Priceless medicine

How can the prices of patented medicines be lowered?

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ABSTRACT

This research answers the question how the prices of patented medicines can be lowered in Europe. An interdisciplinary approach is used to answer this complex question. Both economic and social sciences are used to get a more comprehensive understanding. This studies showed that the prices of medicines should be made public to enhance price-negotiations. But to enhance the lowering of prices, the patient's decision is an important factor to accomplish this. When the patient is involved in the decision-making regarding medication, it is possible to let the patients make a more informed and rational decision.

Utrecht University,
6 Juli, 2016

Introduction

Effective, patented medicines: cure at any price

Sovoldi is a new, highly effective medicine that cures hepatitis C (an infectious disease affecting the liver function). The medicine was introduced to the USA market in December 2013, and to the EU market shortly afterwards. The pharmaceutical company Gilead was the only company providing this medicine at the time of its introduction. This monopolistic position allowed them to set an initial price of nearly 84,000 USD per treatment, or 1,000 USD per pill. Only in 2014, the revenue Sovoldi generated by selling Sovoldi amounted to estimated 9 billion USD.

Meanwhile, the high price of Sovoldi in comparison to its estimated production costs (1,50 USD, excluding development costs) led to price negotiations between Gilead and the public Health Care departments of several EU countries. While European health insurance companies were awaiting the outcome of the negotiations – which only in The Netherlands lasted for almost two years – they were hesitant to reimburse the medicine, and only the severest cases could be treated.

While the negotiations with Sovoldi led to a breakthrough in September 2015 (now all Dutch health insurance companies cover Sovoldi), this case is exemplary of a worldwide issue: pharmaceutical companies that introduce new, highly effective medicines to the market have a monopolistic position for the first period after market introduction. This allows them to set relatively high prices in comparison to the development and production costs, which – generally speaking – makes effective medication less available for patients, and which makes patients highly dependent upon negotiation outcomes between the pharmaceutical industries, public health care departments, and health insurance companies (Volkskrant, 2016).

Negative consequences for society of high price setting of patented medicines

The power that pharmaceutical companies have in pricing patented medicines upon market introduction – caused by their monopolistic position and leading to high prices – leads to numerous negative consequences for society.

First, patients do not receive an optimal treatment, which generally causes a decrease in their health and quality of life, and which can lower their life expectancy. For instance, only in the Netherlands, several hundreds of patients die each year due to Hepatitis C, and on a global scale, an estimated amount of 350,000 patients die annually (the Guardian, 2015).

Second, public health care costs rise as a consequence of high price setting by pharmaceutical monopolists. The effect can either be direct (more expensive medicines

lead to higher the public health care costs) or indirect: when expensive medication is too expensive to be provided at a large scale, patients do not cure as fast as they could. This extends the duration of their illness and of their treatment, thereby increasing public health care costs. Especially in the light of the rapidly aging population in most European countries, and continuously rising health care costs, increasing health care costs as a result of high pricing of patented medicines poses a problem for the health care sector and national governments all around the EU (Ministerie van Volksgezondheid, Welzijn en Sport, 2012).

Third, high price setting of pharmaceutical companies causes social turmoil, and negatively influences the general sense of trust in the medical and pharmaceutical sector. For instance, in the case of Sovoldi, Gilead's price policy sparked demonstrations in many cities, from Barcelona to Melbourne and New York.

Research question and aim of the paper

Given the negative societal consequences of high pricing of patented medicines upon market introduction, the aim of this research is to unravel the factors that determine the current price level of medicines. To reach this, the following research question is answered in this paper:

> *"How can insights from economics and social sciences be used to lower the prices patented medicines in Europe?"*

In the subsequent section, the relevance of applying insights from economics and social sciences to the question of medicine pricing is explained.

On top of academic insights into the factors that determine the price level (explained more elaborately below), this research aims to provide policy recommendations for national governments and for the public health care sector regarding strategies that can help lower the prices of patented medicines set by the pharmaceutical industry in Europe.

How economics and social sciences can explain the price setting of medicines

Interdisciplinary approach to the issue of price setting

This research takes an interdisciplinary approach, meaning that insights from different fields of academia (particularly: economics and social sciences) are applied to formulate an answer to the research question. According to Repko (2004), interdisciplinarity can be used to answer a complex question often related to an unsolved societal problem. The question how the prices of patented medicines can be lowered, is a complex question, which cannot be explained by economics alone. The prices are dependent on the price policy of the pharmaceutical companies. The consumers, who pay for the medicines, also influence these prices. Who exactly pays for these medicines differs per country, but in most cases it is either the consumer or the health insurance company. The complex interaction between the different actors - the pharmaceutical companies, the insurance, the doctor, and the patient – calls for an interdisciplinary approach.

Price setting is primarily an economic issue, as prices in any market are highly dependent on the market situation, i.e. on supply and demand, as well as on production

costs. One of the main focuses of economics is to study which factors influence the pricing of goods. The level of innovative drugs, the mechanism of a monopoly and triangle of the health insurance, doctor and patient will be discussed further in depth. In this paper, the following questions are answered, in order to explain the price of patented drugs in economic terms:

1. *"Which key economic factors have an influence on the price of drugs?"*
2. *"How are prices determined from different points of view: the consumer, the country and the pharmaceutical industries?"*

However, research shows that macroeconomic factors, such as the national welfare level or the production quantity, do not sufficiently explain the pricing of medicines (Volkskrant, 2016; NRC, 2016). For instance, a comparison between Germany and the Netherlands shows that - despite macroeconomic similarities between both countries and a similar market situation - the price of a large quantity of different medicines differed substantially between the two countries (Volkskrant, 2016).

The pricing of medicines does not only depend on the supply side (production and development costs, market position) but also on the demand side. Some patented medicines are unique, in the sense that no comparable medicine can reach a similar effect. However, in many cases cheaper, effective alternatives are brought to the market ('close substitutes'). If patients choose these close substitutes on a large scale, this can affect the market position of the expensive, patented medicine, and thereby its price. Whether patients are willing to choose close substitutes, and whether doctors are inclined to subscribe them, depends largely on their **interaction.** Therefore, insights from **social sciences** – and more particularly patient-doctor interaction - can help explain the decision-making process of patients when it comes to their medication. Concepts such as information control (Árnason, & Hjörleifsson, 2016), patient-centeredness (Britten, & Maguire, 2015) and social dilemma (Valentinov, & Chatalova, 2016) will be discussed. The following two research questions are key to this paper's section on the social science approach:

1. *"Which social factors determine how patients choose their medication?"*
2. *"How can the doctors and patients be stimulated to choose cheaper or other alternatives?"*

In our research, we first look into economics and social sciences in depth. Afterwards, the insights are integrated to gain a more comprehensive understanding of how medicine prices can be lowered. Finally, we bring about a set of policy recommendations as well as recommendations for future research, and we address the limitations of this research,

Further remarks on the research scope

In this research, the terms medicines, drugs and medication are used as synonyms, and whenever each one of these terms is used, it refers to patented drugs that have been introduced recently to the European market.

This research will focus on the pricing of patented drugs, which are only provided by one firm, Especially in these cases high pricing of medicines is an issue, since the monopoly position of pharmaceutical companies implies that there is competition between firms that drives down the prices.

In our research we will focus on the continent Europe. Most countries in Europe have a developed insurance system and are considered developed countries themselves. Furthermore Europe has similar trades when it concerns pricing of medicines, but at the same time they differ enough to make a comparison between the countries. Tackling the issue on a global scale goes beyond the scope and aim of this research.

This paper includes insights from economics and social sciences, thereby excluding some other approaches that could be taken. For instance, ethics could be included in this research. answering ethical questions of such as whether medication should be available for everybody or not, and whether governments are responsible for this. However, it cannot explain how current prices can be lowered and is therefore not included in this research.

Mechanisms involving research and development costs of drugs can also be important when explaining the price of drugs. However, studies (source) show that research and development costs (R&D) have little influence on the final price of the drug. This research will therefore not regard the relationship between development costs and final price in great detail.

Last, an important aspect is the influence of the government on pricing, for instance when negotiating with pharmaceutical suppliers, as in the case of Sovoldi. This could be covered by a business discipline. While this is an important issue, it will be incorporated in this paper's sections on economics and social science, making a separate chapter on government influence redundant.

Economics

1. Introduction: economic theory applied to the case of medicine pricing

Prices of drugs are a topic of discussion in several newspapers today. Both NRC and Volkskrant (Volkskrant, 2016; NRC, 2016) reported that prices of drugs are high compared to their production costs. This section of the paper discusses which economic factors influence the price of patented medicines. Subsequently, the paper analyzes how insights from economics can be applied to explain the price of patented medicine and how it can give direction to strategies that can help lower the prices.

First, characteristics of the healthcare market and the pharmaceutical industry are described that help understand how the price setting of medicines occurs.
Afterwards, we look further into which economic aspects influence the prices of drugs, from the perspective of the producer and its market position. Subsequently, we address which government regulations are currently in place in Europe to control prices of medicines. Different models of price regulation by governments are presented.

Last, the information presented about the pharmaceutical industry and the insights applied from the field of economics lead to policy recommendations of how to lower the prices of patented medicines.

2. Characteristics of the healthcare market and pharmaceutical industry

2.1 Moral hazard arises in European healthcare systems

In most European countries, pharmaceutical companies sell patented medicines in a market in which the user neither chooses his medication nor pays for his medication directly. Instead, a doctor subscribes the medication and – in most European countries – the health insurance company covers the costs (and patients pay a fixed amount to the insurance company). Since patients do not pay the (full) price of their medication, they are likely to have a higher willingness-to-pay and choose the most expensive alternative compared to if they had to pay the full price – a so-called 'moral hazard' Felder, S. (2004).

2.2 Principal-agent relationship between doctor and patient

Another important observation which can be made, is the relation between the doctor and the patient. In this relation, the patient greatly depends on the doctor's advice and suggested treatment. Although the doctor has the best interest, he will still be influenced by other parties. A pharmaceutical firm will try to sell or promote its medication by offering the doctor either research money or other extra's. This may have the result that the (financial) interest of the patient and the doctor do not align(Berndt, Ernst R., et al., 2000).

2.3 Price discrimination between countries: beneficial to pharmaceutical companies
Furthermore, since countries have different price regulation systems (to be discussed later on) and different levels of welfare, price discrimination is likely to arise. If price discrimination is in play, consumers are divided into different groups (in this case: countries), and different prices are charged to each group for the same medication. Price discrimination between countries allows the manufacturer to sell medication at a high price in a wealthy country– boosting the company's revenue – while selling the medication at a lower price in a less wealthy country - boosting sales and lowering average fixed costs (i.e. R&D costs) Felder, S. (2004).

2.4 Parallel trading – as a strategy to overcome price discrimination – comes with risks
Countries can avoid price discrimination through parallel trading. In this case, a country buys medicines from another country in which the prices are lower. This is possible within the EU due to its free internal trade market. However, parallel trading comes with some downsides. First, a pharmaceutical company can prevent parallel trading by differentiating its products (i.e. different package sizes, or applying different dosage of the working substance).

The main reason for countries not to engage in parallel trading, is that reselling is risky, or at least perceived as such (e.g. medicines can be counterfeits) (Bale, 1998).

3. Economic factors determining pricing of medicines – the producer's perspective as a monopolist

3.1 Uniform pricing under moral hazard
In a normal monopoly situation with uniform pricing, profit is being maximized, and production continues as long as the marginal revenue (the price) is higher than the marginal costs. This allows producers to earn as much money as they can. However, monopolists normally face an 'allocation inefficiency' – or an output gap – meaning that not all consumers are willing to pay for a product with a price higher than the marginal costs. The healthcare market functions differently in the sense that moral hazard comes into play: consumers have a higher willingness-to-pay since a higher price has little or no direct financial consequences for consumers. This influences the demand curve.
Figure 1 shows the effect of moral hazard in this situation:

- Moral hazard is implemented in the graph as a subsidy (l) on the price of the drugs, and the health insurance company pays lp amount per unit of the drugs.
- The demand curve p(q) shows demand without moral hazard and (1+l)p(q) shows demand with moral hazard.
- q* represents the output if there were no moral hazard, and q^m shows the new output with moral hazard in place.

As displayed in the graph, a market situation with moral hazard comes with a lower quantity (q) of produced goods and a higher price. This illustrates that moral hazard – in this graph implemented as a subsidy on the price of the medicine –has a negative effect on the total produce medicine and the prices (Felder, 2004).

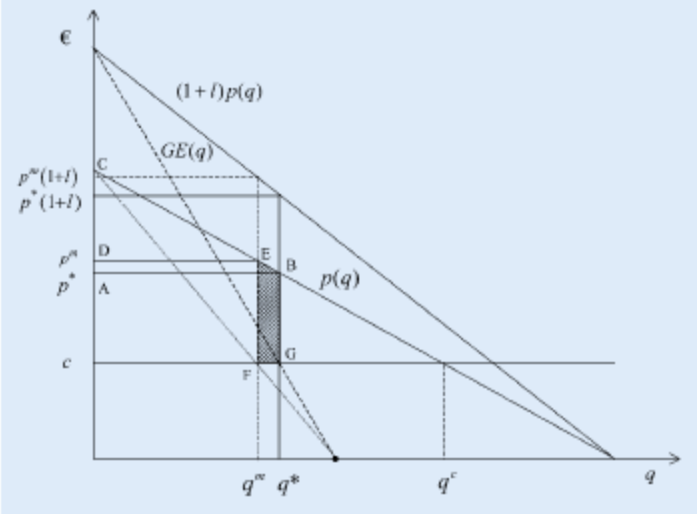


Figure 1 Uniform pricing under moral hazard(Felder, 2004)

As a final remark, it is worth mentioning that – due to price discrimination between countries – the extent to which moral hazard influences the market differs between countries. Higher prices are set in wealthier countries – i.e. the difference between marginal cost and marginal revenue increases – allowing for a larger influence of moral hazard on the production quantity and the price (Felder, 2004).

3.2 Innovativeness of the medication

In order to replicate the construction of the prices of medicines, a few important indicators can be observed. First of all, the level of innovativeness of the drugs is important. According to Lu and Comanor (1998), the innovativeness of the drugs influences the pricing strategy of a pharmaceutical company.

If a new patented medication is brought to the market which already has close substitutes, a 'penetration' pricing strategy will be used. At first, the new medicine is given a low introductory price, as buyers do not yet know the drug and its quality. In order to encourage them to buy this new medication, prices are lower compared to the existing alternatives. When buyers get familiar with the medication and reputation has been built, prices of this medication are increased. Prices increase most rapidly within the first four years upon market introduction, after which they will remain relatively steady.

Another strategy which can be used, skimming pricing, will occur when the new patented medication has significant benefits over already existing drugs. This strategy shows that high prices are set when the medication is being introduced. This strategy is often applied when a new cure to a disease is introduced, that could not be cured (well) before. Another situation in which producers apply skimming pricing is when the new patented medication has significant benefits over existing alternatives. Consumers are willing to pay the higher prices at first, though prices are likely to decline over time (Lu, & Comanor, 1998).

Another observation done by Lu and Comanor (1998), is that the premium earned over the medication itself depends on the target group. Medication for chronic diseases will have a lower premium compared to the medicines treating acute diseases. A possible explanation is that medication for chronic diseases is sold more frequently

and thus generates a constant flow of income. Moreover, given the long duration of the treatment, the price of medication for chronic illnesses is a more important factor influencing the choice for medication. Therefore, setting a more competitive price is more important. Medication for acute diseases, on the contrary, are only sold for a short period of time and have a less income certainty for the pharmaceutical company, leading them to set higher prices.

4. Breaking down government price regulations using Porter's model

4.1 Medicines as merit goods, with governments attempting to control the price

In a regular market, the price of a product depends on its demand. However, the market to which patented medicines are introduced is different. On the demand side, three parties are involved in buying the medicine: the doctor, the patient and the health insurance company or institute (either privately or publicly organized). The doctor diagnoses the patient and suggests which medicine is most appropriate, and patients usually abide to this advice. Relevant in this case is that the good is not paid for by the direct consumer (the patient) nor by the advising party (the doctor) but by a third-party payer: the insurance company: because of this, we consider medicines in this paper a merit good (Kapstein, & Busby 2010) .

Although medicines are merit goods, the pharmaceutical industry still wants to maximize its profit. Due to a monopoly position, and the high willingness-to-pay of the consumer, monopoly rent can be earned. Monopoly rent is profit that firms can earn due to the fact that they are the only sellers in the market and subsequently can raise the price without the fear of losing market share.

In order to control the prices, countries have introduced price regulation schemes. Especially during times of economic crises, countries try to restrain the prices of medicine, which can also be seen in figure 2. In 2008 during the crisis, countries paid more attention to the prices, which resulted in lower healthcare spending. These schemes entail a negotiation process between the government and the pharmaceutical company, which has to be completed as a condition for market introduction. To establish its stance in the negotiation – i.e. to define a reasonable price– governments can apply various models, which can be categorized using Porter's competitive business model. This model assumes that, in general, prices of a good can be based on three factors: its costs, available references (the prices of comparable goods sold elsewhere) or its value (also called 'performance') (Grattini, Curto, & Freemantle, 2016).

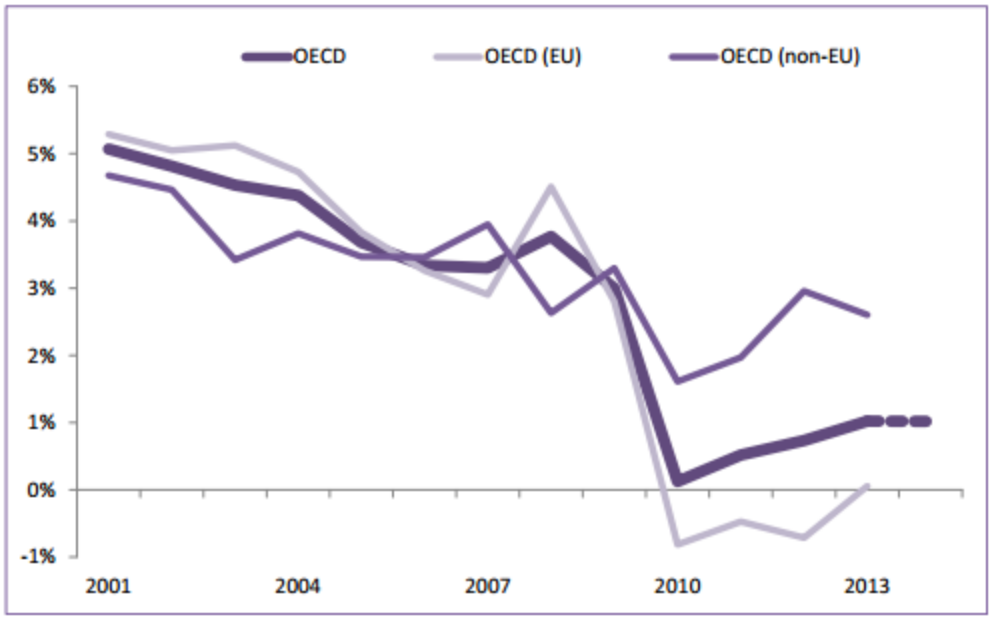


Figure 2 Average annual growth in per capita health spending, in real terms(OCD health statistics, 2015)

4.2 Cost-based pricing of medicines

With cost-based pricing, the price of the medicines is based on estimated production costs, such as manufacturing costs and Research & Development. This way of pricing was regularly used by countries in the south of Europe such as Italy and Spain. However, due to the difficulties of estimating the production costs of medicines produced by multinational pharmaceuticals – caused by the unequal information position of governments and companies- this approach is not used anymore.

4.3 Reference-based pricing of medicines

Another way to regulate prices is through reference-based pricing. Medicines which are considered a close substitute are categorized in one group, for which a maximum price is set. An advantage of this way of pricing is that it discourages pharmaceutical companies to develop a medicine with low therapeutic added value and sell it for a high price. A disadvantage, however, is that it can be difficult to categorize a new innovative medicine in a certain group (Grattini, et al, 2016). Therefore, for new medicines such as Sovoldi (mentioned in the introduction), reference-based pricing is not an exhaustive solution.

The Netherlands – along with most other EU countries (see figure X) belongs to the group of countries that use reference-based price regulation. A wholesale price is set for group of medicines. However, the pharmacies are free to negotiate themselves. Every six months these prices are re-evaluated, taking into account the prices of medicines in reference countries and fluctuation of the exchange rate (Ruggeri, & Nolte, 2014).

4.4 Value-based pricing of medicines

A rather new way of pricing medicines is based on the value of the product. For instance, the success rate of a certain medication in treating patients can be taken into account, or the likelihood of severe negative side-effects. The price of medicine is based on a model

that determines the value. Although this way of pricing can work well for medication that has already been on the market for some time, difficulties arise when a new innovative medicine is introduced. The value of this medicine (such as its success rate or likelihood and severity of side-effects) has not been proven on a large scale, and has to be based on clinical trials, estimates and assumptions (Grattini et al., 2016). This allows manufacturers to present their medicines in a more favorable way, thereby raising its estimated price (Claxton et al., 2008).

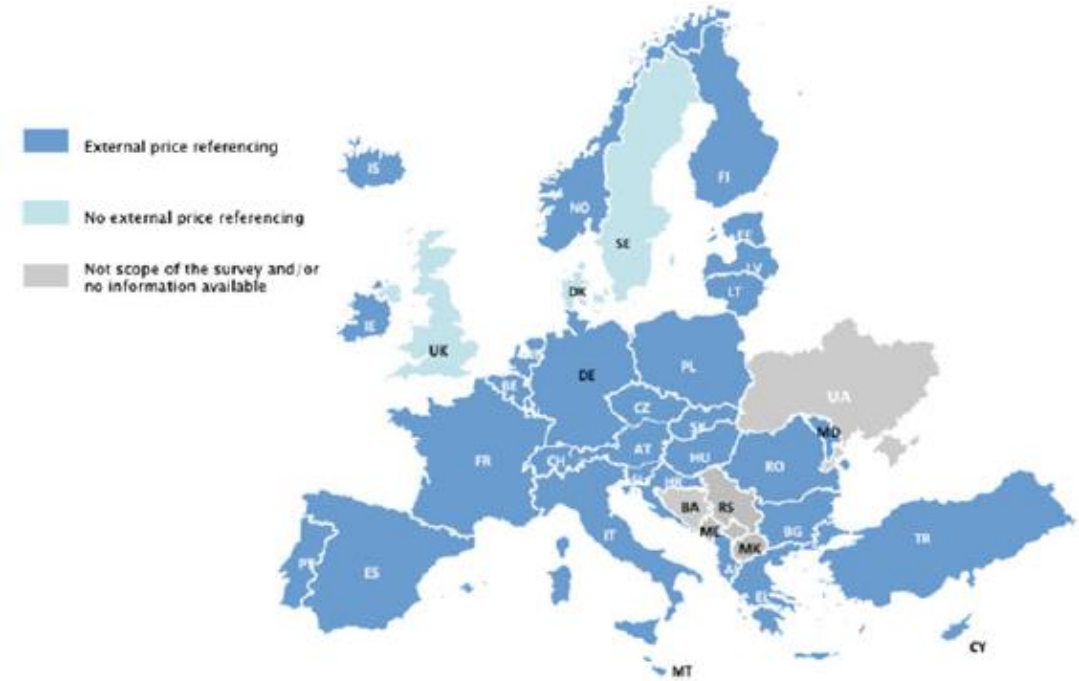


Figure 3 European mapping of discounts and rebates granted to public payers in 2001 (Vogler 2002).

4.5 Price transparency as a way to improve government's negotiation position

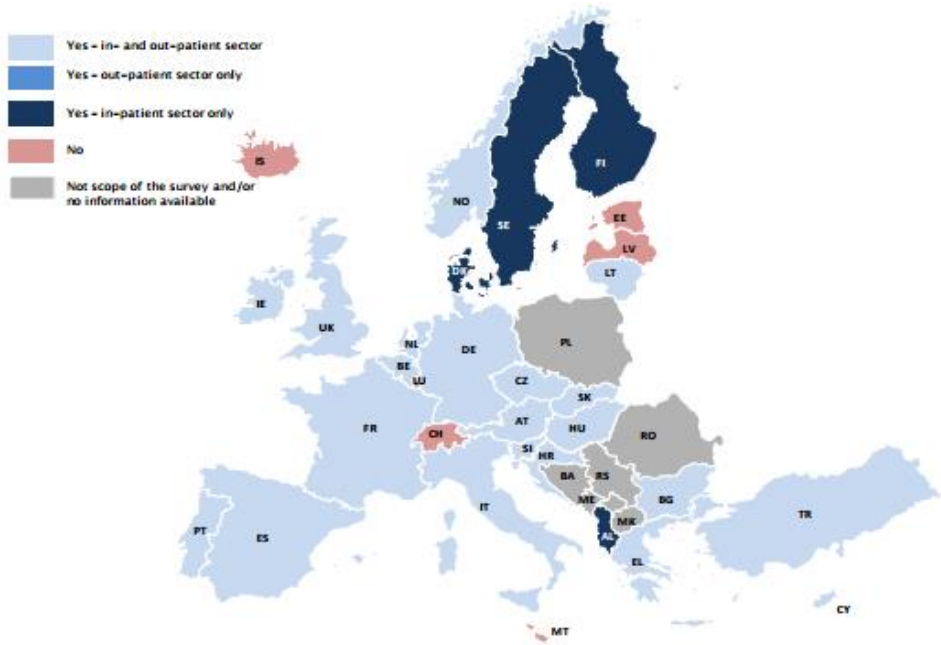
As stated above, countries apply different pricing schemes. However, the outcome of negotiations between governments and pharmaceutical suppliers is not published. Figure 3 shows that most countries negotiate with pharmaceuticals about price cuts, using different types of discounts.

The first type of discount is a price reduction on specific medicines from individual negations, leading to price cuts of up to 50%. A second type is a price reduction covered by laws or regulation which can – on average – generate a price cut up to 32.5%. The third and last type of price reduction is through sales volume in which up to 8% discount can be negotiated.

Although a price reduction does have positive outcome in the sense that less money has to be paid for the medication, it also causes a situation in which it is unclear what the actual prices in different countries are, since countries are not allowed to share this information. This is a reason why prices in different countries are different. Another disadvantage of this way of negation is that prices of medicines are difficult to compare

between countries, since up to 50% discount can be achieved (Vogler, Zimmermann, Piesnegger, & Bucsics, 2012).

If countries were forced to share information regarding the current and past prices of medicines, this could be advantageous for other countries in future negotiations. Countries would have the ability to compare the actual prices they pay with prices paid in countries with a similar level of welfare. This can help governments lower the prices of medicines in the future (Mrazek, 2002). Such information sharing could for instance take place within the context of the EU.



Country abbreviations: AL = Albania, AT = Austria, BA = Bosnia and Herzegovina, BE = Belgium, BG = Bulgaria, CH = Switzerland, CY = Cyprus, CZ = Czech Republic, DK = Denmark, DE = Germany, EE = Estonia, EL = Greece, ES = Spain, FI = Finland, FR = France, HR = Croatia, HU = Hungary, IE = Ireland, IS = Iceland, IT = Italy, LT = Lithuania, LU = Luxemburg, LV = Latvia, ME = Montenegro, MK = Macedonia, MT = Malta, NL = Netherlands, NO = Norway, PL = Poland, PT = Portugal, RO = Romania, RS = Serbia, SE = Sweden, SI = Slovenia, SK = Slovakia, TR = Turkey, UK = United Kingdom

Figure 4 European mapping of discounts and rebates granted to public payers in 2001 (Vogler et al., 2012)

5. Conclusion

There are several possible ways to show how the price of patented medication is determined or influenced. These prices can be viewed from different perspectives: consumer's point of view, the government point of view and the pharmaceutical industry. In general it is important to notice that the pharmaceutical industry mainly consists out of companies with a monopoly status, but also that consumers influences the prices due to moral hazard and a higher willingness to pay.

If prices are determined using a monopoly situation - price optimization with main factors are demand and costs - healthcare induces moral hazard and an increased willingness-to-pay. This drives up the prices of the patented medication.

Prices will exceed the 'normal monopoly situation' in which the price is set at the point where marginal revenue equals marginal costs. Due to the existence of price discrimination between different countries, even higher prices are being paid in wealthier countries, because of moral hazard.

The government tries to regulate prices of medicines based on Porter's model, based on either value, reference, or costs.

If patented medicines have a close substitute, it can be restrained by the government of a country by setting a maximum price. This price will be based on either already existing drugs with almost the same therapeutic value or how much the medication is valued or how much they costs to produce.

Most of the governments set medication prices based on close substitutes, however there value added based pricing is increasingly gaining popularity.

Although pricing of medicines with close substitutes work rather well, all of these have difficulties pricing new innovative patented medication. Reference pricing will be difficult due to the missing close substitute, value based pricing will be difficult because the exact therapeutic value is still unknown and cost pricing is hard because it is difficult to find the exact Research and Development costs.

The lack of price transparency has also a major effect on the prices of patented medication. Governments are sometimes able to negotiate a discount of 50% with the pharmaceutical firm. However, due to the forced secrecy, countries have no idea how much other countries are paying. Countries with the same welfare can end up paying a whole different price.

Pharmaceutical firms base its price on the innovativeness of the patented drug. If a new type of medication is introduced with a close substitute, a penetration pricing will be used to gain access to the market and build a reputation. In the long run, the price of the medication will rise above its substitutes.

If a new patented medication enters the market without a close substitute, the price of this type of medication will be set through a skimming strategy. The price of this type of medicine will decline in the long run.

Lastly, the type of disease which the medicine cures, will affect the price. Medicines used for treating chronic diseases will have a lower premium compared to the medication used for treating acute diseases.

6. Recommendation

In order to cut the prices of medication, a few recommendations can be suggested. The price of patented medication is drastically influenced by the monopoly status of the pharmaceutical company, the moral hazard and high willingness to pay of the consumer and the lack of transparency of prices among countries.

The fact that the pharmaceutical company has a monopoly status and price is being maximized instead of output cannot be changed. However, moral hazard which raises the price of medication should be reduced in order to lower prices.

Furthermore, due to the mandatory secrecy among price negotiation, it is very difficult to know what prices are actually paid for the medicines. Countries do not know what prices others are paying which may lead to different prices for countries with the same welfare.

If countries would be forced to disclose both historical prices and actual prices, countries could compare themselves with a country with similar welfare. Following this reasoning, it could be an option to regulate prices of patented medication on a greater scale. Instead of negotiating prices per country, Europe could negotiate prices as a continent. For this, a model could be developed which takes into account several factors of a country, for example its welfare.

Social sciences

1. Introduction

When consumers buy a product, they can often choose between different brands to make the best decision. They compare the alternatives, and decide based on quality, price, and numerous other factors, such as culture. In some cases consumers are willing to pay more for a product than for a similar product. When they are willing to pay more for a product, the seller can decide to increase their prices. This consumer behaviour is a classical and economic theory. This economic perspective has its limitations because behaviour is more complex than this (Elster, 1989).

Patients, who have to buy medicines, can be seen as consumers buying products. One reason that may explain why the prices are currently higher than expected, might be due to the fact that patients are willing to pay more for their medicines. Can this willingness to overpay for medicine been understood from the rational decision making process of consumer behaviour? When the mechanisms are understood why patients are prepared to pay more, it is possible to plan and change their behaviour. The main objective to decrease the high price of patented medicines in Europe is solved from a sociological and psychological point of view. First the sub-question: "What social factors can determine the medical decision making process of a patient choosing medicines?" is answered. The decisions that patients make will influence the demand, and therefore also the price. After the decision making process is known, it is possible to influence the patient to make a cheaper decision. This will be answered in the second question: "How can patients be influenced to choose a cheaper alternative?" Last, the paper provides a summary of the main results and answers the main question. The results and methods will be critically analysed.

2. Decision making process

To comprehend patients' decision making process when it comes to medicines, it is necessary to look at the factors that might influence a patient's decision. In the following sections, several of these factors will be illustrated. The most important factors that influences the decision making are: the doctor-patient relationship, culture, price, and insurance coverage. More insight in the factors that influence patient decision making can help to find ways to influence this decision making, and thereby eventually also the price setting of patented medicines. For instance, if patients were to choose more often for cheaper medicines, this might lower the prices of patented medication.

2.1.Doctor-patient relationship

Patients that are affected by an illness, have to make difficult decisions regarding medicines. Even when different medicines can treat the same illness, they all come with a different effectiveness, side effects and risks. Luckily, the physician helps the patient to make an informed decision –ideally made independently by the patient, based on personal preferences. If patients

are normal consumers of goods we can assume that they are well-informed, calculating, rational, dispassionate and reflexive agents, making them independent. However, patients cannot always be considered rational consumers, due to the asymmetric relationship between the physician and the patients (Noerreslet, Jemec, & Traulsen (2009).

First it is important to realize that a patient has health issues. In some cases, this may affect their ability to pursue their goals. Because the doctor has the task to help the patient to improve their ability to pursue the goals, he has to reveal the functional impairment of the patient. The doctor can reveal this by listening to the narrative of the patient, and he is than able to improve the patient's well-being. When the functional impairment is known, it is time to find a suitable treatment for the patient. The doctor provides the patient with enough information to make an informed decision on his or her treatment. If the doctor provides too much information this might be counter-productive, because when the patient has to choose which medicine to take an information overload will impair the patient's decision making capacity. The doctor is in control of the information and the situation; this creates asymmetry in the doctor-patient relationship. A solution for the doctor-patient asymmetry is the patient-centred approach (Árnason, & Hjörleifsson, 2016). This patient-centred approach will help to respect the patient's goals, values and concerns by listening to the patient's narrative; but it will also help to restore the asymmetry in the doctor-patient relationship.

According to Britten and Maguire (2015), patient-centeredness consists of the following interactive components between the doctor and patient:

1. both explore the disease and the illness experience
2. understand the patient as a whole person
3. find common ground
4. incorporate prevention and health promotion in the treatment
5. enhance the patient-doctor relationship by creating trust
6. the doctor is realistic about the illness, the treatment and its effects

The patient-centred approach can increase the trust that patients have in their doctor. This approach will also divide the responsibility between the doctor and patient, and it will reduce the uncertainty of the patient. It is important to note that not all patients will prefer a patient-centred approach in all situations. Some patient prefer a more distant relationship with their doctor.

A study on patients with Atopic Dermatitis confirms the preference of most patients for a patient-centred approach (Noerreslet et al, 2009). Physicians who had not taken the problems of the patients as serious as the patient was expecting, or who did not engage sufficiently in dialog, are being criticized by the patients. A lack of patient-centeredness can negatively affect a patient's trust in his or her physician, and can lead to scepticism in the competency of specific physicians.

Another important notion part of patient-centeredness is shared decision-making. According to shared decision-making, at least two participants – physician and patient - should be involved; both parties share information and take steps to build a consensus about the preferred treatment. Eventually an agreement is reached on the treatment to implement (Britten, & Maguire, 2015).

If doctors take a more patient-centred approach, this will lead to a sharing of responsibility. According to the patients in the study of Noerreslet et al (2009), the physician is responsible for making a 'correct' diagnosis and for prescribing the best alternative for treatment. The patients themselves are responsible to provide the correct information for the physician to make an informed decision, and to manage the illness according to the agreed plans of treatment. When the specialist did not took any responsibility, the patients felt that they "had" to take responsibility.

Although patient-centeredness is a widely known and accepted term, it is not widely applied (Britten, & Maguire, 2015).

2.2. Alternative medicines

If a patient does not trust the prescribed medicine, the patient may decide to postpone the treatment or may not take the required dose. A patient can also ask for an alternative treatment if this is possible (Noerreslet et al, 2009). These alternatives can for instance be a generic, homeopathic, or from another brand. A generic medicine is bioequivalent to the brand-named, but is more cost-effective (Skaltsas, & Vasileiou, 2015). Despite that a generic is as effective as the patented drug, and they possess the same risks, patients seem to prefer to use the patented drug. In this part the reasons for not choosing a generic are being explained. The use of alternatives such as homeopathy are neglected because the effectiveness cannot be compared with patented medicines.

In study of Skaltas and Vasileiou (2015) the belief that generics are safe to use was divided: 33% agreed, 21% disagreed, and 29% neither agreed nor disagreed. When considering the effectiveness of generics, 40% thought that generics are as effective as the branded, but 24,5% disagreed. The patients were also divided concerning the side effect of generics. Almost all the patients agreed that generics are cheaper than the branded drugs. The main reasons for not using generics are the lack of trust in them, and that patients did not know what generics are. However, patients are willing to substitute their medicines with a generic when the doctor advises this.

However, people are not always willing to substitute their medicines with generics. Even when people know what generics are, have positive experiences with them, and know that they are equal in quality than brand name medicine; they are less likely to use generics for chronic and serious conditions. When the illness was perceived to be more serious, the belief that generics are efficient and able to relief symptoms decreased. An explanation can be that the more serious or risky a consumer believe the medical condition is, the less likely he or she is to be willing to accept a generic to treat the condition. Another explanation is that the participants consider inexpensive drugs to be inferior and therefore less appropriate to treat more serious conditions (Figueiras, Cortes, Marcelino, & Weinman, 2010). A study done in Europe also shows that health services should prioritize people in the highest “need”. This “need” is related to severity of the illness, worsening health and life threatening illnesses (Exel, Baker, Mason, Donaldson, & Brouwer, 2015).

Culture can also influence the perception individuals hold towards medicines and alternatives. A study has been done amongst British students and students who identified themselves with an Asian origin. The students with an Asian origin had a more negative view about medicines in general than the students with a European origin. The Asian students also believed that medicines are more harmful, addictive poisons, and should not be used for a long period of time. They also believed that medicines are less beneficial for health. The students with an Asian origin did use less medicines than the European students, which can partly explain their negative attitude. The differences between the groups could not merely be explained by the experience with medicines, but has to be cultural (Horne et al., 2004).

2.3. Insurance

The inhabitants of Europe do not pay directly for their medicines because they are insured or the government pays for health care. However, if people collectively use less medicines or use cheaper medicines, this will make health care cheaper. If indeed health care becomes cheaper, the society will benefit from this by paying lower premiums.

According to the study of Exel et al. (2015), the opinion in Europe is that health care resources should be distributed aimed at equal treatment. Despite this egalitarian viewpoint, individuals are not always willing to pay for the health care of others. A Dutch study shows that

the society shares the opinion that somebody should be responsible for one's own health care needs. The individual expects something in return for his or her investment, but this return is lacking. This causes that the unlimited solidarity towards irresponsible health behaviour is decreasing. The shift from collective responsibility towards individual responsibility is a result of the increasing premium. The society is "done" paying for the unhealthy, irresponsible behaviour of others. The increasing premiums cause discontent and have a negative effect on the trust of the public in the healthcare system (Meulen, & Maarse, 2008). By this system, people are facing a social dilemma: they have to choose between what is good for themselves, versus what is good for the society. If everybody would limit the use of shared goods, everybody is better of (Valentinov, & Chatalova, 2016).

That people should be responsible for one's own health is not only a view that is shared in the Netherlands, but seems to be shared in Europe. This means that priority setting is permitted to depend on a number of personal characteristics. This is contradictory to the previous statement that all people should be treated equal. An explanation for this contradiction can be that there is a fundamental belief that life is intrinsically valuable, and everybody is personally responsible for it (Exel et al., 2015).

3. Influencing the decision making process

When people are using fewer medicines and are demanding cheaper medicines, this might lower the prices of the now expensive brand-named medicines. Several methods can be used to nudge people towards better behaviour.

As stated previously, the patient-centred approach has been researched a lot, but has not been applied in reality often. It can however be a valuable tool to let individuals make rational choices and to make them choose for cheaper alternatives. The benefit of patient-centeredness is that the type of medicine fits the individual, and a trial-and-error method will be less necessary (Noerreslet et al., 2009). Also the doctor can convince a patient to use a generic or another cheaper alternative. Especially uncertain patient are more willing to listen to the advice of the specialist. Another benefit is that in some cases medicines are not necessary; some physical diseases are caused by psychological problems. For instance, depressed and socially isolated individuals seek help in medicines. When the doctor is focused on an individual and listen to his or her narrative, he is able to recognize these psychological problems. The doctor is than better capable to discuss the fundamental problem of the patient's problem, which might be a very sensitive topic for the patient (Árnason, & Hjörleifsson, 2016). Culture can also influence how medicines are reviewed. When the values of a patient is central, the doctor can respect and understand the cultural background of the patient (Horne et al., 2004).

Because individuals are insured for health care, they do not always feel that they should choose the cheapest alternative. A possible solution for this is that patients share the costs of health care: by co-payments, coinsurance, deductibles, and other types of private payments. This will make patients become more responsible consumers, due to a higher awareness of the costs (Meulen, & Maarse, 2008). The same results will happen if patients have to pay first, and receive the investment back. Another instrument is to restore the collective responsibility, which will cause them to become more aware of the shared costs.

It should be noted that these methods are only effective when they go hand-in-hand with patient-centeredness. The insights in costs can make patients prefer to choose for a more expensive medicine, but with the advice of the doctor, he can been convinced to choose the equally effective generic. As stated previously, the patient is only willing to substitute the patented medicine with a generic when this is advised by is doctor (Skaltas, & Vasileiou, 2015). The method of letting individuals pay for healthcare has the problem that it is possible that not

everybody can afford it. This might be solved by making special arrangements for people with a lower income.

Prevention is the best medicine. When individuals will never become patients, they will also not need medicines. A tool that is used to prevent sickness is social marketing. Social marketing uses marketing principles to nudge a society towards more favourable behaviour. First, the population is segmented into groups that share needs, wants, lifestyle, behaviour, and values. These groups are likely to respond similar to health interventions. After segmentation, the marketing mix –also known as the four P's- is applied. The product is the set of benefits associated with the desired behaviour; the price are the cost or sacrifice exchanged for the promised benefits; the place is the distribution of goods and the location of sales and service encounters; promotion is the persuasive communication to express product benefits. It should be noted that when health care services or products are too cheap, it could cause distrust in the effectiveness (Grier, & Bryant, 2005). According to Chriss (2015), is should not be forgotten that, when social marketing is applied, that the conditions of a society – culture, economic structure, political and ideological infrastructure- shape an individual, and therefore also the cost-benefit calculations.

4. Conclusion

To conclude, the prices of medication can partly be lowered by influencing the decision making process of patients. When patients choose cheaper alternatives, the expensive alternatives will compete with the alternatives, and this can lower the prices. The decision is mostly dependent on the advice of the doctor. When the doctor applies a more patient-centred approach, the patient will feel more comfortable with the medicine that the doctor advises. If the patient provides the correct amount of information to the doctor, the doctor can advise the patient to choose a cheaper alternative.

This decision can be enhanced when the patient is being confronted with the price. When individuals have to pay for their medicines, they will be more likely to choose a cheaper alternative. It is difficult to predict how much the decision making of patients will lower the price of patented drugs, this is dependent on several other factors. It can at least put less pressure on the healthcare system when people choose cheaper alternatives.

However, there are some limitations to the results of this research. The findings from the literature review cannot always be generalized to all countries in Europe. This generalization cannot be done due to cultural differences between European countries. As seen in the study of Horne et al. (2004), these cultural differences influence the values a society holds against medicines. The study of Exel et al. (2015) shows that there are indeed shared views within Europe about medicines and healthcare. This means that European guidelines can be a tool to lower the prices of medicines, but each country should implement these guidelines in a way that fits the cultural norms in that specific country.

Also the results from surveys and interviews that are used in the literature can hold socially desirable answers. This is always a problem within social sciences and can be limited when conducting an experiment. Also, the research groups in some of the literature were middle aged and highly educated (figueiras et al., 2009; Skaltas et al., 2015; Exel et al., 2015). This means that the elderly group, which are most of the consumers of medicines, are not included in the results; the results are therefore biased.

This research however shows that individuals and society can be influenced to choose a more desirable product. Further research should be done to find how each European country could be best influenced to lower medicine prices.

Integration

1. Introduction

Now that the disciplines economics and social sciences have contributed insights to the main question, this section of the paper integrates these insights.

First, the conflicts between the disciplines and the solutions for these conflicts are introduced. Second, a common ground (Repko, 2004) is created to help answer the main question. After this the main question is answered using the common-ground. Third, the insights of the interdisciplinary part are applied to analyse a case. Fourth a summary is given in the conclusion. At last a critical analysis is provided in the discussion, along with recommendations for future research and policy recommendations.

2. Conflicts

Conflicts between the disciplines can arise within insights, theories, assumptions and concepts. When a conflict occurs, several techniques can be applied in order to create a common ground. For example a conflict arises when one concept explains different phenomena, or different concepts are being used to subscribe one phenomenon (Repko, 2004). The conflicts that occur between economics and social sciences will be discussed further in this section. Also, different techniques are applied to create a common ground

When the information and insights of both disciplines are put together, no major conflicts arise. For instance, both disciplines recognize that price is unknown to both doctor and patient. According to Repko (2004), there is no need to a create common ground. Furthermore, the willingness-to-pay is higher for medication compared to other goods. A reason for this may be that the medication is not paid directly by the patient itself, but it is covered by the health insurance. No technique is needed to create common ground in insights (Repko, 2004).

One conflict in theories arises between the disciplines. In economics, the principle-agent theory explains the relationship between doctor and patient. In sociology, this theory is not used in this research. However, another theory used by sociology has approximately the same meaning: information control. The doctor -the agent- has more information compared to the patient - the principle. The patient however depends on doctor's advice, but at the same time the doctor can decide to provide the information or not and act on this own interest (i.e. has information control). The technique of redefinition is used to resolve the conflict in theories (Repko, 2004). The concept of information control will be redefined as principle-agent theory. As the principle-agent theory can explain both phenomena - the concept of information control and principle-agent theory - , the latter term is used throughout this paper.

A major conflict between the assumptions of economics and social science is that the insights from economics presented in this paper assume that people are rational. Sociology and psychology, however, assume that people do not always act rationally, as they are emotional beings who are insecure and might be influenced by other people.

Although rationality is not mentioned explicitly, it is a widely known assumption. One could argue that moral hazard is irrational behaviour because people prefer the most expensive medication while at the same time cheaper alternatives are sold. This however is not irrational behaviour according to economics. The patient just wants to retrieve as much as he can for the money the paid to the health insurance.

If assumptions cannot be reunited since they are opposites, the technique of organization should be used (Repko, 2004). This means that rationality and irrationality are placed as two extremes on the same continuum.

Figure 5 Continuum of rationality

As can be seen in figure 5 one factor influencing the level of rationality is the severity of the illness. A person with a severe illness is likely to more irrational compared to a health person because he is driven by emotions such as fear and anger (Árnason, & Hjörleifsson, 2016). Naturally, personality traits, such as cultural background, highly influence a person's level of rationality as well (Horne et al., 2004).

Another conflict within assumptions arises that patented medicines will be more expensive compared to generics - non-branded medication. Both disciplines use this assumptions, but also economics recognizes that the price of new patented medicines will be lower compared to its alternatives. In the long-run however, the price will be higher. Because the paper is mainly focused the price of patented medicine on the long run, the assumption will be that patented medicines will be more expensive compared to generics.

A conflict in concepts arises with the economic term "willingness-to-pay", which concerns the maximum price a consumer wants to pay for a product. Social sciences uses the concept of "willingness to replace" which reviews the willingness of a consumer to replace a product of equal quality, for a cheaper alternative. This means that consumers are not willing to buy products that are "too" cheap. The patient doesn't trust generics under a certain price. If this price has been reached the patient will prefer the patented medication, unless he is convinced otherwise by the doctor. We use the technique of extension (Repko, 2004), in which the "willingness-to-pay" contains both perspectives. Willingness-to-pay will now mean "the (minimum and maximum) price a consumers is willing to pay for a certain product without the intention of choosing an alternative."

3. Comprehensive understanding

To reach a more comprehensive solution, the insights of the two disciplines are integrated by using the common ground created in the previous parts. The insights from economics and social sciences are complementary. A new model (see figure 6) is created to show the present interaction (orange and red boxes) between the actors involved

actors. Also, recommendations are given (green boxes) which may lead to lower prices of patented medication.

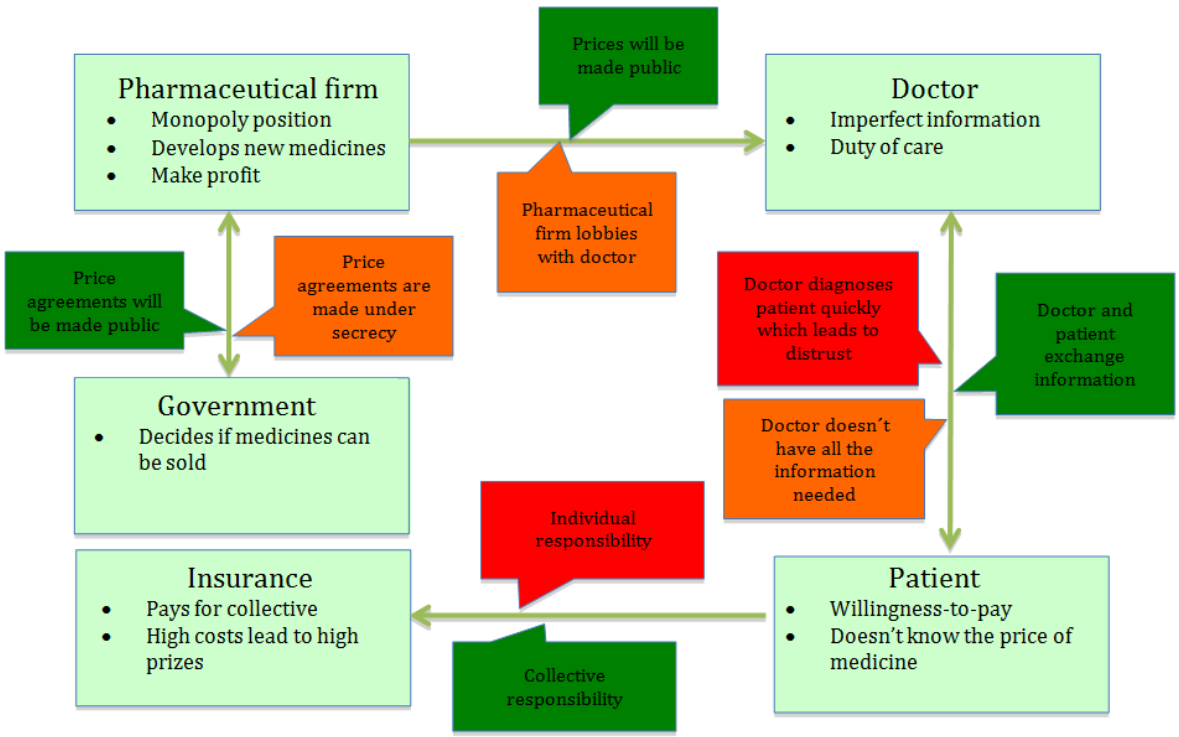


Figure 6 model that explains the current and improved interaction between the different actors. Orange= economical insights, red = social sciences insights, green = recommendation

3.1. Current situation

In the current situation, the pharmaceutical company and a country agree on the (wholesale) price of a new medicine. The bargaining power of the buying party is in this case limited. The pharmaceutical firm has a monopoly position in which it is the only one producing and selling the medicine. Next to this the buyers – or the negotiating governments - are forced to keep the price confidential. This makes it impossible to compare prices and establish a more favourable information position as a buying party.

Decisions made by the doctor to subscribe a certain medicine are based on the symptoms of the patient. If possible, the doctor provides several alternatives for the patient to choose from. Although he listens to the patient, he is also susceptible to lobby attempts by the pharmaceutical industry. If two or more medicines are alike, a principal-agent relation might arise in which the doctor might have other interests than the patient. The doctor might suggest a medicine for which has been lobbied (giving him or her certain advantages) although it might not be in the best interest of the patient. However, in the end, the patient decides which medication he or she prefers.

Important to repeat is that the decision that patients make is not based on costs of the medicines (alone) due to the moral hazard, as presented in the economics section.

In the current situation the patients prefer the most expensive (i.e. branded) medication. Also, people value individual responsibility in which everyone is responsible for their own health. They deem the society is not responsible to pay for the

unhealthy lifestyles of others. The result is that patients prefer what is best for themselves, and not for the collective (Meulen, & Maarse, 2008).

3.2. Suggestions

In order to lower the price of the patented medicines, a few changes have to be incorporated. These changes – which can also be viewed in the green boxes in figure 6 - are: price transparency, collective responsibility and enhancing the trust of the patients. Each of these suggestions will be discussed further in depth.

However, the effectiveness of these changes will depend on the innovativeness of the drugs and if a close substitute is available.

3.2.1 Price transparency

First of all, price transparency can lead to a change in price of patented medication, since up to 50% can be cut off the price during secret price negotiations. When prices are hidden, the buyer will not know what other parties are paying exactly. If however price transparency is forced, countries will be able to compare their prices with other countries with similar welfare.

Although third-degree price discrimination - different groups pay different prices – will still exist, prices will change and might be more related towards the welfare of the country. Price transparency can be achieved through regulation of the EU, although economics cannot give an answer whether this regulation is possible in reality.

This suggestion is not affected by the innovativeness of the medication.

3.2.2. Collective responsibility

Because the patient can choose its own medicine but does not pay for it directly, he needs to be educated about the effectiveness of the medication and its cost. If he has knowledge – result and price - of closely related medicines, he can make a rational choice rather than choosing a patented medicine directly. The patient would choose the cheapest medication if every alternative would have approximately the same effect.

If the patient is made aware of the price and the effect his decision will have for the collective, he will make a decision that is preferable for the collective. This means that rationality would lead to a more collective responsibility instead of a individual responsibility

If the patient could be steered towards a cheaper alternative, sales of more expensive patented medication will drop. In order for the pharmaceutical industry producing patented medication to prevent this drop in sales, it needs to adjust its prices. His suggestion is only possible if there is a comparable alternative available.

3.2.3. Trust of patient

Although a patient can make a deliberate choice, he might still choose a patented medicine over a cheaper alternative. The patient's choice highly depends on the relationship between the doctor and the patient. If the patient distrusts the doctor – f.e. if he does not feel taken seriously - he will be more willing to choose the expensive patented medicine. In order to prevent this, the doctor needs to comfort, inform - in such a way that the patient understands- and involve the patient during the whole process. If these conditions are met, he will be more willing to choose the cheaper alternative.

Due to the choice which has to made between two or more close substitutes, this suggestion will have no effect on the price of an innovative medicine

3.3 Important factor: innovativeness of the drugs

In order to be able to change the price of patented medication some suggestions highly depend on the fact whether the medication is innovative.

If the medication is innovative without close substitutes, only transparency of prices may have an effect on the price of the medication. Because the lack of an alternative, the preferences of the patient will not be relevant. Further explanation will be given in the case study, serving as an example.

However, if alternative medicines are available, not only price transparency will affect the prices of patented medication, but also the consumer - patient- may affect the price. If patients, properly advised by their doctors, choose the best medicine - which will be the cheapest if the medicines have the same effect - generics might be chosen.

3.4 The case

Hepatitis C is a disease which has great effects on someone's personal health on the long run. A new drug, Sovoldi, has been invented which has the potential to cure people who suffer from this disease (Craxi et al., 2016). This cure for hepatitis C, which has an effectiveness of over 90% and more (Adinolfi, & Guerrera, 2015), is now only available for patients in the most progressed stage of this liver disease.

However, since these drugs just have been developed and since this is the only cure at the moment, the prices are very high. According to the last year's study (Iyengar, 2015) in which 30 different countries were compared, they found that the prices of hepatitis C medication varied significantly. Although they cannot be certain about the actual prices since these are deliberately kept secret, a reliable estimation can be made. Even when these prices are adjusted for national wealth, they noticed poorer countries paid more relative to their average annual wages. This study shows that the people in Egypt have to work the shortest amount of time to pay for the treatment: they can buy the drugs if they work 0.21 years. The Polish people have to work the longest for their treatment: 5.02 years. If people in the Netherlands want to buy the drugs, they need to work 0.94 years.

One of the reasons why this medicine is so expensive is due to its innovativeness. In general, if a medicine is developed which has unique abilities, pharmaceutical companies can set a high initial price. Since patients need the medicine and because this will be the only cure, they will be able to sell the drugs at a high price.

As shown in this research paper, the level of sickness has a positive relation with the willingness-to-pay more for the patented medicine. Because the patients within a less progressed stage of illness do not have any access to the new cure, only the patients that are willing to pay too much are potential buyers. It should be noted that this medicine is the only and last chance to save the lives of these patients. Even if a medicine is placed on the market that is as effective as the current medicine, these patients will still prefer the patented drug (Figueiras et al., 2009). This will keep the prices of the medicine at a high level.

If all patients with hepatitis C are able to get access to the new drug, they will be less willing to pay such a high price. The new cure is in that case a higher concurrent with other treatments, which should lower the price of the medicine. When the patients

have to pay a part of the costs, or if they have to pay beforehand, this competition will be even bigger. Because patients are less willing to replace the patented medicine with an alternative (such as a generic), the doctor should advise the patients to replace their expensive medicine with a more cost-effective medicine (Skaltas, & Vasileiou, 2015).

Another technique which can be used is social marketing which is used to prevent behaviour that negatively influences health, such as smoking, unsafe sex and unhealthy food. Because hepatitis C is not always a result of risky behaviour, it is difficult to apply social marketing to prevent the disease (Grier, & Bryant, 2005). This is therefore not a valuable tool to lower the prices of the hepatitis C medicine.

This case shows that the high prices of the hepatitis C cure are not only as a result of the price-negotiations, in which the prices are confidential, but also because the patients are willing to pay a high price. Even if prices are no longer confidential and if a comparable alternative is placed on the market, this will not automatically mean that patients will choose a cheaper alternative. Patients should be convinced by their doctor to choose the cheaper alternative. If this does not happen, it will limit the decreasing prices. A change is necessary done by the different actors - pharmaceuticals, insurance, doctor, and patient - to reach a lower price.

Another option of lowering the prices is to make the price known for all involved parties. Price negotiations are mainly done under secrecy. Countries have the availability to lower prices up to 50% during price negotiations (Vogler, Zimmermann, Piesnegger, & Bucsics, 2012). If countries would know what other countries are paying, they would be able to compare themselves with another country with similar welfare.

Even a better option might be to negotiate the price as a whole continent. If a model was made, measuring different factors (f.e. welfare of a country), different prices can be set in each country. Prices would probably turn out to be lower for most countries since their bargaining power grow immensely. Different prices are still needed in every, since citizens (or health insurance) in every country have a different ability to pay for it.

4. Conclusion

Although prices of medicines are currently high in Europe, there are several options to lower these prices. In order to ensure that patients and doctors can make a decision in which they have all the information they need, more transparency is required; price transparency can lead to a stronger price negotiation between the sellers and buyers of the drugs. Price transparency also gives the doctor better insight on how much each treatment may cost. Next to this, information transparency between the doctor and the patient can increase a patient's trust in the doctor and in the medicine. This increase in trust can be enhanced by involving the patient in the decision making process by using a patient-centred approach. An additional advantage is that patient-centeredness can lead to a more accurate diagnoses.

Furthermore, price transparency enables patients to make an informed decision. If the doctor informs the patient about the costs of the treatment he will better comprehend the value of the medicines. Another way to increase price awareness among patients is to force patients to pay a certain percentage or a fixed amount as a

temporary deposit, so that the patient makes a more considered decision about his medicines.

5. Discussion

This paper has embarked upon a complex issue which is yet to be resolved. As long as the pharmaceutical companies are free to set their own prices and are not controlled by any other organ, chances will be small that they will change the way of setting their prices. Healthcare is a unique industry in which the need for effective goods are high, and it is a market in which the supplier has an enormous amount of power. People want to get better at any costs, and if they are gravely ill they are willing to pay more.
The interdisciplinary approach showed that indeed the high prices cannot only be explained by using economics, as stated in the introduction. When solving this problem (e.g. when the prices should be lowered) it is highly recommended, to also look at how the buyer, the patient, makes a decision. Patients cannot be considered as rational consumers, and therefore are the social sciences integrated in this research.

This research also has its limitations. One of these limitations is that R&D is not included intensely enough. It might be possible that a lot of cost savings can be achieved here. We excluded R&D because it was suggested that R&D did not contribute a lot to the costs of drugs. It is however possible that savings can be achieved when looking at the bigger picture. Also, philosophy is not included but could give an interesting angle of how the prices should be set, from the perspective of how much a treatment is worth.

Another limitation is that the suggestions that are given, might be hard to implement in real life. Pharmaceutical industries do not benefit at all from transparent prices. At this moment they have a 'take it or leave it' policy in which they set a certain price but they allow secret negations to lower the price. A continental negotiation might not be possible to the EU legislation, but this is not something either of both disciplines cover. Furthermore, it might not be possible to force patients to pay a certain price up front, or they might not even be able to do this due to their financial state. And apart from this, doctors already try to put as much effort they can in their patient to inform the patient as good as possible. However, it does open the debate on how these prices are so high, and why the pharmaceutical industry is so powerful.

Further research is necessary in which R&D is included, together with the disciplines used in this paper. Research should also show if it is possible to apply the suggestions that are given in reality, and if this will indeed lower the prices as expected. Until that time, there is not a lot we can do against the power of the pharmaceutical industries.

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