hollis, 2004). According to (Hollis, 2004) me too drugs are just similar to their pre-existing drugs and they diminish the incentive for innovation in pioneering drugs (Hollis, 2004). According to (Bergua et al., 2012) (based on a data analysis of 31 groups of drugs) they found out that there was more than 60% price difference between the prototype as well as the 'me too drug' where 'me too drug' was not showing any significant benefit. Charles Ornstein and Ryann Grochowski Jones did a comprehensive analysis on how much drug companies invest on doctors in 2013 (Ornstein & Jones, 2015) . Their analysis found out that most of the products that the drug companies try to promote is not cures, or breakthroughs or top sellers but only me too drugs (Ornstein & Jones, 2015). For most of the highly promoted 'me too drugs' even more effective cheaper varieties are already available (Ornstein & Jones, 2015). They try to promote 'me too drugs' as having significant medical advantages and fewer side effects (Ornstein & Jones, 2015).

### 5.2.5 Promotion

We have already seen in section (4.1.3) and section (4.2.4) how medical device industry and drug companies influence the decisions of doctors by giving them lucrative offers like leisure travel etc. Companies are making me too drugs and are trying to promote the product by means of advertisements as well as through the doctors.

In 2014 the federal government initiated a rule which mandated the pharmaceutical and medical device companies to report their payments to doctors and their teaching hospitals (Ornstein & Jones, 2015). They also developed a tool which shows how much money the

companies spent on doctors for promoting their products (Ornstein & Jones, 2015). The link is given below. http://projects.propublica.org/open-payments/.

According to the data available, we can see that companies have spent more than $ 9 million on doctors to promote Victoza a drug which is developed by Novo Nordisk. It is said that this drug with a once a day injection can lower blood sugar among diabetics. But new research and advocacy groups have found out that this drug with increase the risk of thyroid cancer and pancreatitis. The medical device which is shown the most payment is Intuitive Surgical's da Vinci robot system. It is found out that this device is very expensive and over used whose details are given in the next section on robotics in surgery (Ornstein & Jones, 2015).

**Conclusion (regarding Information Asymmetry)**

The parties on the two sides of the relationship have changed. The suppliers of information are no longer doctors, but commercial producers of medicine and medical technology. Today, the information asymmetry increasingly regards patients and doctors on the one hand, and commercial producers along with the FDA and the insurance companies (who decide which medicines and technologies will be reimbursed) on the other. Since commercial interests differ from the aims of doctors, and producers of medicines and medical technology are not doctors, this means that the nature and quality of information that is given will also change.

### 5.3 Standardization of health care

As explained in section 2.2.5 standardization of health care is suggested as a way to reduce cost and increase the quality of health care. In chapter 3, section 3.4 I have explained why standardization is inevitable for reducing cost and how different methods of standardization like EMR (Electronic Medical Record), Pay for Performance (P4P) , automation and robotics would help ensure low cost and high quality in health care. But that does not mean that introduction of standardization in health care is free from critics. The question in this section is, how standardization of health care achieves the goals of cost reduction and quality improvement.

One of the conditions for the neoclassical perfect market is homogeneity of products (refer sections 2.1.5, 2.2.5). Does this assumption, originally designed for the manufacturing sector (Head.S, 2014), hold in health care? In health care, patients are different with different constitution and each doctor uses his experience and acumen to observe each patient, collecting information from each patient and treating him accordingly (explained below). This raises the question whether health care fits the neoclassical assumption of homogeneous

goods. However, under pressure from financial investors, health care is increasingly standardised (Bain & Company 2012). Do the efforts directed at homogenising the product result in a health care that increasingly fits the neoclassical model? But if homogeneity does not tally with the tasks and aims of health care, what will be the consequences for quality and costs of health care?

### 5.3.1 A history of standardization

An important person in the history of standardisation is American mechanical engineer Frederick Winslow Taylor, who sought to raise the efficiency of production processes by applying engineering principles such as standardisation on the factory floor ('industrial engineering'):

> *It is only through enforced standardization of methods, enforced adoption of the best implements and working conditions, and enforced cooperation that this faster work can be assured. And the duty of enforcing the adoption of standards and enforcing this cooperation rests with management alone (Taylor 1911).*[6]

According to (Browne, 2006) Taylor developed the idea that technology could be used not only to produce goods but also for controlling the work force. Before Taylor, the majority of tasks were carried out by 'skilled' labourers who learnt their skills through various kinds of job training and apprenticeship (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). Taylor found out that due to this, workers were more knowledgeable than managers, and workers made most of the decisions. This gave workers more bargaining power during this time. Taylor found that managers were unable to control their own workers since workers knew more than the managers with regard to their job (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). According to Taylor, managers should study all the tasks in a very detailed manner by dividing them into the smallest subtask which he called the motion and time study and check whether their workers are performing efficiently with the required speed and minimum time. Managers should be planning all the work after studying it and lay down rules and regulations and workers should be performing them in the most efficient manner based on the guidelines given by managers which would ensure productivity growth (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). The basic principle and tool of scientific management is to standardization, i.e. giving and applying specific guidelines and rules for performing a task

[6] Taylor, F.W. (1911) *The Principles of Scientific Management*.

(Keir, 1918). Thus, standardization in manufacturing came as a result of Taylor's 'scientific management' which ensured strict laws and formulae and guidelines which specifically told each employee what they had to do (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). It provided standardization of jobs and prevented deviation.

Breaking down each work into the smallest, simple, repetitive task to be completed by the workers depending on the instructions they get from their managers does not require any skill at all (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). Indeed, Taylor suggested that skill and knowledge should be removed from the workers and it should rest with the managers and this is the best possible way of controlling the workers (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006).

This principle of scientific management was first introduced by Henry Ford in his factory. The main features of 'Fordism' when he applied 'Taylorism' in his factory were – a) single product was produced on a mass scale by fixed machine on assembly lines. b) Work is broken down into the smallest possible task which could be done easily without much skill. c) Workers do not make any decisions and they are closely watched and controlled by the managers and supervisors. d) The speed of the work is controlled by the speed of the assembly line which in turn is programmed based on the decisions made by the managers. e) Workers lose their skill, knowledge and control over the speed and the process. By standardising production on an assembly line and through mass production, Ford was able to make the cheapest car (Browne, 2006). But the cars which he produced were limited in variety, style and colour. He once commented that 'the 'Model –T' was available in any colour as long as it is black'. In 1929, he produced almost 15 million cars using unskilled workers.

Baverman was the first person who introduced the word 'deskilling' in connection with scientific management. He said that due to scientific management workers are becoming more deskilled (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). Deskilling is the process by which due to division of labour and fragmenting of work employees lose their integrated skills and knowledge (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). Efforts to standardize jobs using automation has led to deskilling of labourers (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). According to Baverman deskilling was aimed at increasing production and making labourers cheaper and easily replaceable, thus raising the profit for the companies (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). In manufacturing this has

been successful as far as production was concerned as it resulted in the mass production of products. However, according to Head (2014) who compares U.S. 'scientific management' to the German skill-based model, 'scientific management' is not superior in terms of efficiency and profitability than German skill-based production. Simon Heads explains this with the help of a case study of a manufacturing unit in Germany (a machine tool company 'Chemnitz') which he compares it with a similar factory designed on Taylorist principles in the U.S (Head.S, 2014).

The German skill based method left the workers to their on supervision. They grouped together discussed their jobs, made their own plans and delivered the project on time. The senior management only came into the picture when it was time to negotiate with the client.

The same job when performed in an American factory floor would be accompanied by a job being divided into many small components with each person performing a very small part accompanied by many supervisors to supervise them.

Now standardization using automation is getting transferred to services such as health care where the quality of treatment is determined by interaction between doctors and patients who are unique. Some of the methods as already mentioned in chapter 3 are introduction of Electronic Medical record System (EMR), introduction of Pay for performance (P4P), and automation of procedures using robotics. Doctors are given specific guidelines in the form of checklist which gives them specific instruction on what treatment is to be prescribed to a particular patient. Hospitals are now even competing on the level of 'protocolization' as it is said to ensure quality (Bain & Company). If standardisation and protocolisation are said to ensure quality, what is the evidence supporting this claim? If it does not improve quality, what explains the push towards standardization of health care?

### 5.3.2 Does standardization in health care lead to higher quality?

Standardization which has been applied in factories for the production of goods which are identical are getting applied in health care also. This raises the question whether health care is also like other goods and whether the application of standardization in health care would ensure higher quality.

**a. Why healthcare is different**

When it comes to health care a doctor is not dealing with a machine but with a patient. Different people have different physiology and different temperaments and personalities and they live in different social contexts Schuitmaker (2012). According to Schuitmaker (2012), humanity is known to be in six billion varieties. Standardization of health care leads to a uniform treatment of a disease based on statistical averages computed from a specific set of people in the past (Schuitmaker.J.T, 2012). This average may not give much information on every, or perhaps even any, individual patient living today (Schuitmaker.J.T, 2012). For the same disease different patients show different symptoms; vice versa, the same symptoms or disease may have different causes in different patients, which can only be assessed by doctors from the interaction with the patients based on the information collected from them. Standardization may well be applicable to routine aspects of production, but to what degree is it applicable to human beings, asks (Schuitmaker.J.T, 2012).

This can be made clearer with an example. For example there are 5 patients of different age, sex and weight who want to undergo a hip transplantation surgery (Hodgson, 2007). Even though the procedure looks the same, i.e.: a standard surgery, in this case the hip transplantation surgery, the detailed procedures would vary (Hodgson, 2007). The drugs required, post-operative care required all varies between the patients (Hodgson, 2007). Even if patients with similar health care needs are put together to benefit from economies of scale and specialist skills, the truth is that their detailed procedure would vary substantial (Hodgson, 2007). A highly standardized procedure would be applicable only to a limited number of cases (Hodgson, 2007).

For example, in a system of standardised treatment, all patients diagnosed with peptic ulcer disease would be treated as suffering from the same disorder. However, a study of six patients diagnosed with peptic ulcer disease and treated with traditional Chinese medicine found that Chinese physicians treated each patient differently, because the peptic ulcer disease was found to have its cause in different disharmonies in different patients. [7]

According to (Hodgson, 2007) health care should vary according to idiosyncratic needs of the patients (Hodgson, 2007). This is the main difference between health care and manufacturing.

[7] See: Cooperative Research Group of Peptic Ulcer (1980) Typing of peptic ulcer disease according to Traditional Chinese Medicine and preliminary exploration of its pathological basis, *Journal of Traditional Chinese Medicine*, February 1980, p. 17−21, referred to in Kaptchuk, Ted J. (2000) *The Web that Has No Weaver. Understanding Chinese Medicine*, London: McGraw-Hill.

When we are making cars, we are producing identical cars with the same features and quality. It is also necessary that all cars are made the same way also. When we are treating people, each person is unique as are their health care requirements.

### 5.3.3 Electronic Medical Record System (EMR)

As the name indicates EMR helps in the digitized record keeping of each patient (Hillestad et al., 2005). Once a patient is admitted in the hospital, all the medical details about that patient is recorded in the system (Hillestad et al., 2005). This records are accessible by any other hospital in any part of the country (Hillestad et al., 2005). With the implementation of EMR, if a patient in New York who is a patient of hospital A in new York is getting sick in California in hospital B, then hospital B can access all the previous records of the patient using the EMR system and treat the patient accordingly. But the EMR system does not end there. It not only digitizes the records of the patient but also automates the treatment the doctors are supposed to give to the patients. Doctors would receive a checklist based on which they are supposed to treat the patients. Basically EMR leads to standardization of health care where the doctors are specifically instructed on what kind of a diagnosis, treatment, procedure or medicine they should give for a specific health problem (Hillestad et al., 2005).

In 2005, The RAND Corporation in California announced that the U.S. health care system could save $81 billion annually if EMR is established and it would also lead to higher quality of health care (Hillestad et al., 2005). Even though RAND Corporation announced about the higher quality of health care there is no evidence so far produced by RAND Corporation on the quality of health care how it would be measured and how it could be ensured through standardization. The question is whether quality of health care and health care professionals would be enhanced through EMR and whether it would benefit social welfare?

As already mentioned the EMR does not come with medical records and it's sharing alone. The EMR is also incorporated in decision-making software. It provides checklists, prompts, guidance and suggestions to the doctors – also known as 'protocolization' of medicine Bain & company.

#### 5.3.3.1 EMR leads to inflated bills

According to a study done on the effectiveness of the EMR system where thousands of doctors were interviewed, one of the major consequences of standardization using the EMR system is that the doctors would end up recommending more tests and therefore more billing

(Schutle, 2012), (AmericanHealthInformationManagementAssociation, 2014), (Cormick, Bor, Woolhandler, & Himmelstein, 2012). The system automatically recommends procedures when the doctor fills the symptoms (Schutle, 2012), (AmericanHealthInformationManagementAssociation, 2014), (Cormick et al., 2012). For example when filling the file of a diabetic patient the system would generate a checklist to consider all the tests regarding diabetic even if according to the acumen of the doctor they are not needed at that moment (Schutle, 2012), (AmericanHealthInformationManagementAssociation, 2014). When the system asks the doctor to perform all the tests he is bound to do it which ultimately leading to inflation of the medical bills (Schutle, 2012) (AmericanHealthInformationManagementAssociation, 2014) (Cormick et al., 2012), because if the doctor, on the basis of his own judgement of the symptoms and constitution of the patient and his acumen, prescribes a different procedure, the HMO will not fund the bill (Schutle, 2012) (AmericanHealthInformationManagementAssociation, 2014), (Cormick et al., 2012).

#### 5.3.3.2 EMR leads to more tests

According to (Cormick et al., 2012) the EMR leads to more treatments also. They analysed 28,741 patient records from 1,187 physicians in 2008 (Cormick et al., 2012). Physicians who had EMR were ordering 40-70% more tests especially imaging tests than those without (Cormick et al., 2012). Even the number of blood tests ordered were more in the case of doctors who were using EMR. This clearly shows that the EMR does not lead to cost control of health care. When the doctors type in a specific disease of the patient, the EMR system would recommend all the standard tests that particular disease requires even if, according to the doctor, this particular patient does not require those tests at that moment (Cormick et al., 2012), (Schutle, 2012).

One of the positive aspects of the introduction of EMR is that since checklists are provided to the doctors on the specific treatments they should prescribe unnecessary treatments could be avoided. But the above evidence suggest that EMR can lead to unnecessary treatments also.

#### 5.3.3.3 Impact of EMR on doctors' skills

In 2010, 78 U.S. physicians were interviewed to know whether the U.S. health care system, which was adopting new innovations in the form of EMR as well as automated clinical guidelines, is leading to a deskilling of doctors (Hoff, 2011). The researchers found that by way of the EMR which asks and obliges the clinician to follow computerised protocols,

doctors are getting deskilled (Hoff, 2011), (Carr, 2014) and the doctor-patient relation is getting hindered (Hoff, 2011), (Rouf, Whittle, Lu, & Schwartz, 2007), (A, M., & Ziv A, 2009), (Carr, 2014). Due to standardization, the doctors end up with decreased clinical knowledge and increased stereotyping of the patients (Hoff, 2011), (Rouf et al., 2007), (A et al., 2009), (Carr, 2014) . The doctors are getting deprived off their individual knowledge and data (on the basis of own observation by doctors) which is essential for patient care is disappearing (Hoff, 2011), (Rouf et al., 2007), (A et al., 2009), (Carr, 2014). Computerization of health care is eroding doctors' intellectual endeavour and preventing them from their search for knowledge (Hoff, 2011), (Rouf et al., 2007), (A et al., 2009), (Carr, 2014). If the computer is giving all the answers, the doctor does not need to learn or even think to find a solution; rather, he just follows the instruction given by the decision-making software (Hoff, 2011), (Rouf et al., 2007), (A et al., 2009), (Carr, 2014).

Health care is a profession, even an art (geneesk*unst* in Dutch) ; ärztliche Kunst in German), which works on trust and personalized service (Payne, TenBroek, Fletcher, & Labuquen, 2010), (Lown & Rodriguez, 2012), (Carr, 2014). When doctors merely ask the questions that the checklist on his computer ask them to answer, he does not differ very much from a robot (Payne et al., 2010), (Lown & Rodriguez, 2012), (Carr, 2014). According to studies, with increased computerization doctors end up copy-pasting or 'cloning' notes; the age of dedicated note writing based on deep observation of and discussion with the patients is disappearing (Payne et al., 2010), (Lown & Rodriguez, 2012), (Carr, 2014).

Standardization does not recognize mutual communication between doctor and patient as part of the treatment and it is seen as inefficiency or a process hampering productivity growth (Hoff, 2011), (Carr, 2014). In the process, doctors are losing their ability to understand their patients which impairs their capacity to make informed decisions (Payne et al., 2010), (Lown & Rodriguez, 2012), (Carr, 2014). The notes provided by senior doctors always was a learning experience for the junior doctors which is now disappearing with computerization (Payne et al., 2010), (Lown & Rodriguez, 2012), (Carr, 2014). The computer actually competes with patients for getting the attention of the doctor (Schutle, 2012), (Payne et al., 2010), (Lown & Rodriguez, 2012), (Rouf et al., 2007), (A et al., 2009) (Carr, 2014).

The EMR system provides on-screen warning to doctors in the form of triggers if the doctor prescribes a combination of drug which can produce adverse effect (Weingart et al., 2003), (Carr, 2014). Weingart *et al.* (2003) studied the override rate among 3481 alerts generated at 5 primary care practices (Weingart et al., 2003). For more detailed study they selected a

random sample of 67 alerts where physicians did not prescribe a medication and 122 alerts that resulted in a prescription written by the doctor (Weingart et al., 2003). Factors were identified which led to over riding an alert (Weingart et al., 2003). Analysis was done to find out whether ignoring an alert led to an adverse drug event (Weingart et al., 2003). Studies show that nine out of every ten alert is unnecessary and it is causing *alert fatigue* for doctors. Due to this low probability in getting a valid alert doctors sometimes have also ignored even the valid ones which had to be considered seriously (Weingart et al., 2003).

#### 5.3.3.4 Automation Bias & Automation Complacency

There are two kinds of knowledge in this world, tacit, and explicit knowledge. Tacit knowledge helps us perform tasks naturally without thinking (Carr, 2014). Explicit knowledge is declarative and we derive them when we consciously learn about it (Carr, 2014). Computers actually use explicit knowledge to perform jobs (Carr, 2014). Now information technology has developed to an extent that attempts are made to also automate work like that of doctors (Carr, 2014). But is it possible to automate all aspects of the work of a doctor, or does this lead to a narrowing down of what a doctor should be?

As argued by Carr (2014), the consequence of too much automation is that it degrades our capability to think. We become mentally lazy (Carr, 2014). Another consequence of automation is automation complacency and automation bias (Carr, 2014), . Because of automation we are not routinely called on to interact with our surroundings which leads to fading of our awareness and concentration (Galletta, Durcikova, Everard, & Jones, 2005), (Alberdi, Strigini, Povyakalo, & Ayton, 2009). We are so overwhelmed with the process of automation that we do not even know how deterioration of skill is happening and how to measure it (Galletta, Durcikova, Everard, & Jones, 2005). As in the case of doctors we would be so accustomed to computers that we forget to learn how to react to an emergency or when some unusual circumstances arise (Carr, 2014). After all software engineers cannot assume all the situations and program the computer or robots essentially(Carr, 2014) (Alberdi et al., 2009). We destroy our mind's ability to observe accurately and translate the knowledge thus acquired into insight (Carr, 2014), (Alberdi et al., 2009).

Another consequence is automation bias. For example in the case of health care the doctor might give attention only to an area which is highlighted (as happens today for example in case of automated processing of X rays) and overlook an early-stage tumour or other growth that is not captured by the software. We would be so accustomed to follow what the computer

tells us. Complex tasks like diagnosing and treating a patient comes from practice and it is years of hard work and experience which makes us into a good doctor. Povyakalo, Alberdi Strigini & Ayton developed a method using regression analysis to estimate the quality of decisions made by doctors using computer and applied it to computer-aided detection (CAD) cancer (Povyakalo, Alberdi, Strigini, & Ayton, 2013). They analysed 50 professional who interpreted 180 mammograms with the aid of the computer and without it. The study revealed that sensitivity decreased by 95% for the experts who used computer aid and the advent of cancer was overlooked (Povyakalo, Alberdi, Strigini, & Ayton, 2013).

Apart from its impact on the quality of health care, an important factor leading to automation is that it reduces challenges, boosts 'productivity' (measured as the number of patients that can be treated, which can be increased with automation), reduces labour cost (by giving more importance to speed) and thus maximizes profit. In this process people are getting so accustomed to computer commands that it determines the way we work, moulds our character and makes us feel helpless (or even as if we are dying) when we switch it off (Carr, 2014).

In this section we have focused on critical studies warning for negative effects of the automation of health care in terms of a deskilling of doctors; this is not to say that automation cannot play a positive role in health care at all. Positive aspects of automation and standardization by means of EMR are given in section 3.4.

### 5.3.4 Pay for Performance (P4P)

Along with standardization which is attained by means of setting guidelines, rules and specific instructions on how to do a particular job, Taylor also said that specific goals should be established for achieving maximum productivity and achievement of this goal should lead to rewards (Sutherland & Canwell, 2004), (Beder, 2009) (Rees, 2001), (Browne, 2006). This is the aim behind P4P. Specific goals are set and once these goals are achieved you would be rewarded.

P4P has been successful in enhancing productivity especially in the manufacturing sector (Buetow, 2006). It is now implemented also for doctors in an attempt to raise productivity in health care (Buetow, 2006). In pay for performance the basic idea is that you meet the target and a bonus is paid accordingly (Buetow, 2006), (Mahar.M, 2006), (Wessel, 2005). Money acts as the motivation as well as the catalyst to perform a job (Wessel, 2005).

However, the rationality of a health service provider is not money or to perform his job for money but to maximize the health of the patient irrespective of the monetary benefit it fetches

(Mahar.M, 2006), (Buetow, 2006), (Wessel, 2005). Ethical questions arise. How do incentives affect the responsibility and behaviour of doctors? Can incentives induce doctors to behave against the Hippocratic Oath and against the interests of their patients? Philosopher Ruth Grant (2011) argues that incentives can be used as an instrument of power and she asks whether constant incentivizing undermines active, autonomous citizenship. What is the impact of financial incentives on doctors? Do they enhance their performance as doctors, or erode it?

Another difficulty is with regard to coming up with criteria or key performance indicators that could be set as a target for doctors in health care (Buetow, 2006), (Mahar.M, 2006), (Wessel, 2005). The question is whether it is possible to quantify complex human transactions like those between a doctor and a patient (Mahar.M, 2006), (Head.S, 2014). Even if criteria are set, could they induce doctors to pick those patients whose treatment would help them meet their target and avoid those which can hinder their KPI scores? (Buetow, 2006), (Mahar.M, 2006), (Wessel, 2005). Could they mould doctors in such a way that they are no longer health maximizers treating patients based on their health condition and need but giving service based on how well the patient can be utilized for meeting their target, thus defeating the very rationality of health care?

### 5.3.5 Automation through Robotics

Automation of surgery using robots is one of the major innovations in health care. Robots are expected to lead to higher productivity and efficiency (ref chapter 3). Robotic technology is proliferating in the U.S. and Europe for the last four years (Barbash & Glied, 2010). The number of robot-assisted surgeries has tripled since 2007 and the number of robotic technology (equipment) established in US has increased by 75% (800 to 1400) (Barbash & Glied, 2010). They can work the whole day without fatigue unlike human beings (Barbash & Glied, 2010). They are expected to enhance quality even though their uses and efficacy are still not fully tested and established.

FDA performed a study to know the cost effectiveness and safety of the Da Vinci System. The findings of the study have made the FDA and other experts wonder whether its benefits are overstated (Andrews, 2013). Robotically assisted hysterectomies increased from 0.5% in 2007 to 9.5% of all hysterectomies in 2010 (Wright et al., 2013), (Andrews, 2013). Three years after the first robotic procedure at hospitals where robotically assisted hysterectomies were conducted, robotically assisted hysterectomies accounted for 22.4% of all

hysterectomies (Wright et al., 2013), (Andrews, 2013) . The overall complication rates were similar for robotic assisted as well as laparoscopic surgeries which they replaced (5.5% vs 5.3%) (Wright et al., 2013), (Andrews, 2013). Total cost of robotically assisted hysterectomy was $ 2189 more per case compared to laparoscopy (minimal invasive surgery), 6% more than that of laparoscopic surgery. (Wright et al., 2013), (Andrews, 2013), (S.Jain & Gautam, 2015). Moreover, surgeons must perform 150 to 250 procedures to learn the process and get used to it (Barbash & Glied, 2010). When the amortized cost of robot is taken into consideration the total cost rises to $ 3200 or about 13% more than when it was done laparoscopically (Barbash & Glied, 2010), (Andrews, 2013).

In March 2013, the American Congress of Obstetricians and Gynaecologists issued a statement saying that good data proving that robotic surgery is cost effective or better or even as good as laparoscopic surgery are not yet available (Andrews, 2013), (Barbash & Glied, 2010), (Haddad & Lotan, 2014).

With the proliferation in robotic technology installation the number of surgeries ( for example prostatectomy procedures) where robotic technology is widespread and has increased by 60% between 2005-2008 while the incidence of prostate cancer showed a decreasing tendency in the U.S. over the same period (Barbash & Glied, 2010). Studies show that those people who received diagnosis of prostate cancer in 2005 is about 14% more likely to have undergone surgery by 2007 than their counterparts who were diagnosed with prostate 3 years back (Haddad & Lotan, 2014). In 2004 only 4% of the patients underwent surgery where in 2010 it increased to 67% (Haddad & Lotan, 2014). This indicates that robotic technology has contributed to surgical rather than non-surgical treatments for this disease (Haddad & Lotan, 2014), (Barbash & Glied, 2010). Not only the cost but the volume of surgeries also increased with the introduction of robotic surgery (Haddad & Lotan, 2014), (Barbash & Glied, 2010 ). The number of surgeries increased at a time when the overall risks were found to be equal for both the robotic procedure as well as the conventional methods. Most interesting thing to note is that despite high cost robotic technology has not contributed to an increase in quality of in the long run. For example, the robotic surgical system is reported to contribute to many injuries to different parts of the body (Tsuda et al., 2015), (Villamere, Gebhart, Vu, & Nguyen, 2015), (Muller et al., 2015). According to (Tsuda et al., 2015), robotic technology would completely replace traditional surgery techniques going forward. But this will raise costs substantially. The cost of health care is estimated to increase by 2.5 billion annually with the introduction of robotic technology without any noted increase in benefits (Tsuda et

al., 2015), (Barbash & Glied, 2010). Thus, robot-assisted surgery has not been found to be cost-effective from an economic point of view (B. S. Williams, Prado, & Hu, 2014). With the increase in the number of surgeries due to the introduction of robotic technology the cost is even going to escalate (B. S. Williams et al., 2014). This is also due to advertisement that induces patients to demand for robotic surgery thinking that it is going to benefit them (Tsuda et al., 2015), (Barbash & Glied, 2010).

If the robotic technology is spiralling the cost of the health care without producing much benefit in terms of safety the question is how society is going to benefit out of it (Tsuda et al., 2015), (Barbash & Glied, 2010) . The technological development from open surgery to laparoscopy (minimal invasive surgery) has been proved beneficial but the question is why there is a shift to robotic surgery when it is not proved more beneficial than the conservative techniques (Tsuda et al., 2015), (Barbash & Glied, 2010). According to a study of 96,694 laparoscopic and robotic procedures (Villamere et al., 2015), robotic surgery did not prove to be better than laparoscopic surgery in terms of hospital mortality or major complications (Villamere et al., 2015). At the same time costs were 21% higher for robotic surgery than for laparoscopy (Villamere et al., 2015).

If robots can do a better and safer job than doctors in health care and can work without fatigue throughout the day, would help lower the cost of health care while also raising its quality. But if robotic surgery is not safer and giving better results and, moreover, is more costly, why is it used in surgery?

It could of course be argued that new products are always expensive when they are first introduced, and often also not very safe; but over time costs will fall and safety will increase. However, there are also other problems associated with robots, to which we turn now.

**a. Other Aspects of Robotics**

So far we have only tried to probe into the economic consequences of using robots in health care. However, we are looking into a future where we would be confronting autonomous robots in all sectors (Sparrow, 2007). If we make *"robot doctors"* and give them full autonomy (to reduce costs) who would be held responsible for an atrocity committed by the robot that would normally be described as a crime? If it is doctor who commits a mistake during an operation or treatment he would be held directly responsible and be persecuted (Sparrow, 2007) .

Robots of the future (autonomous robots) would be capable of acting on their own (Sparrow, 2007). An artificial intelligence robot system would be able to determine by itself what it should do, and make its own decision. Sometimes their decision cannot be predicted also. Autonomous systems would be so independent that they take their decisions based on some reasons but these reasons would be subjective to the internal states like desires, beliefs, and values of the system itself (Sparrow, 2007). They will even have the ability to learn from their experience also. This clearly means that their actions are going to be unpredictable as we cannot know what kind of learning they are going to make from their experiences (Sparrow, 2007). In fact it is predicted that future artificial intelligence will poses capacities equal to or even exceeding human beings (Sparrow, 2007). When robots become autonomous they also should take the moral responsibility for the actions they do (Sparrow, 2007). The dilemma arises here. If the machine does something wrong deriving its decision from its experiences since it is said to be autonomous who would be held responsible for its action. The machine, programmer, the designer or those who own the capital or one that orders them into action would be held responsible. If there is no ethical or moral code in place for these machines how it could be introduced in the market (Sparrow, 2007). Till now there is no definite answer to these questions (Sparrow, 2007). But machines have started becoming autonomous taking its own decision and even killing people. Recently in a Volkswagen plant in Germany a robot killed a worker by crushing him against a metal plate for which no reason as such is officially declared (Guardian, 2015). Since robots help in increasing productivity and thus enhance profit maximization nobody can stop these machines from reaching the market(Sparrow, 2007). As (Wynsberghe & Sio, 2015) claims that there are no simple and straightforward answers to these questions yet. A one-sided emphasis on productivity and profit maximization would overlook many important aspects that could be socially harmful.

This does not mean that robotics and automation is always wrong. In section 3.4.1.3 the positive aspects of robots and automation in health care is explained in detail. There are certain routine tasks as well as some tasks which require accurate precision that robots can perform (refer section 3.4.1.3) and also which are humanly not possible as well as dangerous also. These kinds of tasks can be performed by robots and this relieves human beings to perform some other tasks that require cognition.

### 5.3.6 Why is there a push towards standardization?

Why are standardisation and robotisation promoted on such a large scale when so little is known as yet regarding their benefits and possible harmfulness? On the basis of an analysis

of the literature for possible answers we conclude that there are three different views or explanations (culture and economic) laid down by different authors for why standardization is extended to health care.

#### 5.3.6.1 Economic reasons behind standardization

According to Bain & Company our world is 'awash with money'. By 2010 the world's financial assets (refer appendix 1 for explanation on what constitutes financial asset) had swollen to 600 trillion dollars and they are estimated to reach $ 900 trillion by 2020 (Bain&Company, 2012b). Although awash with money, the world is also facing stagnation as evidenced by a high unemployment rate and stagnating wages (Palley 2012). Fewer investment options are available in the economy and with less options to multiply wealth, an economic disquiet is prevailing among financial investors (Palley, 2012). Moreover, owners of capital are scared of asset-bubble risk and other risks regarding the conventional investment options. Investing in savings and bond is no longer an option now the rate of return is kept low due to the intervention of the U.S. Federal Reserve Bank after 2008 recession and risk diversification as a safety net seemed to remain only in the papers during the recession and thus lost its credibility (Bain&Company, 2012b). The only option to multiply wealth, according to Bain & Company (2012), is to find new investment options. One of the new investment options identified by Bain & Company in its 2011 report of 'the great eight: Trillion dollar growth trends to 2020' is "keeping the wealthy healthy" (Harris, Kim, & Schwedel, 2011). According to Bain & Company in advanced economies, chronic conditions are increasing and health care costs are inflating (Harris et al., 2011). The transformation of health care into a consumer good is expected to induce demand for new products and services (Harris et al., 2011), while manufacturers and investors make a push towards increasing the productivity of the care providers (Harris et al., 2011). A main way in which the productivity and efficiency in health care could be enhanced is by standardizing the health care by way of 'protocolization' (Bain&Company, 2012b). According to Bain& Company this would alter the basis of competition in the "market place". The "market place" would be competing on standardization (protocolization) (Bain&Company, 2012b). This would enhance efficiency and productivity. In the manufacturing sector, workers are given specific instructions on what specific task need to be carried out. They are given specific goals which they have to achieve (Head.S, 2014). Priority is given to speed or the increased rate at which output could be produced (Head.S, 2014). This is ensured through automation where specific guidelines are given leading to standardization (Head.S, 2014). It is assumed

that the same strategy of standardization or protocolization would help ensure productivity gain in health care also.

#### 5.3.6.2 Cultural reasons behind standardization

Nicholas Carr in his book *The Glass Cage* gives a different perspective on automation. He explains how robots, self-driving cars and digitized medicine (EMR) can make people disengaged from the real world (Carr, 2014). He warns that we are becoming so dependent on the computer that we are not using our knowledge and mind and just following the instructions the computer gives us based on the guidelines set by the top management. People are getting deskilled in this process (Carr, 2014), (Head.S, 2014) . According to Heads we are just becoming robots in the hands of other people by just following instructions given to us by our top management. The top management is using CBSs (Computer Based Systems) not only for giving instructions but also for the purpose of monitoring its employees – a phenomenon which he calls 'corporate panoptics'.

CBSs have not only led to deskilling of people and increase in productivity but also accumulation of the wealth in the hands of a few people, say just 1% of the people (Hacker & Pierson, 2010), (Head.S, 2014). The share of the total income of the top 1% rose from 8% to 18% between 1974 and 2007 (Hacker & Pierson, 2010), (Head.S, 2014) . As a result of CBSs the share of the top richest people, 0.01% rose from less than 1% to 6% during this period. Between 1980 and 2006 the annual earnings of fully employed workers with a bachelor's degree has only increased by just $1000 (constant) which is just a percentage increase of 2.26% (Hacker & Pierson, 2010), (Head.S, 2014). According to Carr and Simon Head, standardization was implemented in manufacturing industry where each job was carefully analysed and subdivided into smaller jobs. Workers were given specific instruction by the managers on how each job had to be carried out and the speed at which it had to be carried out (Head.S, 2014). Each job and each action was carefully monitored by the managers to prevent any deviation (Head.S, 2014). Before standardization the workers knew about their jobs very well. They possessed knowledge and they gained this knowledge through training (Head.S, 2014). With standardization the workers were deskilled, where they knew only about their specific tasks and all the knowledge and decision making rested with the managers. Priority was given for speed (Head.S, 2014). In lesser time how much more you can produce or in other words how to increase the productivity of each worker was set as the goal. With automation of jobs this objective was achieved by factories which ultimately led to profit maximization (Head.S, 2014). With automation and advent of CBS (Computer

Business Systems) it was not only productivity that was achieved. Companies ensured that monitoring of each employee on his every motion was also made possible with CBS. Now through CBS (Computer Business Systems), these disciplines of manufacturing like measurement, standardization and monitoring are brought far beyond the factory sites to retail, financial sectors, and education and to health care also (Head.S, 2014). Even service sectors have targets in the form of Key Performing Indicators (KPIs) which tells them, how many loans they should process day, how many patients a doctor should treat and how many papers a professor should produce one year.

According to Simon Head CBSs are "amalgams of different technologies that are pulled together to perform highly complex tasks" and at the same time they ensure top-down control and monitoring of each individual in the business (Head.S, 2014). Simon heads call this business of monitoring as corporate panoptics. Most CBSs have a third element called an 'expert system' that mimic human intelligence in performing cognitive tasks for complex jobs in health care, education, customer service etc. (Head.S, 2014). An example of 'corporate panoptics' in health care is that a doctor may send a bill for treatment but the HMO might return it saying that it does not fit into 'best practice' embedded in their system (Head.S, 2014). To give an idea what a standardised health care system could look like, the example of Walmart could be a case in point (Head.S, 2014). Walmart is hailed as the best company which is selling products at the cheapest rate. The question is at what cost? In Walmart, the movement of employees is monitored minute by minute (Head.S, 2014). Each employee is attached to a navigation machine which gives them direction when they carry material to the shelf for unpacking (Head.S, 2014). This machine calculates the time taken for each unloading and compares it with a benchmark time which is recorded in the machine to see whether the employee is meeting the target (Head.S, 2014). When employees improve their speed, the machine increases the targets until it has come to a level that is not humanly possible to achieve. If the targets are not met, salaries are not paid and there are severe consequences. Workers are struggling to meet these targets. They are struggling between the constant surveillance of the management and the threat of losing their jobs (Head.S, 2014). Also in human resource management it is not people who are determining who should be taken for a job but it is the system which is programmed by an engineer sitting in another part of the world. The employees can just follow the instructions given by the computer (Head.S, 2014). If the HR executive feels that a particular candidate has certain skills and many of the system given requirements could be bypassed in recruiting him, the HR executive cannot

voluntarily do that even though he feels that the candidate is eligible to get that particular job (Head.S, 2014). Head also gives the example of the influence of CBS in education system where now in Cambridge professors are given targets on how many papers they should produce each year (Head.S, 2014). Those who do not meet their 'targets' will not get 'grants' to continue their research and job with the university (Head.S, 2014).

Nicholas Carr in his book shares a deeply human perspective about standardization. He fears that we are becoming too dependent on the computers that we are deskilling ourselves (Carr, 2014). We are not using our brains and we are just following the instruction given by the computer. He explains this with the example of automatic flights (Carr, 2014). If the flights are run using auto pilot system then the pilots would be so disengaged that they would lose their ability to think and act during an emergency situation (Carr, 2014). It is the same with doctors. The skills of a doctor in treating a patient develops with their experience. If they are just made to follow the instruction given to them like what HMO's are doing right now, they will not develop their talents and they would just become like robots who carry out instructions of a computer. Our life would become easier with computers but we should know the boundary where we should draw a line (Carr, 2014).

**Conclusion (regarding standardization)**

Advocates of standardisation in health care expect many positive effects of standardisation for health care in terms of both higher quality and cost reduction. However, such claims are seldom supported by empirical evidence. In this section we have investigated these claims by reviewing critical studies warning for negative effects of the standardisation of health care through protocollisation and robotisation. Critics of standardisation point to several factors that raise (rather than reduce) costs, such as over-billing and over-treatment as a result of protocollisation, and rising costs of surgery due to high fixed and variable costs of robotic surgery.

## Conclusion

In this chapter it is investigated whether health care services can be traded like other products in a market. It is found that the introduction of neoclassical market features has led hospitals and doctors to compete with each other by engaging in a 'technology arms race', over consumption of health care, duplication of devices, rationing (denying services based on financial capability) and also consolidation of hospitals leading to high cost. When it is said that because of the advancement of technology and increased use of internet information regarding medicines, health care services and medical products are widely available, reality shows that 'direct-to-consumer advertising' through various media is only leading to increase in patient's demand for treatment. The suppliers of information are the pharmaceutical as well as the medical technology companies themselves and they are guided by their financial interests. Evidence suggests that this clearly affects the nature of information which is getting transferred to the people. Finally, neoclassical competition in health care would require homogeneity of health care services which, however, by nature of differences between doctors and between patients, are not homogeneous. However, attempts to reduce the costs of health care have led to the introduction of Taylorist 'scientific management' leading to standardisation or homogenisation of health care services. Applied to health care, 'scientific management' has led to protocollisation and an increase in robotic surgery. According to its critics, however, both have raised the cost of health care. Protocollisation has led to over-billing and over-treatment, while the fixed and variable costs of robotic surgery are higher than those of conventional treatments.

# 6. Are the rising costs of U.S. health care due to government regulation?

## Introduction

In chapter 4 and 5 I investigated whether the rising costs of health care in the U.S. are due to the attempts to apply the neoclassical model to health care. I analysed four 'sub-systems' consisting of physicians, hospitals, the pharmaceutical industry and the medical technology industry separately. However, according to proponents of the opening up of health care to the market, the cause of the rising costs of health care is not the introduction of the market but government regulation. In chapter 6 my aim is to investigate this claim. I examine to what extent each of the four 'sub-systems' of the U.S. health care system is government-regulated.

In section 6.1 we ask whether the high costs of physicians' services are due to restrictions imposed by government on the supply of doctors. Can the cost of services be brought down while increasing their quality by increasing the supply of physicians? In section 6.2 we analyse whether the introduction of Health Maintenance Organisations (HMOs) which, according to health care economist (J. P. Feldstein, 2012) ensures competition between physicians, brings down cost. In section 6.3 we examine the role of the FDA in the high costs of prescription drugs and medical devices.

## 6.1 Government regulation 1: restricting the supply of physicians

According to proponents of the introduction of a (neoclassical) 'free market' in health care, one of the reasons for the high costs of health care in the U.S. is the restricted supply of physicians. In U.S. health care, entry to the profession is restricted by government by means of licensing (K. Arrow, 1963), (Ubokudom, 2012). On neoclassical logic (assuming competition, profit-maximisation etc.) licensing imposed by the government restricts the supply of physicians which will raise the price of the physicians' services (K. Arrow, 1963), (Ubokudom, 2012). As explained by Kenneth Arrow, the reason for restricting the number of physicians in health care by licensing is to ensure minimum quality. Through licencing only restricted number of seats are available for medicine which ensures that only the bright students get admission. Licencing is ensured through various tests which ensures that only the capable students become doctors. (K. Arrow, 1963), (Ubokudom, 2012).

### 6.1.1 Does raising the supply of physicians lower costs per service?

According to neoclassical health care economics (J. P. Feldstein, 2012) when the supply of doctors is increased, competition would increase and this would bring down the cost in health care (refer section 2.2.3). Raising the number of physicians will force physicians to compete

on price which will bring the price of their services down. The idea is that the high costs of physicians per service is due to the *absence* of such competition due to licensing. So our questions for this section are: has licensing raised the costs of physicians' services? *Vice versa*, does raising the supply of physicians bring down costs?

According to OECD data (OECD.Stat, 2015) the supply of doctors has been increasing over the years. The density of doctors per thousand people was 2.3 in 2004 and it has increased to 2.6 in 2013. According to the data available, the increased supply of physicians over time has been accompanied by an increase in the price *per service*. This has not lowered the *total* cost of health care due to an increase in the *volume* of health care services. Reasons for the increase in the *volume* of health care by physicians have been given in chapter 5 and they include profit maximization motive of the hospitals and doctors, influence of the pharmaceutical as well as medical technology industry, pressure on the doctors due to educational loans, fee for service etc.

For example, according to OECD statistics, the number of diagnostic exams has increased from 3977.9 per thousand of the population in 1997 to 7377.1 per thousand of the population in 2014. The total number of diagnostic exams has increased from 25100000 in 1995 to 81200000 in 2014. Consultations have increased from 3.3 in 1995 to 4.1 per capita in 2010 (OECD.Stat, 2015). However, regarding the *price* of health care (per service), the increase in the number of physicians or has not been accompanied by a decline in the price *per health care service* by physicians.

According to some studies (Bhattacharya et al., 2014) and (K Patel & Rushefsky, 1999), physicians cannot compete on price (refer section 5.1.3). Patients take into account many other factors like distance, facility, loyalty and experience of the physician when deciding to shift from one physician to another. What counts in the case of a physician is quality rather than price. (Refer section 5.1.5). Where health care providers have started competing with each other, according to (Bhattacharya et al., 2014) and (K Patel & Rushefsky, 1999), they compete on quality which in the case of the U.S. means mainly medical technology and facilities (refer section 5.1.5).

According to Feldstein (2012), even though the number of doctors is restricted by means of licensing, according to Feldstein (2012), the number of doctors in the U.S. is large enough for the 'physician market' to be considered as a competitive market. Rather than raising the number of doctors, (J. P. Feldstein, 2012) claims that the way to reduce the price of

physicians' services is managed care in terms of HMOs (Health Maintenance Organizations) and PPOs (Preferred Provider Organization). This would ensure competition between doctors which would help bring down cost (section 6.2).

### 6.1.2 Is licensing needed to maintain a minimum level of quality of physicians?

An important factor in health care besides cost is quality. Does licensing increase quality, as is claimed by proponents of such regulation?

It is not very easy to measure the quality of physicians but different studies show that the quality of American health care is poor when compared to other OECD countries, especially if the high costs of health care in the U.S. (or quality per dollar) are also taken into consideration (TheCommonWealthFund, 2014), (HarvardT.HChan, 2011). (Goldman, A, & Mcglynn, 2005) studied the quality of health care using criteria such as how many people receive adequate care (underuse of health care), overtreatment or overuse, the number of errors made by physicians, delays, etc. (Goldman et al., 2005). They found that more than one third of the procedures were carried out for reasons for which there is no clinical research to support it. (Goldman et al., 2005). 46% of the U.S. population are not even getting adequate care. (Goldman et al., 2005).

Although it is hard to prove a relationship between licensing and the quality of health care, because the latter depends on so many factors besides licensing, there appears to be little ground for the claim that licencing alone can ensure the quality of physicians.

### 6.1.3 Does deregulation reduce the costs of health care? The role of advertising

A rule forbidding 'direct-to-consumer-advertisement' in health care was removed in the U.S in 1985. Feldstein (2012) claims that 'direct-to-consumer-advertisement' is inevitable for bringing down costs in health care (refer section 2.2.2). Advertisement would help to inform patients about price, quality and other attributes (J. P. Feldstein, 2012). Patients would be able to compare the price and quality attributes and make an informed choice on from whom they should receive treatment (J. P. Feldstein, 2012) (refer section 2.2.2).

Various statistical studies indicate that 'direct-to-consumer-advertisement' has been used to create demand by propagating fear, anxiety and hope; according to (Larson et al., 2005) only less than 1% of advertisements mentioned cost. (Refer section 5.2). Studies show that demand for the product being advertised shows an upward trend after being advertised (Cross, 2007). Therefore, 'direct-to-consumer-advertisement' is likely to raise rather than lower cost in health care (Culyer, 2014), (Cross, 2007) (refer section 2.2.2 , 2.1.2). As (Cross,

2007) explains best advertisement does not mean that it is the best product but it is only that they have hired the best advertising agency.

### 6.1.4 Can increased supply lead to increased competition in the present situation?

As seen in Section 5.1.5 health care providers compete on quality, mainly the availability of medical devices. Historically the physicians in the U.S. have operated as independent practitioners (ThePhysiciansFoundation, 2012). Statistics show that the number of solo practicing doctors have been decreasing in U.S. and they are moving to group practices or large chains of hospitals (ThePhysiciansFoundation, 2012). According to (ThePhysiciansFoundation, 2012) the number of independent physicians as a percentage of total physicians in the U.S. was 57% in 2000. It decreased to 49% in 2005. In 2009 it decreased to 43% and by 2013 it came to 33% (ThePhysiciansFoundation, 2012), (Elliott, 2012).

A survey was conducted by (ThePhysiciansFoundation, 2012) to know the reasons why doctors no longer want or are no longer able to do solo practice by sending e-mails to 80% of the doctors in the U.S. The survey was sent to doctors from almost 50 states all over the U.S. Almost 60% of the doctors responded. The main reasons they mention are (a) the increased high capital intensity requirement, (b) the increased need for administrative and business ownership initiatives and responsibilities (ThePhysiciansFoundation, 2012). According to (Jacobs, 1993) a study conducted by Medical Society for the State of New York revealed that hospital employment of orthopaedic surgeons has increased by four times between 2004 and 2010. The main reasons for leaving solo practice and moving to hospitals as well as large group practices are the need for huge outlays of technology requirements (refer section 2.1.4 2.2.1 and 2.2.4), decline of reimbursements, and increases in reporting and administrative requirements. (Jacobs, 1993).

According to (Baltic, 2014) it is not only physicians but also hospitals which are getting consolidated. And consolidation leads to higher cost in health care (refer section 4.3.2.1.h). Almost 105 mergers happened in 2012 up from 50 to 60 from 2005 to 2007. Why consolidation is happening and how consolidation (as measured by the HHI index) leads to increase in cost is explained in section 5.1.10.

In short, increasing the supply of doctors in a system that incentivises doctors to compete on technology ((refer section 2.1.4 2.2.1 and 2.2.4), and necessitates them to incur high costs of

administration and acquisition of funds (see also Section 6.3.1) is unlikely to lead to more competition and lower cost.

### 6.2 The insurance system

According to neoclassical economists health insurance would lead to moral hazard (Jost, 2007) . They argue that the high costs of health care are due to the 'soft budget constraint' created by the insurance.

At this juncture it is very important to look into an article by Malcolm Gladwell. He says that health care is different from other products. You go to a doctor only when you are sick (Gladwell, 2005), (Finkelstein, 2015). Health care should not be a product which you should be consuming because it is available for free or its cost has gone down (Gladwell, 2005), (Finkelstein, 2015) . He says that you would be consuming more ice creams when its cost goes down. But you will not be consuming more health care because its cost has gone down or it has become affordable (Gladwell, 2005), (Finkelstein, 2015). If people are consuming more health then it is because of the demand inducing activities of the industry and the profit maximization objective of the health suppliers (as discussed in chapter 4) because of the availability of the insurance and lack of government regulation in this area. The insurance industry is also allowing this to happen since when the cost of health care goes up the insurance companies can charge high premiums for the insurance. However, is the alternative (no insurance and therefore no health care for patients without the ability to pay) acceptable? A solution that has come up that is said to both guarantee access to health care for all and limit the growth of costs is 'managed health care' (again through insurance companies). Can this system bring down costs while maintaining the quality of health care?

#### 6.2.1 Can HMOs bring down the cost while maintaining the quality of health care?

As per Feldstein (2012), 'managed care' in terms of HMOs (Health Maintenance Organizations) and PPOs (Preferred Provider Organization) are a good means to reduce cost in health care as they would ensure competition between doctors. HMO's are an initiative of the health insurance companies to bring down the average price of physician fees and limit the over-use of services and thus ultimately to bring down health care cost (J. P. Feldstein, 2012). The self-stated aim was to limit the use of services by standardizing health care (by means of EMR), an instance of 'scientific Taylorism' applied to health care (see Section 5.3) that would lead to homogeneity of goods – thus making come true an important assumption of neoclassical theory (Refer section 2.2.3).

Insurance companies formed Preferred Provider Organizations (PPO's), that is, groups of doctors to care for those who have enrolled for the insurance (J. P. Feldstein, 2012). The doctors can become part of PPO's only if they reduce their cost by discounting their price (J. P. Feldstein, 2012). PPOs are based on two basic ideas with potentially important consequences. The first is the assumption that the service of each doctor is substitutable (J. P. Feldstein, 2012) – a neoclassical assumption (of homogeneous goods) made true through standardisation (refer section 2.1.5 & 2.2.5). Second, PPOs make use of the reality that doctors need access to patients with insurance; in order to have such access, they have to be part of PPO's (J. P. Feldstein, 2012). To become part of PPO's they have to compete among each other and bring down their cost to the minimum possible level (J. P. Feldstein, 2012). In the following paragraphs we discuss these two ideas and their possible consequences in reality.

### 6.2.2 Are the services of doctors substitutable?

As argued by various authors (reviewed in section 4.3.2.1.b) health care is not substitutable but is a differentiated product. The efforts made to homogenize health care (refer section 2.1.5 & 2.2.5) by means of standardization to convert health care into a substitutable product to make it fit into the perfect competition neoclassical model may have significant implications for the quality of health care, as explained in section 5.3.

### 6.2.3 Can insurance companies provide health plans at a lower cost?

Since HMOs are run by insurance companies, it is relevant to look into the insurance market in the U.S who are the final buyers of the provider services as well as suppliers to the consumers. In U.S. almost 50% of the insurance market is in the hands of just five companies as of 2014 which shows that it is an oligopolistic market. Table 1 shows the market share of the companies involved.

**Table 5- Market share (Insurance companies - U.S.)**

| Name | Market Share |
|---|---|
| United Health | 17% |
| Well Point | 10% |
| Aetna | 7% |
| Humana | 7% |
| Cigna | 5% |

**Source:(KaulkinGinsberg, 2015)**

According to (WSJ, June 19, 2015) Insurance companies in the U.S. is in a merger spree. United Health Insurance Company is chasing Cigna & Aetna (WSJ, June 19, 2015). Humana is already a candidate to be taken over by other companies (WSJ, June 19, 2015). The merger fever would ultimately lead to only just three companies (called 'players') in the insurance market leading to an even more strongly oligopolistic market structure (refer sections 2.1.3 & 2.2.3) (WSJ, June 19, 2015). According to (Michaeluj, 2010) study conducted by American Medical Association which shows that in 166 of 294 metropolitan areas (56%) a single insurer controls more than half the business in HMOs and PPOs (Michaeluj, 2010).

As mentioned in (section 2.2.3) through PPOs insurance companies become the sole purchaser of health care as providers can get access to insured patients only through PPO's. Here the neoclassical assumption of many buyers is violated (refer section 2.1.3 & 2.2.3). According to (Pauly, 1998) PPO's lead to monopsony in health care. This arrangement can be socially beneficial only if the product bought in this market (involving physicians and PPO's) by the PPO's could be sold at a lower price to the end consumer (the patient) (Pauly, 1998), (Harrison & Blair, 2010), (Greenberg, 1998). However, in practice this does not happen; rather, profit-maximising insurance companies add any cost reductions to their profits. (Pauly, 1998), (Harrison & Blair, 2010), (Greenberg, 1998). Rather than enhancing welfare, monopsony leads to (refer section 2.2.3) (Pauly, 1998) claims that the health policies of insurance companies using their market power to reduce medical spending are harming both the providers of health care as well as the consumers; see also (Harrison & Blair, 2010),

(Greenberg, 1998). According to (Pauly, 1998) antitrust laws are not modified enough to deal with monopsony situation (Harrison & Blair, 2010), (Greenberg, 1998).

### 6.2.4 Can HMO's ensure competition between physicians in the long run?

The PPO's will lead to competition between physicians only when there are a large number of doctors. But statistics show that because of the huge capital intensity requirement doctors are now grouping together and moving into larger group practices as well as joining hospitals unlike the earlier times as explained in 6.1.4. (Refer section 2.1.4, 2.2.4, 2.2.3 also). This gives them power to negotiate fees for their services with PPO's (J. P. Feldstein, 2012). If all the doctors in a particular area group together they can demand higher fees and PPO's have to agree to it as they do not have any other choice (J. P. Feldstein, 2012) . In other words, rather than bringing about competition between doctors, PPO's would ultimately lead to monopoly (J. P. Feldstein, 2012).

## 6.3 Is government regulation the reason for high drug as well as medical device price?

According to Paul Feldstein the high cost of drugs and devices are due to the regulations introduced by government by means of FDA (Food & Drug Administration). The pharmaceutical companies as well as the medical device industry invest a lot of money in research & development (J. P. Feldstein, 2012). After having developed the drug or device, they incur high costs due to the delay incurred in the approval process done by the FDA (J. P. Feldstein, 2012), which pushes the prices of drugs and medical devices up.

However, the question is how valid this argument is. Our examination in chapter 4 of the way in which pharmaceutical and device companies work in reality suggests that large parts of the R&D for medicines and medical devices is done from public budgets. Moreover, lobbying by medical industries has resulted in a number of acts (such as PDUFA, PDUMA) which help them maintain their profitability Finally, the main goal of an insitute like the FDA regards not the costs but the quality of health care. If the FDA is to be removed, as suggested by Paul Feldstein (J. P. Feldstein, 2012) and (Krarmer, 2006) what other alternative solution would ensure the safety of drugs?

## 6.4 The major cost factor in health care: (absence of) regulation with respect to technology

Absence of regulation with respect to pharmaceutical as well as technology industry is a major factor contributing to health care cost (Krarmer, 2006) . How the industries are

performing and how and why they are contributing to health care costs is presented in chapter 4.

**Conclusion**

Are the high costs of health care due to government regulation, and could they be reduced by removing regulation? In this chapter we have reviewed five types of regulation that are important in U.S. health care: (1) licensing, (2) the insurance system, (3) the introduction of Health Maintenance Organisations, (4) the role of the FDA, and (5) regulation (or its absence) regarding the use of technology in health care.

With respect to licensing we conclude that it is unlikely that removal of licensing and increased supply of doctors will reduce the cost of physician services because, when choosing a doctor, patients take into many factors besides the price of a service. Moreover, the introduction of competition between physicians and hospitals has led to a 'technology arms race' that drives up the use of costly technology, while the insurance system places a heavy burden on physicians and hospitals in terms of time- and cost-intensive administration and negotiation. These factors appear to be much more important in explaining the costs of health care services than the presence of licencing and the total number of doctors.

The high costs of health care are also related to the presence of an insurance system that reimburses the costs of the health care provided by the health care system. This certainly is a factor that permits prices to stay higher than they would be without such a system. However, is the alternative (no insurance and therefore no health care for patients without the ability to pay) acceptable?

A solution that is said to both guarantee access to health care for all and limit the growth of costs is 'managed health care'. In this system, any differences in quality between doctors are removed through standardisation in order to permit competition on price. However, rising costs have forced doctors to group together in order to survive financially, thus defeating the attempts to bring about competition between them.

The conclusion appears to be that the main factors in the rising costs of health care are the steep growth of the use of expensive technology, pharmaceutical products and the costs incurred by physicians and hospitals as a result of an insurance system demanding lots of administration and negotiation. The question therefore arises what role government and regulation (or the lack of it) play in the growth of these cost factors. International comparison

shows that the use of technology as well as the costs of administration and negotiation with insurance companies in the U.S. are exceptional internationally.

An interesting question, therefore, would be to what extent increased use of technology as well as the insurance system in place contributes to the quality of health care. So far, there is not much evidence that the increase in these two cost factors is matched by a proportional increase in the quality of health care. If regulation (or its absence) could play a positive role in increasing or reducing the costs of health care, it is in this two areas that it could have a major impact.

# 7. Health care systems in Canada & Netherlands

## Introduction

In chapter 4 and chapter 5 we tried to investigate whether the high health care cost in the U.S. is due to a market based system or a government based system. In this chapter we will first try to analyse the Canadian health care system which has universal coverage [Universal coverage in the Canadian Health care system is explained in chapter3 section 3.2]. Unlike the U.S. the Canadian system has always been hailed as one of the best medical systems in the world. But data show that health care costs in Canada are also increasing 9 (Refer chapter 3 section 3.2.1). I will try to analyse the reasons why the costs of Canadian health care are showing an increasing tendency now. In this chapter I have also make a start with an analysis of the Dutch health care system which is undergoing a transition in 2006 when it was opened up to competition. Since not much evidence is available as yet in English, I performed two case studies with two dentists in Netherlands who tried to explain their experiences with the new reforms that the Dutch health care system is undergoing now.

## 7.1 An Overview of the Canadian Health Care System

According to (Cohen, Cohen, Taylor, & Reznick, 1994) the way in which health care is organised in a country reflects two important factors, the cultural values and economic status of its citizens. The health care system in any country is the product of its history and culture (Schieber, 1997), (Cohen, Cohen, Taylor, & Reznick, 1994) . The Canadian health care system is a matter of national pride for their citizens (Cohen et al., 1994),(Schieber, 1997). It reflects a strong commitment towards egalitarianism (Marchildon, 2014), (Cohen et al., 1994). The system is often called socialised medicine by the rest of the world since they have universal coverage. The governments of the individual provinces have jurisdiction over their regions. The federal government has limited power (Marchildon, 2014), (Cohen et al., 1994).

In Canada there are 14 separate plans where each province is responsible for their provincial plan (Marchildon, 2014). All the legal residents are covered by these plans(Marchildon, 2014). Certain regions have more than one plan also (Marchildon, 2014) . The funds for the healthcare system are accumulated through the general tax revenues (Marchildon, 2014). Health insurance was one of the social security measures proposed at the 1945 Federal-Provincial Conference on Post-war reconstruction (Marchildon, 2014), (Duncan & McKinstry, 1992), (Cohen et al., 1994). Dr Haegarty, the principal federal health care expert instead proposed a plan to share the cost between the state and the provincial government

(Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014). One third of all the provincial funds goes to health care (Cohen et al., 1994). One fifth of the national fund is also set aside for the health care system (Cohen et al., 1994), (Duncan & McKinstry, 1992).

In Canada, even though the funding comes from the government, patients have the freedom to choose their physicians (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014). Physicians are paid "fee for service" (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014), (S. Robinson, 2008). Before 1984, if there was a difference between the fee schedule and the actual charges, the physicians had the freedom to "balance bill" which allowed them to have some control over their ultimate income (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008).

The passage of the Canadian Health Care Act of 1984 was a major turning point for the health care system in Canada (Glied, 1997), (Cohen et al., 1994), (Marchildon, 2014), (Robinson, 2008) . The "balance bill" provision which existed before 1984 was criticised by an official government commission as unfair as it denied health care access to those people who could not afford to pay the balance (Cohen et al., 1994), (Marchildon, 2014), (Robinson, 2008. The 1984 act abolished the balance bill system (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008). The act was widely accepted by the public (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008). The Canadian Health Care Act of 1984 was opposed by the medical profession as it restricted their personal income (Cohen et al., 1994), (Marchildon, 2014) , (Robinson, 2008). The Ontario Medical Association protested by calling in a strike (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008). The protest failed miserably as it failed to get support from the public (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008). They called-off the strike after 25 days. As a result of this act, the physicians lost their ability to control their income (Williams,T.R 2008), (Cohen et al., 1994), (Marchildon, 2014) (Robinson, 2008).

In Canada, the provincial authorities control the budget set aside for the health care system based on the estimated volume of health care services usually needed. (Lomas, Woods, & Veenstra, 1997), (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008). When compared to the U.S., the number of visits to doctors per capita is almost similar or even higher than that in the U.S. (OECD Data). The difference is in the per capita reimbursement made for the treatments (Himmelstein et al., 2014). The reimbursement is much less than that in the U.S. (Himmelstein et al., 2014).There are several reasons for the much lower cost that Canada employs (Himmelstein et al., 2014).

In Canada, it is illegal for hospitals to accumulate funds for new programs through the capital market (CanadianHealthAct-94-4E, 2005). The hospitals exist on a not- for-profit basis fully funded by the government (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014), (Robinson, 2008), (CanadianHealthAct-94-4E, 2005). This is one reason why technology adoption and diffusion is slow in Canada when compared to the U.S. (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014), (Robinson, 2008). Unlike in the U.S. there is no need for a medical technology 'arms race' and thus the capital requirements of Canadian hospitals is not like that in the U.S. (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008). This does not mean that in Canada people are dying due to lack of treatment (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014), (Robinson, 2008). According to (Cohen et al., 1994) there is little evidence that the patients in Canada have suffered due to unwarranted delays in technological advancement (Cohen et al., 1994),(Hall.R, 2013), (B. R. Deber, 2003). There is no study which reveals that patients have suffered due to non-availability of medical services or facilities (Cohen et al., 1994),(Hall.R, 2013), (B. R. Deber, 2003). Depending on the specific criticality of the patient availability in treatment is ensured (Cohen et al., 1994),(Hall.R, 2013), (B. R. Deber, 2003). In a free enterprise system like in the U.S., there are more early adopters of technology, but the availability of services achieved is the same in both the U.S. and Canada (Cohen et al., 1994),(Hall.R, 2013), (B. R. Deber, 2003). Most of the people in Canada are happy with the Canadian healthcare system [(86.2%) , based on a survey conducted by Toronto-based Nanos research] (McBane, 2009) and are assured that whenever a need arises their health care system is there to support them (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008).

The control of costs has been very effective in Canada due to the collective public funding (Cohen et al., 1994),(Hall.R, 2013), (B. R. Deber, 2003). As already mentioned, unlike in the U.S. there is no medical arms race and DTCA which is also prohibited in Canada (will be explained in later sections).Since all hospitals are funded by provincial government no other third parties like insurance companies affect patient access (Cohen et al., 1994),(Hall.R, 2013), (B. R. Deber, 2003).

### 7.2 Effect on administration, hospitals and physicians

The funding for hospitals in Canada requires provincial government approval (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson,

2008).The funding occurs in two parts, a) the operating budget b) the capital budget (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014) (Robinson, 2008). The operating budget is given as lump sum based on occupancy and the capital budget which requires line approval which helps in controlling the expansion (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014), (Robinson, 2008).

### 7.2.1 Administrative Expenditure

Canadians spent only $ 158 per capita on administration whereas Americans spent $667 as of 2011 (Himmelstein et al., 2014). Fifty per cent of the difference in cost is due to overhead expenses (Himmelstein et al., 2014). In Canada, since the revenue for health care is generated through taxation hospitals save considerably on overhead costs since they do not have to spend time on contacting and negotiating with many different insurance companies and evaluating different plans (Maurer & Smith, 2013), (Jacobs, 1993), (MCcarthy, Schafermeyer, & Plake, 2011), (Petrinovich, 1996), (Woolhandler, Campbell, & Himmelstein, 2003). Since it a universal system, everybody is covered and there is no waste of time and costs in determining coverage and eligibility (Maurer & Smith, 2013), (Jacobs, 1993), (MCcarthy et al., 2011), (Petrinovich, 1996), (Woolhandler et al., 2003). Reimbursement is directly from the government to the provider (Maurer & Smith, 2013), (Jacobs, 1993), (MCcarthy et al., 2011), (Petrinovich, 1996), (Woolhandler et al., 2003). There is also no need for marketing expenses and allocation of shareholder profit as the Canadian system is a publicly administered plan (Maurer & Smith, 2013), (Jacobs, 1993), (MCcarthy et al., 2011), (Petrinovich, 1996), (Woolhandler et al., 2003), (Cohen et al., 1994). If the administrative cost of the U.S. health care system had been reduced to Canadian levels, the U.S. could have saved almost $150 billion in 2011 (Himmelstein et al., 2014). The difference is due to the less market oriented payment scheme (Himmelstein et al., 2014). This is evident also from a comparison of administrative costs of for-profit hospitals in the U.S. (27%) compared to non-profit (25%) and public (23%) (Himmelstein et al., 2014). In the U.S. surpluses from day-to-day operations are required for capital funding. The need to find money for capital investment [equipment and other physical capital as well as modernization and expansion] (Himmelstein et al., 2014) requires administrators doing additional work to identify and pursue profit opportunities (Himmelstein et al., 2014).

This entrepreneurial incentive leads to hospitals to cherry pick profitable patients and exaggerating the illness of the people and bill for higher prices (Himmelstein et al., 2014),

(Woolhandler et al., 2003). In effect it shows that it is not helping to improve efficiency but only leading to higher health care cost (Himmelstein et al., 2014), (Woolhandler et al., 2003). Unlike in Canada where hospitals receive a lump-sum capital budget from the government, in the U.S. billing differs for each person which leads to more clerical work and administrative cost (Jacobs, 1993), (MCcarthy et al., 2011), (Petrinovich, 1996), (Woolhandler et al., 2003), (Himmelstein et al., 2014).

### 7.2.2 Physician Expenditure & Hospital Expenditure:

The share of the GNP going to physicians has increased only 10% in Canada whereas in the U.S. it increased by 40% as of 2013 (Himmelstein et al., 2014). Even though the mean income for physicians in both countries are almost the same there is considerable difference in fees when it comes to procedures (Petrinovich, 1996), (Cohen et al., 1994). The provincial medical association negotiates the total amount that is going to each services (Jacobs, 1993), (MCcarthy et al., 2011), (Petrinovich, 1996), (Woolhandler et al., 2003), (Himmelstein et al., 2014). The pay for a unit of service is constant in any province (Hutchison, Levesque, Strumpf, & Natalie, 2011). Since there is a fixed schedule as far as the fee is concerned, the physicians can increase their income only by offering more services (Petrinovich, 1996), (Cohen et al., 1994). But there is a limit or a cap introduced by the government to curtail inflation in charges by way of increased fees by way of increasing the volume of service. (Petrinovich, 1996), (Cohen et al., 1994). If the aggregate bill amount exceeds the cap, the fees to the individual speciality is brought down.

However, despite the cap imposed by the government, the fee-for-service arrangement is leading to higher Canadian health care expenditure even though much less so than in the U.S. (refer chapter 3). Like in the U.S., in Canada the fee for service system also reimburses for the volume of services which leads to unnecessary health care. For example, a study on tonsillectomies performed in Canada revealed that 107 per 10,000 people in British Columbia and 200 per 10,000 people in Ontario underwent the procedure (Terris, 1990). Whereas in England and Sweden where doctors are on salary the number of procedures are only 17 per 10,000 (Terris, 1990). According to a WHO study, the number of caesarean sections in Canada is 10 to 15 percentage points higher than in other countries for no particular medical reason. (Terris, 1990).

In 1988, according to an investigation done by the Assistant Auditor-General of Quebec, it was revealed that doctors were submitting bills for at least 185 procedures daily (York, 1992)

It is even named as ‘revolving door medicine’ in Canada, where patients come in and go out as that in an assembly line (York, 1992). In 1982, almost 40% of the doctors surveyed claimed that over treatment is a definite consequence of fee-for-service treatment and one third of electives surgeries in Canada is unnecessary (York, 1992). Survey also revealed that 50-80% of the patients visiting family doctors have no ‘medical problem’ other than stress, anxiety and depression which is treated by the doctors as diseases. (York, 1992). Fee-for-service gives incentives to give more prescription drugs where patients keep returning to the doctors for further check-ups which makes the patients get into an endless cycle of ‘illness dependence’ called illness parade (York, 1992). According to (Health Force Ontario 2013) fee- for-service was allowed in Canada thinking that doctors would be financially motivated to provide good services, and indulge in good doctor-patient relationship. But in reality it is leading to more services, and more medication where it is not necessarily needed. Due to this there is also move to make the doctor’s salary on capitation payment method, where they are paid fixed salary as in England and Sweden. (HealthForceOntario, 2013), (CanadianFoundationForHealthCareImprovement, 2010).

However, a difference between the U.S. and Canada is that in Canada the number of specialists is only 50% of the total number of practitioners compared to 75% in the U.S which results in a lower physician expenditure in Canada. Unlike in the U.S., physicians’ act as gatekeepers in the Canadian health care system and specialized procedures are only done in a few hospitals in Canada (Mullner, 2009), (Wolper, 2013), (Church & Mackinnon, 2010), (Marchildon, 2013) (Marchildon & Matteo, 2015).

The provincial government controls the number of physicians as well as the number of seats available for medical school enrolment (Mullner, 2009), (Wolper, 2013), (Church & Mackinnon, 2010), (Marchildon, 2013) (Marchildon & Matteo, 2015). Neoclassical economics predicts that a restriction in supply will lead to higher cost. It is interesting to note that the density of physicians per thousand population in Canada in 2012 was 2.48 as compared to 2.5 in the U.S. (OECD.Stat, 2015). If the increase in supply should lead to lower cost then the U.S. should be having a lower cost when compared to Canada given the fact that U.S. has a higher density. This clearly shows that health care is not working only on the basis of supply and demand and there are other factors like role of medical technology industry, pharmaceutical companies and hospital industry to be taken into consideration.

As we have seen, the 1984 Canadian Health Act (CHA) is a major federal legislation that ensures health care accessibility in Canada (Duncan & McKinstry, 1992), (Cohen et al.,

1994), (Marchildon, 2014), (Robinson, 2008). According to the CHA, all provinces must uphold 5 principles to qualify for federal funding for health care: *universality, comprehensiveness, portability, public administration* and *accessibility* (CanadaHealthAct, 1984).

Between 1960 and 1970, health care expenditure in Canada remained relatively stable at around 7 per cent of GDP (W. L. Robert, Ferguson, Langlois, & Kampen, 2005), (Irvine, Ferguson, & Cackett, 2005), (Coburn & Tobbance, 1998). In the 1970s, health care expenditure was only 7.1% of GDP. After that, health care expenditure increased to almost 10% in 2013 (OECD.Stat, 2015). Much of the increase in spending was due to three factors: hospitals, physicians, and drugs & medical technology (Rathwell, 1994), (CanadianInstituteofHealthInformation, 2014). How these factors started influencing the health care costs will be explained in the next sections.

Due to the oil crisis in the 1990's, the U.S. economic slowdown, the restrictive monetary policy of the Bank of Canada and the constrains on fiscal policy, led Canada into a second recession in 1990. The federal government reduced its financial support to provincial government with respect to health care funding (Wilson & Rosenberg, 2004), (Kirby, 2002), (Mazankowski, 2001), (Romanow, 2002), (Coburn & Tobbance, 1998). The federal government first indexed the annual increase in the federal contribution to the provincial health plans to a 3 year average of the gross national product, then froze any increase further (Wilson & Rosenberg, 2004), (Kirby, 2002), (Mazankowski, 2001), (Romanow, 2002), (Coburn & Tobbance, 1998). It became the responsibility of the provincial government to absorb all the cost [it was the economic recession rather than health care cost which led to federal budgeting in the 1990's] (Wilson & Rosenberg, 2004), (Kirby, 2002), (Mazankowski, 2001), (Romanow, 2002), (Coburn & Tobbance, 1998). The federal government started rationing on the budget set aside for health care which has led to a series of some high profile studies and setting up of different commissions to face this health care crisis (Wilson & Rosenberg, 2004),(Kirby, 2002), (Mazankowski, 2001), (Romanow, 2002), (SaskatchewanMinistryofHealth, 2001). Various measures introduced due to the debt reduction activities has impacted all associated with health care. Due to the increased pressure of financial constraint now Canada is rethinking to privatize the health care as in the U.S. If the Canadian health care is opened to market it is said that there would be less of rationing and competition would bring down the cost (Mazankowski, 2001), (Wilson & Rosenberg, 2004), (Romanow, 2002), (Coburn & Tobbance, 1998).

### 7.2.3 Prescription Drug & Medical technology Expenditure

In Canada the regulatory authority of prescription drugs and devices (comparable to the FDA in the U.S.) is called Health Canada (HealthCanada, 2014) . Unlike in the U.S. direct to consumer advertising is restricted in Canada (HealthCanada, 2014). In Canada the costs of prescription drugs are covered by private insurance. More than two third of the people have insurance and those who cannot afford an insurance are covered by certain schemes by the government (Refer chapter 3 section 3.2).

Canada is not a research hub for prescription drugs as compared to the U.S. Top ten pharmaceutical companies in this world are from the U.S. The price for prescription drug in the U.S. is 32% higher than in Canada (Feldstein, 2012). There are reasons for this price difference. According to (Feldstein, 2012) there are two costs involved in developing a drug, fixed cost and variable cost. Fixed cost involves research & development, experimental costs and cost for getting FDA approval. These developmental costs are very high regardless of which type of drug is produced. Once the chemical entities are determined the cost for producing the drugs (variable cost) are relatively small. Drug manufacturers in the U.S. try to add new users by selling the drugs to foreign countries since the variable cost of producing the drug is low. They try to sell the drugs in other countries at whatever price is possible there (given, for instance, national regulation and the purchasing power of the population) and try to make up for their profit by selling drugs at a high price in the home country. They make a profit in other countries like Canada since, even though Canadian regulation does not accept prices as high as in the U.S., the cost of drugs sold there is still higher than their variable cost (Feldstein, 2012).

#### a. Reasons for high Drug Prices in Canada

But Canada is also now facing the problem of high drug prices (Morgan.G, 2006), (Gagnon, 2015). A study has been conducted by University of British Columbia between 1996 and 2003 to know the real reason of the rising cost of drugs (Morgan.G, 2006) **[*Steven .G. Morgan who is an assistant professor at the Centre for Health Services and Policy Research, (CHSPR) is considered as an authority in pharmaceutical policy and economics]*** . According to his research, 1147 patented products (new drugs) were introduced into the Canadian market between 1990 and 2003 (Morgan.G, 2006), (Marchildon & Matteo, 2015). The study classifies the drugs into “breakthroughs, addition to a class providing little or no improvement, or line extensions by PMPRB (Patented Medicines Pricing Review Board) (Morgan.G, 2006), (Marchildon & Matteo, 2015). During this time period only 5.9% (68

drugs) were found to be ‘break-through products’ (Morgan.G, 2006), (Marchildon & Matteo, 2015). For the remaining 1005 products there was no evidence of any substantial improvement (Morgan.G, 2006), (Marchildon & Matteo, 2015). Some differed clinically from their older counter parts, although the improvement was minor. These drugs were termed “me-too” drugs by the researchers (Morgan.G, 2006), (Marchildon & Matteo, 2015). PMPRBs are more concerned with the safety of the drugs than its benefits when they give approval for introducing a drug in the market (Morgan.G, 2006), (Marchildon & Matteo, 2015).

Although at the time of their introduction the ‘me-too drugs’ provide just moderate or very little improvement (Morgan.G, 2006), (Marchildon & Matteo, 2015),they cost 2.5 times more than its older version (Morgan.G, 2006), (Marchildon & Matteo, 2015). ‘Me-too drugs’ account for 80% of the increase in expenditure (Morgan.G, 2006), (Marchildon & Matteo, 2015). According to the researchers, the limited additional value they provide cannot justify the increase in cost (Morgan.G, 2006), (Marchildon & Matteo, 2015). The ‘breakthrough’ category accounts for a relatively small portion of total spending, constituting just 10% in 2003 (Morgan.G, 2006), (Marchildon & Matteo, 2015).

In short, Canada is not a drug-manufacturing ‘hub’. Canada depends on the U.S. for its prescription drug supply. As explained above, most of these drugs are ‘me-too drugs’ whose cost are disproportionately high (Morgan.G, 2006), (Marchildon & Matteo, 2015). Even though direct-to-consumer advertising is prohibited in Canada, people are well-informed of the new medical technologies and prescription drugs from the U.S. cable channels available in Canada which is inducing needs in the minds of the people. (Law, Majumdar, & Soumerai, 2008) tried to assess the impact of direct-to-consumer advertising of prescription drugs in the United States on Canada for three heavily-marketed drugs − Etanercept, Mometasone, and Tegaserod − using a controlled quasi-experimental study using interrupted time series analysis. A representative sample of 2700 Canadians were considered (Law et al., 2008). The results show that there was an increase of 42% in prescription rates in the English-speaking region of Canada where people were exposed to advertisements in comparison to the French-speaking part of the country (the control group) (Law et al., 2008). The researchers conclude that U.S. ‘direct to consumer’ advertisements influenced the Canadians and increased their demand for the particular drug to whose advertisement they were exposed (Law et al., 2008). Also other studies have shown that because of the exposure to advertising, people have become more demanding and the prescriptions for those drugs which are heavily advertised

are increasing rapidly also. (Pharmacare, 2015), (B. Mintzes, 2006), (B Mintzes, Barer, Lexchin, & Bassett, 2005), (Morgan, 2005), (Morgan.G, 2004).

In Canada the capital requirements for the hospital whether it is the building expense or the expense incurred for buying a new technology is provided by provincial funding. Unlike in the U.S. the hospitals in Canada never engaged in a 'technology arms race'; due to government budgeting they have always been a slow adopter of medical technology. (Chapman, 1994), (Duncan & McKinstry, 1992), (Cohen et al., 1994), (Marchildon, 2014) ,(Robinson, 2008). Interestingly, even though Canada has been a slow adopter there has never been a report of any citizen suffering due to lack of availability of medical technology (Cohen et al., 1994),(Hall.R, 2013), (B. R. Deber, 2003).

Like prescription drugs, Canada is not an R&D hub for medical technology also. Like for prescription drugs, Canada depends on the U.S. for medical technology also and spends less [about 1% (Dewar, 2006) of the total health expenditure as compared to U.S which spend almost 11% (Statista., 2013) for medical technology R&D. Even though direct-to-consumer advertisement is prohibited in Canada, the U.S. keeps the world informed of all the medical technology developments and its proliferation (R. Deber, Thomson, & Leatt, 1988). This information exchange has contributed to rising health care expectations and subsequent expenditures in Canada (R. Deber et al., 1988). Even though Canadians are not as motivated as Americans in terms of medical technology it is difficult to make a medical technology which is introduced in the U.S. not to be introduced in Canada (For the same reasons [advertisements] mentioned in the case of prescription drugs. It is said that medical technology is the biggest influence Americans has on the Canadians (R. Deber et al., 1988), (Dewar, 2006).

U.S. medical technology companies are exporting 'me-too devices' to Canada (Dewar, 2006). Canada depends on the U.S. for medical devices as Canada does not have a R&D hub for itself (Dewar, 2006). During clinical trials the 'me-too devices' showed marginal benefits when compared to the existing devices. Nevertheless, they reach the market and are sold at high cost (Dewar, 2006). This is the reason for the recent increase in the medical technology cost in Canada. (Refer chapter 3, section 3.2.1).

For the Canadian citizens, since they are aware of the new technologies available in the U.S. market they feel that it is the government budgeting that is the reason for the non-availability of devices in the market and they feel that privatization of health care would give them relief

from rationing of health care. There is an increasing level of support for the privatization of health care in Canada.

As already mentioned, the health care system in each country has got its own uniqueness depending on the rules and regulations and political policies in that country. But support for the Canadian system, once heralded as one of the best in the world, is on the decline. The pressure to introduce competition as in the U.S. is high now. How it would affect the Canadian health care system is a matter to be investigated.

### 7.3 An overview of the Dutch health care system: A System in Transition

### The Dutch Insurance System

In the early half of the 19th Netherlands did not have a health care system as except for some sickness funds in the form of mutual fund by some charity organization, physicians, pharmacists and other private organizations (Schäfer.W et al., 2010). With the advent of industrial capitalism some new funds were established basically by the labour unions to take care of their employees (Schäfer.W et al., 2010). Employees were working under unsafe working conditions and they met with accidents (Verzekeringsbank, 2008). By the beginning of the 20th century government gradually got involved (Verzekeringsbank, 2008). In 1901 Accident Act was established (Verzekeringsbank, 2008). Accident Act 1901 ***(Ongevallenwet)*** is considered as the first step towards any kind of a social insurance system in Netherlands (Schäfer.W et al., 2010). This act gave workers the right to get monetary compensation for damage suffered due to their work related activities (Verzekeringsbank, 2008). This was mainly open to workers who were working with power tools, steam, gases or explosive and inflammable materials. There was no wage limit and all the workers working in these sectors were insured (Verzekeringsbank, 2008).

Until 1913, the insurance system in Netherlands was pretty much fragmented until government introduced the Sickness Fund Act 1913 ***(ziektewet).*** Even though the Sickness Fund Act was introduced in 1913, it could be implemented only in 1930 due to the political differences which existed about the introduction of the act. Sickness act only covered the sickness benefits and not any medical expenses. In 1941, the German occupiers came with the Sickness Fund Decree (1941) (Schäfer.W et al., 2010). The Sickness Fund Decree ensured compulsory insurance for people drawing salary below a particular level (Schäfer.W et al., 2010). The insurance was not only for the employees but also extended to their relatives (Schäfer.W et al., 2010). The employees and employers made equal contribution to

the fund. Later this was extended to self-employed as well as retired people but on a voluntary basis (Schäfer.W et al., 2010). Rest of the people relied on some kind of private insurance which they could afford (Schäfer.W et al., 2010).

In 1964, government passed a new Sickness Fund Act known as the Compulsory Health Insurance Act (Ziekenfondswet, ZFW). According to the Compulsory Health Insurance Act 1964 along with all the features of the sickness fund a compulsory amount should be paid (income related) against critical medical risk. In 1967, Exceptional Medical Expenses Act (AWBZ) was introduced. Its main aim was to cover extreme and catastrophic health incidents. Later Exceptional Medical Expenses Act was expanded to include psychiatric care, pharmaceutical care and rehabilitation care and home care services. In 1974, a white paper on the structure of health care ***(Structuurnota Gezondheidszorg)*** where the concern of health care cost and its accessibility to Dutch citizens was discussed. The solution proposed was an increasing influence by the government. But the proposal for an increased government influence and universal health insurance for all citizens was rejected due to difference in political opinions (Schäfer.W et al., 2010).

In 1987, the Dekker Plan, **(*Bereidheid tot Verandering)*** or 'Willingness to change' was an attempt to achieve the 'universal insurance' for all. Unlike the previous attempts this was more based on market principles. Despite the market terminology that is used, the Dutch health care system is not a market in the sense of a neoclassical 'free market', or even a market in the original meaning of the word (a place of buying and selling); rather, it is a heavily regulated system called ***managed competition*** – a system managed by the government in cooperation with insurance companies. In this managed competition, Dekker proposed that insurers would compete for people on one hand and on the other hand negotiate with health providers to avail their services at a lower cost. This idea was introduced in parliament as part of Simons Plan in 1992. But this plan could not get approval in the parliament and it failed to get implemented. Many other reforms and changes took place in the 1990's but nothing could achieve the goal of universal coverage for all Dutch citizens. In 2006, the Health Insurance Act **(Zorgverzekeringswet, Zvw),** came into force which was a revolution for the Dutch health care system (Schäfer.W et al., 2010).

In short, even though we use the word 'market' when we mention Dutch health care system, and call the patients are now called 'health care demanders', doctors or health care institutions are called 'health care suppliers' etc. it is not a typical neoclassical market where

suppliers and demanders meet and an equilibrium price is determined. There are many actors and how it works in reality is explained below.

### 7.3.1 Health Insurance Act (Zorgverzekeringswet, Zvw)

The Health Insurance Act 2006 had mainly 4 actors – government, Insurers, patients, health care providers. There were mainly 3 ‘markets’ (as explained below) which got established as part of this reform. The diagram indicating how the Dutch healthcare system is organized is given below:

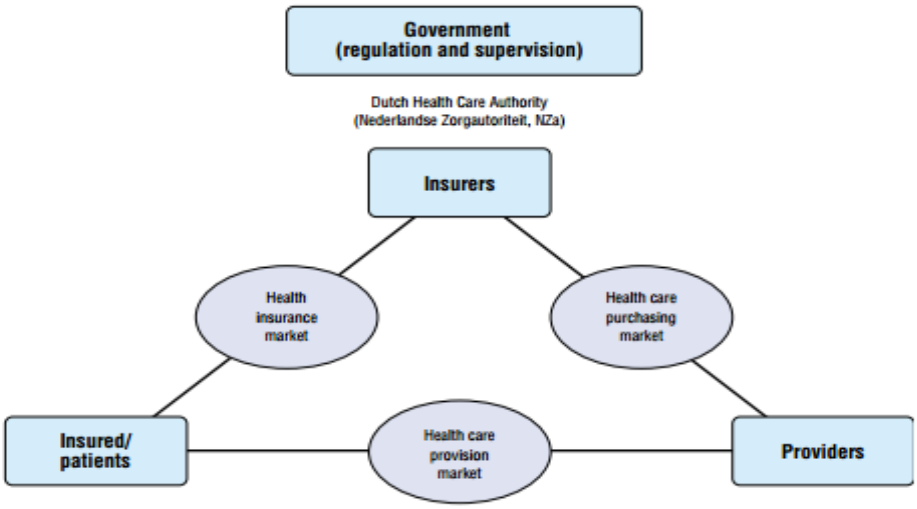



**Figure 18: Health care system – Netherlands**

Source: (Schäfer.W et al., 2010)

The government took its hands off from direct control and limited themselves to just ‘setting the rules of the market. Their role is just to oversee whether the markets are working properly. The main actors in the market are the insurance company, patients and providers of health care (Schäfer.W et al., 2010).

In the ‘health insurance market’, the insurers sell their insurance policies while the citizens are legally obliged to ‘buy’ an insurance. In the ‘health care purchasing market’, the insurance companies and providers meet and they negotiate on price, volume and quality care. The consumers of health care have no voice of any importance in this ‘market’. In the third market, the ‘health care provision market’, the providers provide care to the patients.

The essence of this system lies in the fact that citizens can choose an insurance provider who can offer the best policy at the least cost due to competition in the insurance market. On the other hand the health care providers have to provide service at the least cost and best quality

negotiating with the insurance company to get patients. It is assumed that these two competitions would bring down the cost of the health care system (Schäfer.W et al., 2010).

### 7.3.2 How the health care plan is organized

The Exceptional Medical Expense Act (AWBZ) remains the corner stone of Dutch Health insurance system now also. There are 3 compartment cares in AWBZ (Schäfer.W et al., 2010), (Daley & Gubb, 2013). The first compartment consist of a compulsory social insurance (SHI) focussing on long term care. The second compartment ensures basic package of health insurance to all citizens provided by the private health insurance market. Extra government schemes ensure universality (Schäfer.W et al., 2010), (Daley & Gubb, 2013). First a flat premium is paid by the people to the insurer (Schäfer.W et al., 2010), (Daley & Gubb, 2013). Second an income dependent employer contribution is deducted and transferred to the Health insurance Fund (Schäfer.W et al., 2010), (Daley & Gubb, 2013). The third consists of luxury care which is not mandatory. People can opt for it if they want additional care like dental procedures and physiotherapy (Schäfer.W et al., 2010), (Daley & Gubb, 2013).

Literature review reveals that it is too early to say whether the Dutch health care system is successful or not. But there is scepticism about certain features about the existing market model. The success of this system lies, as already mentioned in the competition between the insurance companies. Competition would ensure lower cost and consumers would choose the best policy with the least price. In reality the Dutch Insurance market gives a different picture (Lynch & Broek, 2010).

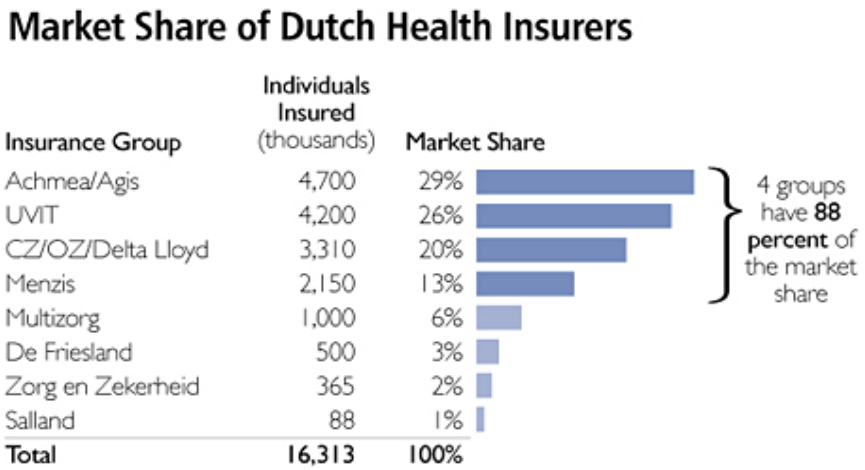



**Figure 19: Market share of Dutch Health Insurers**

**Source: (Lynch & Broek, 2010)**

The whole market share of the Dutch Insurance company is in the hands of 4 major companies (called 'players') – Achmea, UVIT, CZ group, and Menzis which share 88% of the total market (Lynch & Broek, 2010). 100% market share is in the hands of just 8 companies which shows that the Dutch Insurance Market is not in competition with many suppliers but is an oligopoly (Lynch & Broek, 2010). Even if there are some small players they would be acquired by the larger ones (Lynch & Broek, 2010). In 2006, when the managed competition was brought in Netherlands almost one fourth of the people changed their schemes since there were many companies and plans in existence. By 2009 only 3 per cent of the people switched their plans as the plans became more uniform as competition between companies reduced. Almost all the plans looked similar for the people. (Lynch & Broek, 2010).

Competition would be successful only under certain conditions. First, there would have to be adequate information available for the people. According to the Netherlands competition authority, information is lacking in the insurance sector (Lynch & Broek, 2010). Proper information about the quality of the care as well as about the insurance companies is lacking in the Netherlands (Lynch & Broek, 2010). Moreover consumers would change the schemes only if there is price differentiation between the schemes. In 2009, the Dutch nominal premium price difference was from 963 Euro to 1128 Euro (Lynch & Broek, 2010). In the insurance industry, only a substantial difference of 17 percentage in price ensures competition (Lynch & Broek, 2010). The HHI index of the Dutch Health Insurance industry was 2111 as of 2010 as compared to 780 during 1999-2003 (see Graph below), showing that concentration has increased substantially (Bikker & Leuvensteijn, 2008). This shows that managed competition has led to far lesser competition (Bikker & Leuvensteijn, 2008), (Lynch & Broek, 2010) .

**HHI Index: Dutch Health Insurance Industry**

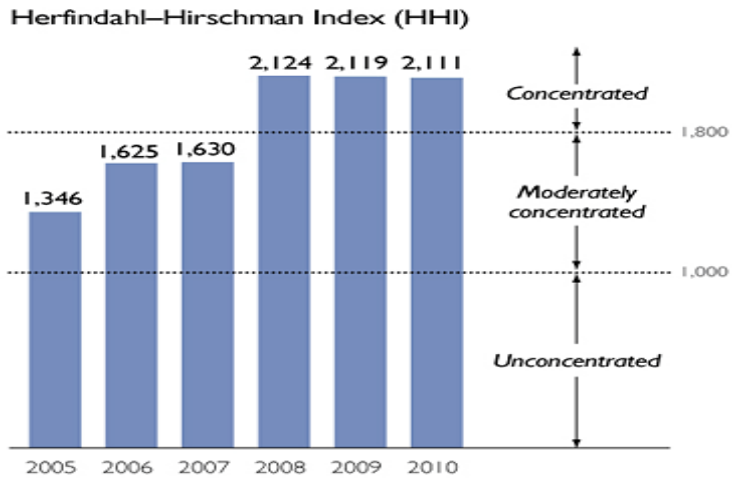



**Figure 20:HHI Index: Dutch Health Insurance Industry**

**Source: (Lynch & Broek, 2010)**

### 7.3.3 Hospital & Physician Care

90% of the hospitals in Netherlands is managed on a not-for-profit basis. The remaining 10% are public university hospitals. Specialist's cares are organized by the hospitals itself. They are paid fees based on DRG system, (Diagnosis & Treatment Combination). Hospitals are financed on the basis of a global budget. The National Health Tariffs Authority (CTF) monitor the setting of the annual budget of the hospitals. The budget is set on the basis of the expected costs.

All the citizens in Netherlands are registered with the General Practitioner (GP). GP acts as the gate keeper in the Dutch Health care system. Only 4% of the patients reach the hospitals from the GP. GP's are independent contractors. They are private practitioners.

### 7.3.4 Pharmaceutical & Medical Technology

Like FDA for United States, the regulatory authority for pharmaceuticals and medical technology in Netherlands is called RIVM (Rijksinstituut voor de Volksgezondheid en Milieuhygiëne) (Schäfer.W et al., 2010).

There are 3 types of pharmacies in Netherlands. Public, hospital and dispensing general practices (Schäfer.W et al., 2010). About one-third of the pharmacies are part of wholesalers which are part of chain. Statistics show that number of pharmacies are increasing and almost 68 pharmacies opened in 2007 (Schäfer.W et al., 2010). Traditional family-owned businesses

are closing down and new wholesale pharmacies are getting opened. In 1999, government liberalized the law even allowing non-pharmacists to open pharmacies. The Dutch community pharmacists have formed an organization called pharmaco-therapy consultation group who form relations with GP's and try to discuss about the treatments, products and also about the information policy that need to be accepted (Schäfer.W et al., 2010). They keep a strict policy of discouraging the industry representatives from influencing them. By study shows that 60% of the pharmacists and 40% of the GP's admit to meeting the industry representatives (Schäfer.W et al., 2010).

According to the pricing act introduced by the government the maximum price of pharmaceuticals is set based on the average prices of 4 countries (Germany, Belgium, France & United Kingdom) and prices are subject to price negotiations between the ministry and the producers (Schäfer.W et al., 2010). The insurance company also comes out with a list of preferred pharmaceuticals (Schäfer.W et al., 2010). Only those drugs belonging to this list is reimbursed (Schäfer.W et al., 2010). If the physician feels that his patient should have a drug belonging to a non-preferred list then he can write it on the prescription and it would be reimbursed.

Investment to be made for medical devices is the responsibility of the individual hospitals. Even though Netherlands has been a slow adopter of medical devices, a change in this trend is noticed (Gaillard, 2013). The medical technology expenditure in the country is increasing. For example, according to Ingeborg Gaillard the number of PET scans in the Netherlands is increasing. The Netherlands need only 9 PET scans (according to the population requirement) whereas 44 PET scanners have been installed (Gaillard, 2013). The reason pointed out by Gaillard is basically that hospitals are engaged in an arms race like in the U.S. to keep up with competition and this is affecting the over diffusion of technology (Gaillard, 2013). On the basis of interviews she found that the industry has an influence on the diffusion process. They help the early adopters with planning, organization and financing of research studies with respect to new technology. The hospitals allow this as they show their quality in terms of the new technology they poses. For the doctors, their prestige increases with their experience to use new technology. The main motive for the technology industry is identified as profit. (Gaillard, 2013). Negotiations between hospitals and industry as well as hospitals and insurance companies happen in a little transparent 'give and take' fashion. It does not involve the pre-set financial norms **(handjeklap)** (Gaillard, 2013)**.**

Since literature on the Dutch health care system is mostly in Dutch, it is hard for an English-speaking researcher to come to a conclusion on how it is performing. For this reason, I recommend that a detailed study of the performance of the Dutch health care system be performed by a Dutch-speaking candidate especially with regard to pharmaceutical industry as well as medical device industry.

Since not much information is available in English I have made a beginning with first-hand data collection. I conducted two pilot interviews with the aim of designing a questionnaire for doctors that could be used for a future study of the Dutch health care system. The questionnaire is attached in the appendix 3. The results of the interviews with 2 dentists in Netherlands are presented in Appendix 2.

The main aim of the interviews was to understand the relationship of the rising capital intensity on the practice of doctors in Netherlands. But the interviews helped to reveal more about the current state of Dutch health care system especially after the 2006 reforms. It helped to throw light into the role of government, insurance companies as well as the medical technology companies in organizing Dutch health care system.

### 7.4 Brief of the two Interviews

Like in the U.S. capital intensity is increasing in Dutch health care system also. As mentioned in the interviews by the dentists, (citing examples of 'Melag autoclave' and 'Chair') the government as part of their industrial policy is demanding dentists to meet specific capital requirements (medical devices) which are not really adding to the quality of the services. But unlike other countries the dentists in Netherlands faces a different challenge also. According to the dentists their services are regulated by the insurance companies supported by the government. Insurance companies are trying to standardize the treatments denying doctors' fees for consultation and also restricting the number of treatments they can do every day. Every year the insurance company is trying to bring down cost of the specific services. This is not adding to the quality of the treatment but only degrading the quality. For example if a patient is visiting the doctor to perform a certain procedure (eg: filling), and if the doctor discovers that his other tooth also has started decaying, as per the rules set by the insurance companies through the government the doctor is not supposed to treat both on the same day (even though medically it is allowed). The probability that the patient would visit him later taking a second appointment is less (since he cannot feel the pain now and the difficulty

involved in paying a second visit) which means that the second tooth would slowly degrade leading to a costly treatment in the later stage.

On the one hand the capital intensity requirements for the doctors are increasing and on the other hand the insurance companies are trying to limit their services as well as their charges. This leads to a situation where the doctors will have to group together (leading to oligopoly as seen in the U.S. system) or they will have to depend on other investors to continue their treatment which leads to a situation where profit maximization and not health maximization becomes the ultimate aim. Future research into Dutch health care system needs a careful analysis in this direction as we have already seen in the U.S. health care system how profit maximization rationality can affect the cost and quality of health care.

# 8. Conclusions, Reflections and Recommendations for Future Research

In this thesis I have explored the question whether turning health care into a market would lower the costs and improve the quality of health care, as is claimed by proponents of this idea.

To investigate how the introduction of a (neoclassical) market into health care could reduce costs, I first studied neoclassical theory; I identified important characteristics of the neoclassical 'free market' and how this model is applied to health care. Next, I studied the U.S. health care system because this is held by many to be a 'free-market'-based system. Nevertheless, the costs of health care in the U.S. are among the highest in the world. Is this due to the introduction of a 'free market' into U.S. health care, as critics of a neoclassical market-based health care system suggest? Or, on the contrary, is it because the U.S. health care system is, in fact, not (yet) a neoclassical market, but rather a system that is heavily regulated by the U.S. government, as is claimed by proponents of a 'free market' system in health care? To answer these questions I studied four sub-systems of the U.S. health care system: physicians, hospitals, the pharmaceutical industry, and medical technology industry. The conclusions of my study are presented in Section 8.1.

The results of my study raise a number of questions regarding the best way to organise health care and factors that policy analysts should consider while designing a health care system , because both a free-market-based and a regulation-based system proved to have serious disadvantages. In Section 8.2 I discuss an alternative proposed by philosopher Michael Walzer which, however, also raises some questions because of (in my view) possible inconsistencies or incompleteness. Moving beyond Walzer, I take some very preliminary steps towards what in my view could perhaps be a more encompassing solution. In Section 8.3, I present the contributions of my research and highlight some limitations. In Section 8.4, I recommend some suggestions for future research.

## 8.1 Conclusions

Conclusions are presented in two parts. In 8.1.1 conclusions regarding pharmaceutical products and medical technology are given. In 8.1.2 conclusions regarding physician and hospital services are presented.

### 8.1.1 Pharmaceutical Products & Medical Technology

The costs of medicines and medical technology in the U.S. are found to be high especially when compared to other OECD countries. I identified five factors contributing to the rising costs of medicines and medical devices, three of which are related to the neoclassical market model in which these industries operate and two related to regulation. The main 'neoclassical market' factor contributing to high prices is the patenting system which grants market power to pharmaceutical and medical technology producers which is then used to keep prices high. These high prices are justified with reference to the research and development that is undertaken and whose costs have to be recovered. However, as many studies suggest, the amount of R&D undertaken in these industries is less than expected and, with a view to the profits made in this industry, may not justify the high prices. Most of the R&D for medicines and medical technology is done in publicly-financed research programmes, while industry produces mainly drugs and devices that involve relatively little research (especially me too drugs). They are sold at very high prices (relative to their benefits as well as generic drugs). A second factor that keeps prices of medicines and medical technology up is 'direct-to-consumer advertising' which according to neoclassical health care economist Paul Feldstein is necessary to inform patients about cost, price and quality which will enable them to make informed choices; however, several studies show that advertising induces demand for the 'best' medicines and the newest technology and stimulates higher use of (the relatively expensive) medicines and treatments.

A third factor is lobbying which aims at strengthening market power and may thus contribute to higher prices. While patenting and advertising are accepted within neoclassical health care economics, whether lobbying is defendable from a neoclassical point of view is less clear. In a neoclassical market, the state, or regulation, would be minimal, so there would be little reason for lobbying to take place. However, within a 'maximisation of shareholder value' (MSV) framework – a modern version of profit maximisation which did not yet exist when neoclassical economics first emerged − lobbying would be acceptable as part of competition to increase shareholder value.

Authors pointing to non-market factors influencing the price of medicines and medical devices mention the regulatory body ensuring the safety of drugs and devices, the Food and Drug Administration (FDA), and the insurance system. The costs of the research procedures for testing the safety of drugs are charged to the industry wanting to sell the drug, and passed on to consumers via a higher price of the product. The insurance system, by covering the costs of medicines and treatment, creates a 'soft budget constraint' that supports the demand for medicines and (medical technology) treatments and in that sense does not contribute to lower health costs.

**Policy Implications & Recommendations**

As per my analysis of the pharmaceutical as well as medical technology industry I arrived at two important questions that I would like to raise here and should be considered by **policy analysts** in their attempt to design a health care system:

1. **The commercial development of knowledge** − If the true aim of the development of drugs and medical devices is to make health-promoting and life-saving drugs and devices available to people needing health care at the lowest possible cost and with reliable and precise information, and if commercial R&D leads to prices that many who are not insured cannot afford and, moreover, neglects diseases that affect many citizens in the world who do not have the ability to pay, would it not require research and development that is free from commercial pressure? Should the development of knowledge remain within the purview of the economy or should knowledge development be considered as a different sphere by itself?
2. **'Free market' versus state, or 'free-market state'?** − Is the way pharmaceutical and medical technology industries are organised actually neoclassical? Interestingly, when I started this thesis, I formulated my questions in terms of either 'market' or 'government-regulated'. During my research I discovered that in reality the two are intertwined to an extent that makes it difficult to differentiate between the two. Therefore, it is also not easy to say whether the health care system in place in the U.S. represents a neoclassical market model. It has neoclassical features, based as it is on, for instance, competition, profit-maximisation, the commercial development of knowledge, and the (meritocratic) acceptance of marginal productivity as the factor determining one's ability to pay. But advocates of a 'free market' in health care such as Feldstein and Kraemer point to the government as the source of high costs in health care because it is the government who

regulates and amends the law in response to demands by industry, insurance companies and health care managers. What comes into view is a state-market mix where market parties demand, on the one hand, freedom and on the other, laws and regulation that ensure profitable investment and market opportunities. In the literature, this particular intertwining of market and law & regulation is called neoliberalism (e.g. Peck & Tickell 2002), a system that has come into existence in the last thirty years. In contrast to neoclassical economics which is based on the idea of the 'free market' and *minimal* government, a system has emerged where industry and a (large and dominant) government are intertwined and where rules and regulation are bent by the government to support industry. Not only governments but also world organizations such as WTO and IMF are bending their rules and regulations in support of a 'free market' which however, in the neoliberal model, is not at all free from government regulation and direction.

### 8.1.2 Health Care Provided by Physicians & Hospitals

Analysis of the historical and present contexts in which physicians and hospitals have to operate in the U.S. has led to the identification of five major factors that contribute to higher costs of health care in these two 'sub-systems' of the U.S. health care system.

First, the introduction of neoclassical competition has led hospitals and doctors to engage in a 'technology arms race' − to attract patients who appreciate high-tech treatments – which has significantly raised health care costs, also because money (whether loans, bonds or shares) attracted to buy costly technology needs to be paid back (or yield a dividend), which pushes upward pressure on the number of treatments (to recover costs).

Second, a factor that has added to this 'technology arms race' is 'direct-to-consumer advertising' – permitted and promoted by neoclassical health care economics according to Paul Feldstein (2012) − which has increased patients' demand for medicines and treatments, particularly the more expensive medicines and high-tech treatments (which are presented in advertisements as superior to conventional treatments).

While both factors can be ascribed to the introduction of neoclassical principles (competition and advertising) in health care, they are also related to a third factor: the insurance system in place – arguably not a neoclassical factor (Jost, 2007). − That reimburses these medicines and treatments and keeps the level of treatments high.

A fourth factor is ‘managed care’ by Health Maintenance Organizations (HMOs) and (PPOs) which were introduced to increase competition between physicians and hospitals. However, in practice, HMOs turn out to be a monopsony leading to rent. (Refer section 5.3.3).

Fifth, attempts to reduce the costs (and increase profits of investors in) health care have led to the introduction of Taylorist ‘scientific management’ leading to standardisation (homogenisation in neoclassical terms) of health care services. Applied to health care, ‘scientific management’ has led to protocollisation and an increase in robotic surgery. According to critics, rather than reducing costs, both have until now substantially raised the cost of health care. Protocollisation has led to over-billing and over-treatment, while both the fixed and variable costs of robotic surgery are higher than those of conventional treatments.

**Policy Implications & Recommendations**

Through my analysis of the way health care by physicians and hospitals is organised in the U.S. I arrived at three further questions which should be considered by **policy analysts** in their attempt to organize a health care system:

1. **Standardisation and the quality of health care** − Can health care services which, by nature of differences between doctors and between patients, are not homogeneous, be standardised without loss of the quality of health care? Evidence suggest that standardization can work for manufacturing but when introduced in health care it can lead to inflated bills, more tests, deskilling of doctors, and automation bias and automation complacency in health care. (Refer section: 4.5).
2. **Is health care a good? –** Is health care a good that can be traded like any other good? The goal of neoclassical economics is to maximise the goods available to people, or to maximise consumption. The underlying philosophy is that people’s wants are without limits. Another idea is that economic growth is best served if each producer maximises profits. But is growth the goal of health care? Or is the goal better described as meeting needs – which arguable are not without limits? In neoclassical economics, the idea of satisfaction does not exist. The consumer is never satisfied; more is better. If we apply this principle to health care, does this not contradict the nature of health care which is to treat people until they have restored their health (rather than to maximise consumption of medicine, medical devices and doctor visits). Does applying the neoclassical model in health care not run into an internal contradiction between, on the one hand, efforts to

reduce costs in health care, and on the other, and attempts to use health care as an engine of economic growth?

3. **How to spend financial resources in health care? –** There exists widespread concern that the costs of health care are too high. With reference to historical developments in manufacturing where, over time, costs have been significantly reduced by economising on labour, efforts aiming at reducing costs in health care are directed at reducing hours of work (by doctors, nurses etc.). Overall, however, the costs of health care do not decline. What we see, rather, is a shift of resources (i.e. the money that is channelled towards health care via insurance premia and taxation) away from treatment of patients by doctors and other therapists towards treatments in which medicine and technology play an increasingly important role. (Refer Chapter 3 where the cost factors are identified and per capita expenditure on drugs and medical technology for the three countries are given which shows an increasing trend). This raises the question to what extent, in the choice of treatment − a decision which is increasingly centralised through protocollisation − industrial policy also plays a role. If there is a tension between, on the one hand, optimal treatment for patients, and on the other, policies to support industrial development, how to solve this tension in a way that neither harms the patient nor precludes economic development?

Answering the five questions raised above requires, in my view, a rethinking of how a health care system is best designed. By way of a very first step, I discuss below an alternative proposed by U.S. philosopher Michael Walzer. Although this raises some interesting viewpoints, in my view it also leaves some questions, which I take up next.

## 8.2 Alternative Solution

### 8.2.1 Michael Walzer's Spheres of Justice

At this juncture it is very interesting to look into the proposal put forward by Michael Walzer. According to Michael Walzer each good has its own intrinsic value which makes it very distinct. Based on its social value, each good belongs to a specific sphere of society; their respective distribution must be based on the values they pose. He gives examples of regular as well as non- regular goods. Regular goods are like books, cars etc. which can be traded through the market. There are other non-regular goods that should not be considered as a good that can be traded in the market; examples he presents include education and health care. How is the distribution of or access to these goods be determined?

If you are rich you can buy a car. If you are not rich you do not need to buy a car. You can travel from one place to another using public transport. But health care is not like that. It does not matter whether you are rich or not but each individual has the right to sustain one's life and health irrespective of one's capacity to afford health care.

According to Walzer, the best way to ensure this kind of health care is through a government-controlled delivery system. Another principle that Walter emphasises is that of autonomy of the distributive sphere. In his view, goods like money and power should not be allowed to have dominance over the sphere of goods like education and health service and the autonomy of these spheres should be maintained. Health care should be a separate sphere by itself where there is access for all and the autonomy of this sphere should be maintained.

### 8.2.2 A more encompassing solution?

I like to differ with Walzer at two places. One is his proposal for a fully government-regulated system in health care. In the U.S. as we have seen, and as recent literature on neoliberalism also suggests, today it is hard to distinguish between state and market because the two are so intertwined. Also in Canada, which used to have a fully government-controlled system which kept the economy at a distance and guaranteed access to health care for all, demands from the economy are increasingly taken into account in the design of the health care system through changes in laws and regulation (e.g. the abolishment of a law forbidding direct-to-consumer advertising). (Refer chapter 6).

On the other hand Walzer mentions that regular goods can be sold in the market. But he does not define clearly what he means by a market. When Walzer accepts the 'justice of the market' as a separate sphere of justice, it appears by 'market' he means 'neoclassical market', a market organised according to neoclassical principles such as competition and profit-maximisation. But if competition, profit maximisation and maximisation of consumption (unlimited wants) are accepted as the basis of the economic order (in the market), how can 'economic imperialism' – the 'colonisation' of other spheres by the economy – be avoided? How to protect the autonomy of each sphere if there is at least one sphere that knows of no limits?

As noted by, for instance, investment consultants, there is a 'superabundance' of financial capital in this world that is seeking for new investment opportunities because opportunities in the economy are limited and financial instruments are risky. Health care is considered as a safe new investment option which could generate high returns provided it is reorganised in

ways that reduce costs and maximise profits (section 4.6.1). Walzer fails to look into this phenomenon; he emphasises the autonomy of each sphere and points out that one sphere (for example, money and power) should not be allowed to dominate others; but he fails to explain how to set boundaries on each sphere so that it will not 'colonise' others. How could a dominance of money and power could be avoided? How to place boundaries around the economy as well as the state to keep them into their proper place?

At this juncture I would like to propose to think about a third sphere – in addition to government (or the sphere of democracy and parliaments where laws and regulations are made) and market – where knowledge can develop freely, that is, free from interventions by the state as well as from demands coming from the market. This would include the development of knowledge about health and about what patients need to restore health. Autonomy in this sphere would ensure that the development of medicines and the direction that medical technology takes are tuned to the needs of patients, and that standardisation and protocols are developed where they serve a useful function but would not 'crowd out' doctors and not hinder them in treating their patients and in developing the knowledge and experience they need to build up in order to be good doctors.

I wonder whether a health care system could be designed based on his thinking if it does not explain how the tendency towards domination of both state and market could be curbed or avoided. Therefore, I think the idea of 'sphere autonomy' and how it can be ensured requires more thinking. Is autonomy of each sphere reconcilable with theories (economic or otherwise) that do not put boundaries on expansion?

At this point, this may sound like a plan that is not easy to realise (which, perhaps, shows how strong the demands coming from other spheres are and how necessary it therefore is!) However, as David Graeber (2015) has mentioned in his paper, the system as we know it today did not come overnight with a blue-print of the system already in place. It slowly evolved over time. But each change, however slow, starts with an idea. I think it is high time we think outside the market as well as the government and think of an alternative system that can ensure social welfare.

### 8.3 Contributions and Limitations

In this thesis I have explored the question whether 'turning health care into a market' would lower the costs and improve the quality of health care, as is claimed by proponents of this idea. The thesis presents theoretical as well as empirical evidence to analyse whether the

rising cost of health care in the U.S. is due to the application of the neoclassical market model in health care, or to government regulation. The contribution of this thesis is that it studies a problem − the rising costs as well as questions regarding the quality of health care − experienced in many countries, and by many governments in the world. Many governments are now embarking on a path taking the U.S. health care system as an example. Understanding whether the U.S. system really helps to bring down the cost is therefore very important.

However, there are several limitations to my research. First, answering my research question requires in-depth understanding of neoclassical economics and how it is applied to re-design health care systems. With a technical background with only limited knowledge of economics this is not an easy job. Although I have tried my best to understand neoclassical economics, I apologize in advance for any errors in interpretation.

Second, while data regarding the costs of health care are available in many (though not all) cases, the quality of health care is hard to measure. While some data on the quality of health care are available, they raise questions as to how 'quality' is operationalized. Indeed, the concept of quality raises many questions theoretically as well as empirically. For example, when health care given by doctors is standardised (automated or robotised), to what extent is this an efficiency improvement and what, if anything, is lost in the process? Till today, only a few researchers have taken interest in and also written on such questions. This takes me to the next limitation.

Fourth, in this thesis I have chosen to concentrate on the overall picture – an analysis of the health care system as a whole, including the pharmaceutical industry, medical technology industry, and the work field of doctors and hospitals. Although this gives a rather complete picture of a health care system, there are many questions for which more in-depth study would be required.

Fifth, due to time constraints an extensive study of the Canadian could not be done, while the analysis of the Dutch health care system is also limited due to lack of availability of literature in English. In order to compensate at least partly for this gap I developed a questionnaire that could be used to study the impact of changes in the health care system on doctors. I have used the questionnaire in the Netherlands both to get more information on the Dutch health care system, and to test it out so that it can, perhaps, be used for further study. However, I have been able to do only a very limited number of interviews and even though the interviews have

yielded some interesting information, my account of the Dutch health care system is far from complete.

Finally, based on my findings of drawbacks of both 'free-market'-based and state regulation-based health care systems, I have formulated a number of questions which, to my mind, require further research. Although very briefly, I have discussed philosopher Michael Walzer who offers an interesting perspective in which he distinguishes different spheres in society which in his view should have autonomy. However, a limitation of his thinking, in my view, is that even though he emphasises the importance of the autonomy of each sphere, he does not explain how the tendency towards domination of both state and market could be curbed or avoided. Therefore I have raised some questions regarding Walzer's work and given a suggestion for how it could be extended or developed further. However, I have not had sufficient time to explore this idea further.

I would therefore like to conclude this thesis with some suggestions for future research.

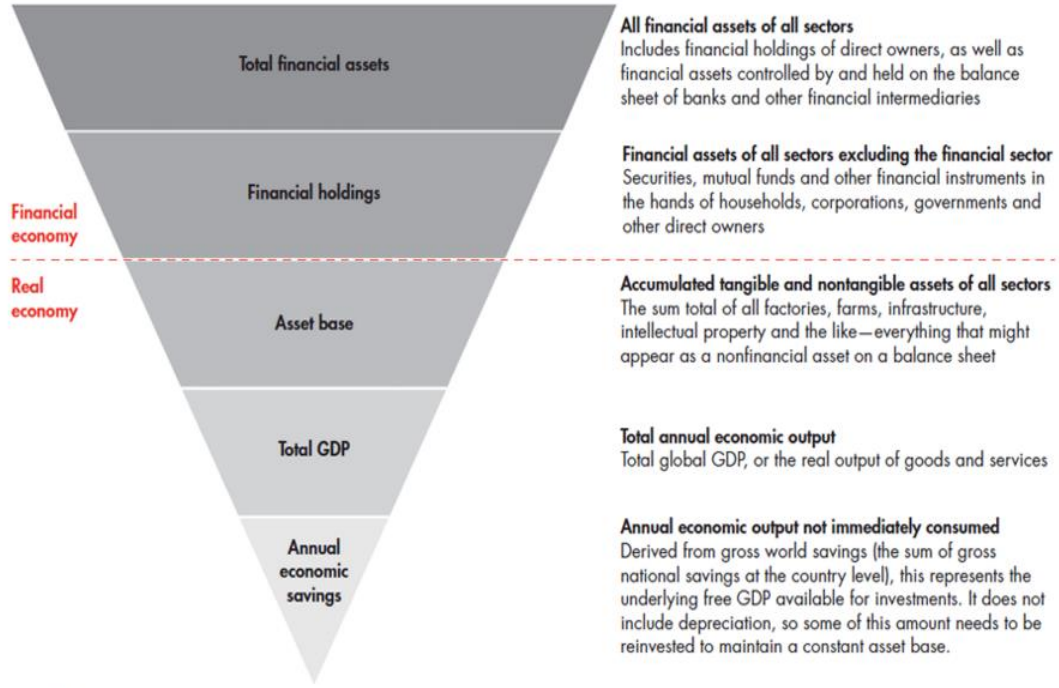
### 8.4 Suggestions for Future Research

1. Study the impact on the costs and quality of Dutch health care of the 2006 reforms, using the questionnaire which I developed, to find out how the 2006 reforms work out for doctors and for the costs and quality of health care they can provide.

2. Design an alternative to the patent system – if patenting leaves significant number of people without access to medicines and medical treatment, what would be an alternative system that would ensure knowledge development also for groups in society who in the current system cannot afford health care?

3. Explore the theoretical foundations of a new system that would ensure access to health care for all.

# Appendix 1: Description of financial assets




Source: Bain & Company

## Appendix 2: Results of pilot interviews:

The interviews were conducted with Dr. abc (name undisclosed) and Dr. xyz (name undisclosed) at their dentistry units. Interview with them helped to get an insight into how the reforms of 2006 are affecting their practices especially the influence of government, insurance companies and the medical technology industry. The main focus of the interview was to know about the increasing capital intensity and its effect on their practice.

The main points are explained below.

Dr. xyz is an independent practitioner and his team consists of 3 nurses to assist him, 1 secretary and one manager to take care of his finances. He handles almost 1650 clients annually.

According to Dr.xyz, Government is bringing in new rules and regulations that is making it difficult for dentists to continue their practice in Netherlands. Most of the rules are to support the insurance companies and medical technology industry to make profit. The insurance company decides what charge and what treatments could be done through the government. For example, insurance companies do not reimburse for combination treatments. Less treatments means less reimbursement to be made by the insurance companies and thus more profit for them. Medically there is no harm in filling a gap in your tooth and at the same time if the client has pain in his other tooth consulting or treating that. But according to the 'rules' laid down by the insurance companies as well as the government, the dentist is not supposed to treat both at the same time. If he is doing the filling, only that procedure would be reimbursed by the insurance company but not for the consultation [They check the dates on which the bills are produced]. The patient has to come on a different date. When the patient finds the difficulty in travelling again mostly he would avoid that. The only actor who is benefiting from this is the insurance company. Healthcare is a profession that requires a lot of consulting and talking. Different patients would appear to have the same problem, but due to different reasons. When the dentist is doing the filling he would be able to see the upcoming of a new problem in the other tooth. Consulting about that and treating that problem is not allowed by law. Actually many bigger treatments in the later stage could be prevented if it is treated or taken care at an early stage. This is not allowed by the insurance company. According to Dr.xyz, dentists or doctors are not only for doing 'procedures'. Dentistry involves a lot of consulting, advising, and even training the patients. None of these activities are counted by the insurance company and none of these activities are reimbursed also.

To continue a practice meeting all the capital requirements, it is very difficult for a dentist these days because of these restrictions. Only procedures can be quantified and priced. It is not possible to quantify the consultation you do or the advice you give the patients or even the enquiries you make to them to know the real cause. If this system continues, to maintain the practice dentists would be forced to do unnecessary procedures even though if it is not required for the patient at that point of time to meet the financial requirements. The 2006 reforms have only helped the insurance companies and not the citizens as well as the doctors. Every year the government is bringing new restrictions in the form of new rules which is making it difficult for the dentists to continue the practice. For example there is plan for the government to bring in a new rule which says that people from so and so post code can only consult with a particular dentist. As of now there is no restriction for any dentist to start his practice [as told by Dr.xyz]. This new rule would reduce the supply of the dentists on one hand and on the other hand with the new restrictions put forward by the insurance company the number of practices and treatments would also be restricted. Only people who would be benefitted would be the insurance companies. Every year the cost of each treatment is also brought down. The cost of filling a gap is now 40 euros. There is plan to bring it down further next year.

Another challenge the dentists face in Netherlands is the capital intensity requirements laid down by the government especially in case of sterilization. Earlier all the devices were bought by the dentists according to his own desires (When asked about whether competition forced him to buy any devices he told that he does not face competition and he bought all the devices according to his desire which he felt would improve the quality of his service). If he felt that a particular device would bring better quality he would buy it. Now the government is coming up with specific requirements in terms of capital requirement. For example Dr. xyz has been using a method of sterilization that has been universally accepted and used by dentists all over the world. It is called the 'Melag autoclave'. It was working well also. It had ultrasound and chemical fluid cleansing attached to it. The government said that all should start using the product of 'Miele' which was considered as a standard by the government. To replace 'Melag' with 'Miele' it costs him 6000 euros. None of these are reimbursed by the government or any specific provision is provided by the government. The government sets certain rules this year. The next year these rules are again changed. Filling materials are usually filled in a syringe and then used. The same syringe can be used for at least 15 patients. Now the government has come up with new rules saying that syringe used for one patient cannot be reused. On the one side they bring in all these requirements and on the other

side they are bringing down the cost of the procedures. Even though it is not evident outside, it seems the industries are getting an upper hand in determining health care in Netherlands. Even the toothpastes that is in the market is not safe. It is always shown that more lather means more cleanliness. Advertisements of tooth paste propagate this message (As told by Dr.xyz DTCA for medicines and medical devices are not allowed in Netherlands. Dentists get information from Universities, organization for post graduate dentistry, KNMT etc). The truth is that lather is produced by sodium lauryl sulphate that makes bubble. Sodium lauryl sulphate in any quantity is harmful to the body especially for the digestive system. They also have plastic content in them. The regulatory authorities say that if the content of plastic or sodium lauryl sulphate is above say 2% only, the company needs to inform the consumers. The fact is that any amount of sodium lauryl sulphate is bad for health.

There are two organizations in Netherlands for Dentists. Dr. xyz told that he is part of KNMT. They always promise that they would talk to the government and insurance as well as technology industry with regard to cost and compensations. But none of these things happen. All the organizations are actually hijacked by the various industries. Always new rules would come as if it looks like it is to support the health care providers. But usually 'it is old wine in new sack'. There has been constant request by the dentists in Netherlands to KNMT to have discussion with the government on how the reimbursement of dentistry is organized by the insurance companies. There has never been any move by the organization. Insurance companies are just trying to standardize the health care profession. Only those treatments laid down in their rule book would they reimburse. There is no incentive for the dentists to educate his patients which would help prevent so many major problems in the future.

Dr. xyz wants to change his 'chair' that he uses for treating his patients. As per government requirement he should buy a chair that can sterilize water above 60 degree Celsius that can kill the 'ligunalabacteria' which is also a new requirement by the government. The chair would cost 40,000 euros. With all the government restrictions and standardizations imposed by insurance companies it is difficult to meet such huge financial requirements. According to Dr.xyz, to continue practice with all these restrictions put forward by the insurance companies and meet the changing capital requirements put forward by the government the dentists should either move to group practice or take the help of private investors who are willing to invest in health care. According to Dr.xyz, he feels that if dentists have to work under investors, then making maximum profit would be the goal of the practice and this

would lead to conflict of interest with the goal of the practitioner which is the health of his patients.

Dr. abc has been practising since 1974 as an independent practitioner. He has 2 surgery rooms and a staff strength of 4 people. He handles almost 1700 patients every year. Unlike Dr. xyz, Dr. abc is thinking of stopping all contracts with insurance companies. He told that a group of dentists decided to continue their practice disregarding the insurance company. The patients have to pay upfront at his practice. He would produce them the bill. If they want they can get it reimbursed from the insurance company by themselves. Most of his patients visit him due to the personal relationship developed between him and the patients. So he feels that collecting money upfront from the patients would not matter. He feels that the whole health care is organized according to what the insurance companies and the medical technology industry want it. If a dentist wants to take out a tooth he has to give anaesthesia. According to the rules laid down by the insurance company he can only get reimbursed for the procedure and not for the anaesthesia used. He also told that combination treatments are not allowed by the insurance companies. If a patient has to undergo gum treatment (periodontics treatment) as a doctor he would need to do the complete check-up of the gum. The insurance companies would not reimburse for the check-ups. They say that both the treatments could not be done on the same day. The bills would not be reimbursed by the insurance companies. According to Dr. abc government is asking health providers to spend a lot on sterilization. Syringes and even dispensing machines have to be changed periodically. If you take out a glouse for writing something it cannot be reused. He feels that all these hygiene requirements by the government is just a waste of money. Being in practice for more than 30 years his experience have taught him what is good for his patients. But this sudden imposition of rules on the hygiene and sterilization side is just to help the industry to sell their products and nobody else is benefiting. With all these requirements from the government and restrictions imposed by the insurance company it is not feasible to continue the practice in a financially feasible manner. He is also part of KNMT. He also feels that the organization is not representing the dentists properly or talking for them. It has not been able to take up the issue the dentists face due to the insurance companies and their standardization methods.

Dr.abc wants to modernize his practice as he faces competition from other dentists around him. For modernizing the practice he needs to buy new devices. For example he wants to invest in a radiology equipment giving 3D imaging of the entire facial structure. The machine is out in the U.S. market. He came to know about the device from the advertisements in the

U.S. health care magazines he buys. The machine would cost 30 k euros. He said that the machine would give detailed image of the face which gives high value for the patients also. But for him to buy this machine he has to move to group practice or depend on investors. He also raised the concern on depending on investors as their objective would be different from his. When asked about the safety features of the machine since it uses x-ray radiations [I explained to him about how FDA approves the devices in the U.S. based on the research I conducted] he said he has not thought about it and does not have any idea about its safety features. Since it is FDA approved he assumes the machine is safe even though he raised scepticism on the safety regarding radiations from the machine.

Dutch health care system underwent a major reform in 2006. It is a system which is still undergoing changes. According to the literature review conducted on Dutch health care system it is too early to get into a conclusion. No extensive literature (in English) on exactly what is happening in the Dutch health care is available. Most of them are vague assumptions also. It would be better to do an extensive study on the Dutch health care system by interviewing more GP's and specialists [questionnaire attached in the appendix] to have a clear view and see the role of government, insurance company, medical technology industry and pharmaceutical company and see whether the 'managed competition' is helping in bringing down cost.

# Appendix 3: INTERVIEW QUESTIONS:

### A. Your practice

1. How long have you been a health care practitioner (HCP)?
2. Are you working as an independent HCP (in your own practice)?
3. Since when do you have your own practice?
4. Is it your own practice or a joint practice (with other dentists)?
5. How many co-workers do you employ?
6. How many clients does your HC unit serve? How does this compare to the size of the average HC unit?
7. How many clients do you need to be able to break even in terms of costs?

### B. Capital intensity

8. Have you faced difficulties over the years to manage your practice in financial terms?
9. What is the size of physical capital (excluding buildings) per patient?
10. What kind of financial investments (for physical capital, safety etc.) have you had to make in the last 20 years?
11. Has the capital-intensity of your practice increased / decreased / remained equal?
12. Who decides on the capital-intensity of your practice? Is it your own decision?
13. What is the role Government or insurance companies played with regard to the investments you had to make last couple of years?
14. If investments in physical capital stock in your practice have increased or decreased, what is the reason?
15. What is the replacement rate (or rate of depreciation) of the technologies you are currently using? Has the replacement rate / depreciation rate increased or decreased over the past thirty years or stayed the same?
16. Do you decide the replacement rate? If not, who? If the replacement rate has changed, by how much has this raised or reduced the cost of your practice (taking into account possible revenues from sale of the older technology)?
17. How do you fund your investments? Is it through loans/mortgages? What about the cost of debts?

### C. Impact on cost and quality of dental care

18. In your view, have the investments contributed in improving the quality of the care you could give to patients? Would it be possible to give a quantitative estimate of the effect (in relation to the extra costs made)?
19. In your view, have the investments contributed to reducing the cost of health care (to the dentist)? By how much?
20. Have they contributed to making dental care more affordable to the client?

### D. Dutch dental care − general

21. If you are experiencing financial problems in maintaining your practice, do you think they are unique to your practice? Or are they shared by other dentists?
22. How do practitioners manage to break even?
23. Who are the regulatory authorities in Dutch dental care?
24. With respect to the capital intensity of dental practices, what is the role of (a) the government, (b) insurance companies, (c) medical industry?

25. Which have been the most important measures / changes in regulation affecting the capital intensity of your practice over the past 20 years?
26. What is the view of regulatory authority A/B/C on the relationship between investment in physical capital and (a) the cost of dental care and (b) the quality of dental care?
27. What is the view of the Dutch dentists' association, the *Koninklijke Nederlandse Maatschappij tot Bevordering van de Tandheelkunde* (KNMT) on the capital intensity of dental care?
28. What is the view of the KNMT on the relationship between investment in physical capital and (a) the cost of dental care and (b) the quality of dental care?
29. Has the KNMT come up with recommendations?

**E. Dutch dental care – the future**

30. What would be your ideal dental care practice in terms of basic equipment, costs, personnel?
31. In your view, what would be the best way to organise dental care financially?

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