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A Comparative Analysis of the Price of Insulin in Canada and the United States

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A COMPARATIVE ANALYSIS OF THE PRICE OF INSULIN IN CANADA AND THE UNITED STATES

by

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ABSTRACT

There's frequent discourse regarding the rising cost of insulin in the US. Insulin is a drug that over 7 million people rely on for survival, and it has tripled in cost over the last decade. The pricing regulation of the drug is dependent on multiple stakeholders, including wholesalers, pharmacy benefit managers, and manufacturing companies. Due to the lack of governmental intervention in the process of pharmaceutical cost regulation in the US, data on the price negotiations and the rebate system between these entities is unavailable in public records, making it difficult to determine a primary cause as the root of the issue of insulin costs. This paper attempts to understand the policies in place that impact the nature of insulin affordability and assesses the Canadian regulation of the cost of insulin to understand the discrepancy between the affordability in Canada in comparison to the affordability of insulin in US. A literature review was conducted to examine the policies and congressional discourse in order to analyze the current insulin market and the policies currently in discussion. Ultimately the discrepancy between the nature of health care in Canada and in the US is characterized by the underlying social principles that govern each country in terms of health policy. The Canadian health care system is built on the foundation that health care is a human right, whereas in the United States, health care is a commodity. The effect of this ideology is observed in the costs and regulation of pharmaceutical insulin.

DEDICATIONS

For my brother, who constantly inspires me to work harder. Thank you for your guidance.

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INTRODUCTION

Health care is a critical aspect of governmental and economic concern. Every country has developed a different method of providing health care, characterized by each nation's distinct political ideology. Within the United States, the fragmented systems of both private and public health insurance reflect clashing ideologies in health care as a privilege versus human right. The policies of health care in the United States have been largely influenced by major health institutions, creating a model for maximizing profit and business. This has created a system in which financial coverage is necessary in receiving accessible health care. On the contrary, Canadian health care is characterized by the principle that it is a basic human right and should be equally accessible to everyone (Barr, 2011). In Canada, different federal and provincial policies are in place that grant universal accessibility for health coverage. In line with this ideology, there is greater governmental regulation in health policies in Canada to ensure a fair distribution of health care coverage. In the US, governmental regulation remains minimal in the case of health coverage, and there is a high degree of inequity in the distribution and quality of health care received by the population. The differences in health care ideology can be seen in the pharmaceutical regulation and cost of insulin in both countries. The costs of insulin in the US is a critical topic of concern. The different ideologies in health care in Canada and the US reflect the way in which the cost of insulin is regulated and distributed to consumers.

Diabetes Mellitus and Pharmaceutical Insulin

Before discussing the cost of insulin, a general overview of diabetes and insulin reliance will be discussed. Diabetes mellitus is a disease characterized by the dysfunction of the body's ability to monitor blood glucose levels. Under normal physiologic conditions high blood sugar levels trigger the beta islet cells of the pancreas to release a polypeptide known as insulin. Insulin then signals other cells to uptake sugar and lower the blood sugar levels. When blood sugar levels are too low, alpha cells of the pancreas release glucagon which acts on the liver to breakdown glycogen stores, releasing more glucose in the blood. This feedback mechanism works to regulate blood sugar levels within the normal range of 99 to 140 mg/dL (CDC 2019). According to The World Health Organization, diabetes is "identified by the presence of hyperglycemia" and includes "defects in insulin secretion, insulin action, or both, and disturbances in carbohydrate, fat, and protein metabolism" (WHO, 1999). Patients with diabetes often require synthetic insulin to manually regulate their blood sugar levels. About "8.3 million US citizens" rely on insulin to manage their blood glucose levels and it is estimated that "worldwide insulin use will climb 20% by the year 2030" (Jerimias, 2020).

The three most common types of diabetes include type 1, type 2, and gestational diabetes, identified by the different conditions of pathophysiology. Type 1 diabetes is predominantly developed in childhood and adolescence as an autoimmune disease in which immune cells respond to and breakdown beta islet cells of the pancreas, inhibiting the ability to produce insulin. Type 2 diabetes is more likely to develop in adulthood and causes include a combination of genetic and lifestyle factors. The incidence rate of a younger population developing type two diabetes is increasing with the rise of obesity, especially in urbanized areas (Ahmad, 2013). The

form of hyperglycemia in type 2 diabetics is due to a “combination of deficiency in insulin secretion and action” (Ahmad 2013). Gestational diabetes occurs during deficient insulin secretion during pregnancy and affects 2-10% of pregnancies annually (CDC, 2019). Everyone with type 1 diabetes and many people with gestational and type 2 diabetes require administration of synthetic insulin multiple times a day to maintain healthy blood glucose levels.

According to the CDC, diabetes is the seventh leading cause of death in the US. Long term complications that arise due to the blood sugar fluctuations of diabetes include kidney failure, lower-limb amputations, blindness, heart disease, and neuropathy (CDC, 2019). The National Statistics Report of the CDC notes that a population of over 122 million Americans have diabetes (CDC, 2020). Cases of diabetes are increasing over time due to the increase in average life expectancy and the rise in obesity (Ahmad, 2013). The increasing worldwide levels of obesity greatly contribute to higher rates of type II diabetes and a lower age of development of type 2 diabetes is witnessed.

With these upward trends of diabetes, there is a growing number of individuals who rely on pharmaceutical insulin to regulate their blood sugar. Regulation of diabetes includes monitoring blood glucose levels, administering insulin after a meal, and ensuring blood levels do not stoop too low. People use two options in order to check blood glucose levels: Dexcom Continuous Glucose Monitors (CGMs) and blood glucose meters. Blood glucose meters check blood glucose levels at the time the reading is taken whereas CGMs continue to take blood sugar readings throughout the day.

There are five types of insulin that are offered. However, the choice of treatment plan for those who require insulin to manually regulate blood sugar levels is normally made by the physician or medical provider after an assessment of the patient’s lifestyle and metabolic

activity. There are rapid and short acting insulins normally taken right before meals and there are long and ultralong acting insulins that leave effects between 24-42 hours after injection. Long acting insulins are normally injected once or twice per day, whereas the short acting insulins can be injected anywhere around five times daily (ADA). There are also intermediate acting insulins and mixtures of the other variations. Based on lifestyle and metabolism, a physician will recommend a treatment plan that will best serve the individual. The treatment regimen is highly individualized, varying greatly based on the individual's case.

While insulin is vital for survival for many individuals, the cost of insulin in the US has risen alarmingly, adding pressure to those who struggle to afford the drug. For example, an analysis by the Center for Medicare & Medicaid Services' National Average Drug Acquisition Cost Data reported a 15-17% increase in insulin per year from 2012 – 2016, represented in Figure 1 (Cefalu et al., 2018). There has also been a 10% increase of cost per year for those under coverage by Medicare Part D (Cefalu et al., 2018). The excessive costs are especially notable when comparing the list prices of insulin in the US to list prices of insulin in other countries. A price index analysis recorded manufacturing prices of insulin in the US are often five to ten times those in other countries (Mulcahy et al., 2020). Figure 2 illustrates the discrepancy between the average price per standard unit of insulin of human and analog insulins in the US versus other countries, including the 19 countries who are part of The Organization for Economic Co-operation and Development (OECD), an intergovernmental economic organization.

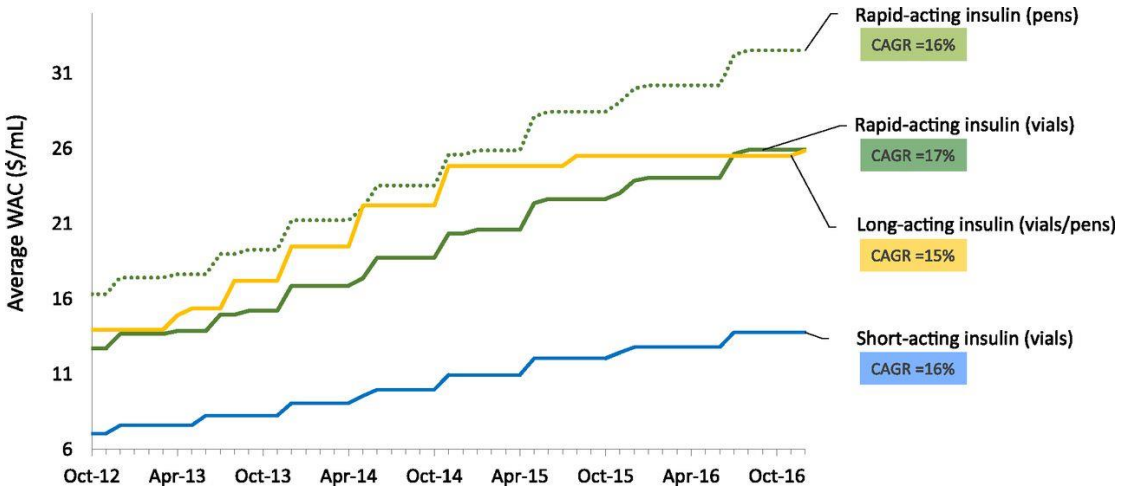

Figure 1: Rising Cost of Insulin in the US

Source: USC Schaeffer Center analysis of First Databank data from the American Diabetes Association.

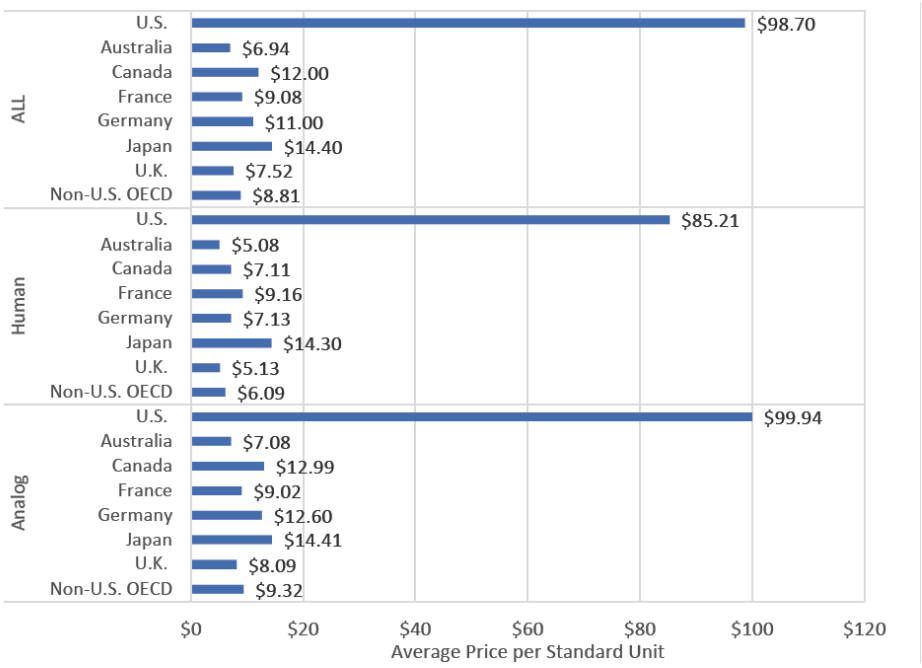

Figure 2: Average Price per Standard Unit of Analog and Human Insulin in Different Countries

Source: Rand Corporation

The excessive cost of this drug is a pressing concern for those who rely on insulin to regulate their blood sugar levels. This includes all those with type 1 and some individuals with

type 2 and gestational diabetes. As the out of pocket expenditure of insulin rises and people struggle to afford a necessity, cases rise of people torn to rationing their insulin. In rationing their insulin, individuals will inject less doses than advised in order to make their supplies of insulin last a longer period of time. In the case that individuals do not notice the short-term complications of this, they are at risk of the complications that can arise in the long-term by deviating from their treatment plan. This is a dangerous game leaving people at risk for diabetic ketoacidosis and long-term complications from fluctuations in blood sugar levels such as neuropathy, cardiovascular disease, kidney damage, and eye damage.

There are many cases of people in need of insulin travelling beyond borders in hopes of acquiring insulin from Canada at a lower cost. Those who do not have the opportunity of travelling across borders and cannot afford insulin in the US are at risk of the dire health consequences of erratic blood sugar spikes that can ultimately lead to death. Approximately one in four people with diabetes report underuse of insulin due to cost-related concerns (Herkert et al., 2019). This is a matter of urgent concern for the population of people who cannot afford insulin. While the pricing regulation of insulin in Canada may not be perfect, this alone is reason to observe the discrepancy that exists between the two countries in health care policy. The aim of this thesis is to explore implications and regulations of the cost of insulin in the US. The regulations that monitor the cost of pharmaceutical drugs in Canada will also be assessed to determine the differences in price and accessibility of insulin. Factors in price regulation of insulin in the US to be assessed include provisions of intellectual property, the manufacturing companies set prices, the lack of transparency in pricing regulation, and the tangled supply system.

INTELLECTUAL PROPERTY

In this section the manipulation of patent laws is assessed to determine the way in which it influences the costs of insulin, why more affordable products aren't available, and the way in which the Biosimilars Price Competition Innovation Act might affect the insulin market in upcoming years.

One of the ways that major drug manufacturing companies keep their profits high is by manipulating the patents for their drugs. Intellectual patent laws allow a brief period of monopolization of a drug. Patents are granted by the US Patent and Trademark Office, allowing a period of 20 years of ownership to a manufacturing company while The Food and Drug Administration (FDA) grants exclusivities in varying time lengths (Hicky et al., 2019). These programs are in place in order to incentivize competition for scientific discoveries and ensure the safety of the products that are in the market. These exclusivities can be granted either for new innovations in the process of creating the drug, an active ingredient, or delivery of the drug. After an applicant is granted a patent or exclusivity in the market, a third party cannot enter the market to provide a generic or biosimilar product to offer a cheaper alternative. Strong patent laws have kept the US globally competitive in innovation and benefit the health field in medical advancements. This indicates that the patent laws allow incentive and profit to fund research and development in the intent of discovering new pharmaceutical drugs and other innovations in the field of health.

In theory, once the patent period ends, other options should surface in the market to allow greater accessibility and affordability of the patented products. As the research supporting the safety of the product has already been conducted and approved, emerging generic products

market at a lower cost. This free market environment then drives competition to lower costs of the drug and increase accessibility of the product. However, companies have been observed to continue extending the length of their patent based on innovations in delivery system, maintenance, and other "peripheral aspects of the product," to maintain their dominance of the market (Juo and Kesselheim, 2015). This process of extending the lifetime of patent period is known as evergreening. In patent evergreening, a drug manufacturing company can extend patent rights on a drug for a prolonged period of time, limiting the potential for a generic drug in the same therapeutic class to enter the market. The drug manufacturing company retains the market exclusivity for as long as the patent period is extended by finding new aspects of the drug making process to patent.

There are currently over 100 patents on insulin products (Jerimias, 2020). These patents allow Eli Lilly, Sanofi Aventis, and Novo Nordisk to "account for more than 90% of the global insulin market" (Luo et al, 2015). Patents and exclusivity are given to minimal improvements or alterations in insulin production processes, constantly providing newer forms of insulin that are minimally different from older variations from the same manufacturing companies. This process of patent evergreening prevents the opportunity for an affordable option to enter the market to drive competition in reducing costs of insulin. Data suggests that "when one insulin manufacturer increases the price for a given insulin formulation, the other insulin manufacturers often increase their prices by a similar amount shortly thereafter" (Cefalu et al., 2018). This represents a failure of the free market economy in the pharmaceutical industry as it applies to insulin products.

The way in which the three manufacturing companies have maintained dominance of the insulin market through patent evergreening indicates the gaps in the intellectual patent laws that

contribute to the issue of insulin affordability. The time frame of market exclusivity incentivizes innovative advancements under the notion that after the period of exclusivity expires, a free market would drive competition and increase affordability. However, gaming the system of patent exclusivity as witnessed by the manufacturing companies contributes to a failed free market system at the expense of consumers.

Biologics Price Competition and Innovation Act

The inaccessibility of insulin due to high costs encouraged a review of the process of biosimilars entering the insulin market. As of March 23rd, 2020, the Biologics Price Competition and Innovation Act of 2009 (BPCI Act) modified provisions to include insulin in the allowed follow-on biologic products under The Patient Protection and Affordable Care Act (Endocrine Society). Under the adapted provision of BPCI, "insulins will be regulated as biologics" and "developers will be able to seek licensure for subsequent-entry insulins under the biosimilar pathway" in hopes of allowing patients to have more options for insulin (Center for Biosimilar Staff, 2020). The provisions of modifying this act attempts to encourage further biosimilar products to enter the market to drive competition of insulin products.

This is a step in the right direction as it attempts to solve the issue of insulin inaccessibility by encouraging competition in the free market. However, in the process of making minimal adjustments to current policy, the larger scope of the issue is not being resolved. The flaws in the intellectual property policies that are being adjusted do not rectify the lack of transparency in the supply chain of insulin that allows stakeholders of the market to increase costs without direct regulation. The provisions being adjusted in this act perpetuate the

prioritization of profit and economic benefit in the health policy, further reflecting the US ideology of health care as a business model.

INSULIN DISTRIBUTION AND THE SUPPLY CHAIN

Beyond the patents in place complicating the accessibility of insulin, there is a complex network in place for the distribution of insulin from manufactures to patients in the US. There are multiple bodies involved in the insulin supply chain. This convoluted system instills points of obscurity in the inflated costs of the drug. The parties profiting from the insulin supply chain include the manufacturing companies, wholesalers, pharmacies, pharmaceutical benefit managers (PBMs), and health insurances. In assessing the inaccessibility of insulin, it's important to recognize that each company's best interest is in maximizing profits for their stakeholders.

The drug manufacturing companies are responsible for setting the list price of insulin. They then work with pharmacy benefit managers for their products to be covered in formularies, allowing the product to be disbursed to those with insurance coverage. To ensure these drug products are allowed under insurance formularies, drug companies pay in the form of discounted products, known as rebates, given to PBMs and insurance companies. This means that the drug is sold to the PBMs and insurance companies at a net cost lower than the list price, with the PBMs making profits from the rebate negotiations. Drug companies are then encouraged to increase their list prices to maintain profit for their company shareholders and pay for their research and development processes. Drug manufacturing companies claim that their list pricing is impacted "in order to achieve preferred formulary positioning," indicating that higher rebate costs will allow preferred access to drug formularies (Cefalu et al., 2018). Records of drug prices also indicate that there is a widening gap between net and list prices of insulin, illustrating that the net price of insulin is increasing at a higher rate than the increase of list prices (Cefalu et al., 2018).

While the negotiations between PBMs and drug companies are private records, the widening gap implies that the PBMs and insurance companies are financially benefitting from this system.

The private negotiations between PBMs and drug companies make it difficult to assess the exact influence of PBMs on the rising cost of insulin. There is a fundamental lack of transparency in their efforts and speculation with whether or not the negotiations are in benefit of the consumer. As PBM's records are not public information, there is no way of knowing what changes their efforts are making, and no way of proving that it is in the benefit of the consumer. Under the current system, a PBM could choose a higher priced drug product that would reward them a higher rebate to place on an insurance formulary, instead of a lower cost drug product that would offer their company less profit.

In a hearing conducted on April 10th, 2019, the executive vice president of external affairs at Sanofi, along with the senior vice president of Eli Lilly and president of Novo Nordisk all claimed that the high rebates set in place by the PBM's are the reason for the influx in list price of insulin. They argue that the rebate system is not distinctly benefiting the consumers and that their company's net manufacturing profit of insulin has steadily decreased in recent years. Within the supply chain system, some of the leading PBM companies are also in direct ownership of insurance companies that are benefiting from the rebates of insulin. This means that the insurance companies that are being paid rebates are also under ownership of the pharmacy benefit managers who are in charge of the rebate negotiations. When the pharmacy benefit manager and insurance company is under the same ownership, they reap their own benefits, without having to disclose their negotiations to the public. This integrated network allows for price influx in each step of the process that all contribute to the issue of insulin inaccessibility. This opaque network of supply chain in insulin distribution sets up a list of

stakeholders and a failure of free market contributing to the struggle people face in paying for a drug that is vital for their survival. Figure 3 illustrates the complex system of the insulin supply chain in the US. The complex and intertwined network of pharmacy managers, drug companies, insurance companies, and wholesalers makes it infeasible to identify a source of the high cost of insulin. The undisclosed records of these obscure members of the supply chain and the lack of federal regulation in the system adds to the difficulty in potential progression from the current framework to one in which insulin is more accessible to consumers.

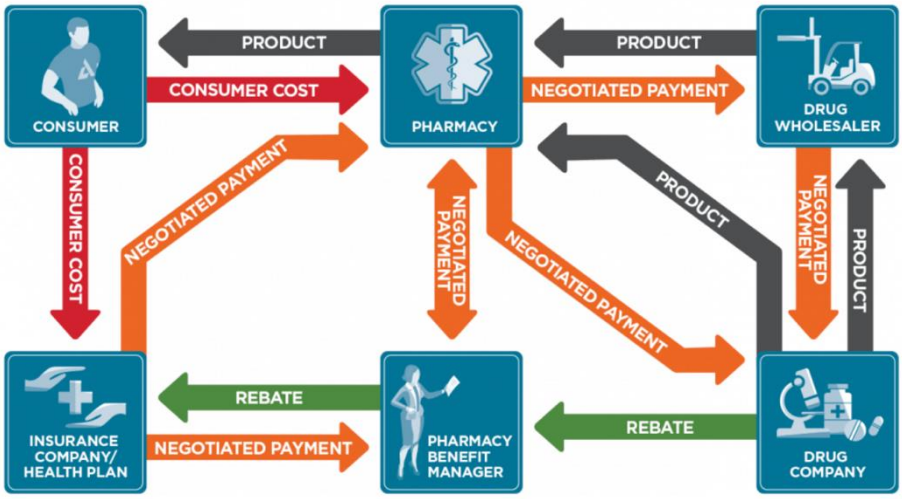

Figure 3 Map of Insulin Supply Chain

(Source: Insulin Access and Affordability Working Group: Conclusions and Recommendations)

The obscurity in place makes it difficult to determine a sole reason that the cost of insulin has tripled in the last decade (Hua et al, 2016). Many speculate that pharmaceutical companies are making profit from the high list prices, whereas others believe rebates by the PBMs are driving the cost of insulin's list price. This supply chain makes it difficult to establish the driving

force behind the cost increase of insulin in the market and makes it difficult to place blame solely on the shadowing of insulin by the three dominant manufacturing companies.

The supply chain presents another contributing factor in the issue of insulin affordability. It would be naïve to assume the companies involved are designed in the best interest of the consumer. Negotiations and cash flow between the companies in the supply chain should be more available to the public to pinpoint flaws of the system in order to resolve the issue of insulin inaccessibility. There is an urgent need for more regulation in the system to monitor the cost and cost distribution.

CANADIAN REGULATION OF PHARMACEUTICALS

Many people in the United States have turned outside of its border to purchase inexpensive insulin from Canada. Politicians have begun discussions on plans to import drugs from Canada as a solution to the high costs of insulin in the US. This raises a question in the regulatory distinctions between the two nations that cause such a discrepancy in pharmaceutical costs. In this section, the regulations in place will be assessed to determine the discrepancy between the list price of insulin in the US versus Canada.

Canada has a national health care system with universal coverage. Under the principle that health care is a basic right, there are regulations in place in both the federal and provincial levels that provide health coverage for necessary hospital and physician services (Canada's Health Care System, 2019). Prescription coverage, however, is not included in this plan. Similarly to the system in the US, the drug manufacturers in Canada are in charge of setting list prices for their product. While drugs are not covered as part of their universal coverage, Canada has programs in place to monitor their drug costs to maintain accessibility and affordability. It is understood that maximizing company profit and funding for further advancements in medical innovation diverges from best interests of consumer accessibility. To monitor this clash between the drug companies and the community, the Canadian government "has the power to approve drugs, regulates their promotion, monitors their safety, and sets the economic and industrial policies" (Lexchin, 2016).

Patents provide the opportunity to monopolize a drug, providing incentive for medical advancements and innovation. The stronger a country's intellectual property laws, "the longer the companies have a monopoly on their products and the more money they can make from

them" (Lexchin, 2016). Patents are normally granted over a period of twenty years allowing a manufacturing company to have the exclusive right to "make, use, sell, or import the invention in the United States" (Congressional Research Service, 2019). These strong intellectual property laws encourage innovation in the health industry and contribute significantly to the medical advancements. However, as previously discussed, patent evergreening has been witnessed in the US in which drug manufacturing companies manipulate regulations of extending patents to deter competition and extend the duration of their exclusivity period. This contributes to the failure of the free market economy in encouraging competition within the insulin market to reduce costs for a drug that has been available to people for decades.

In comparison, concern about rise in drug costs due to strong patents is combated in Canada by the establishment of the Patented Medicine Prices Review Board (PMPRB) which was established in 1987. The PMPRB serves as a quasi-judicial body in charge of reviewing patented drug products. It was established under the Patent Act in 1987 in Parliament. The PMPRB has regulatory roles to ensure that the "price charged by patentees for patented drugs" is monitored by comparing drug manufacturing set prices with drugs of the same therapeutic class in seven other countries including France, Germany, Italy, Sweden, Switzerland, the United Kingdom, and the United States. Drug manufacturing companies are responsible for and in charge of setting their own list prices but will be called into a public hearing if the list prices are deemed excessive by the standards of the PMPRB. If drug costs are concluded to be excessive in the hearing, any excessive revenue by the drug company will be recovered (Lexchin, 2016). The PMPRB also has roles in reporting annual statistics of "the prices of patented medicines and price trends of all drugs" (Patented Medicine Prices Review Board 2018). Through this governmental regulatory body, manufacturing list prices are governmentally observed to

guarantee that costs are not overly excessive in detriment to the consumers who rely on the drug. The effects of the PMPRB can be reflected in the comparison between prices of insulin products in Canada and the US. Figure 4 illustrates this in the case of glargine, one of the long acting forms of insulin administered to treat hyperglycemia (Beran et al., 2018).

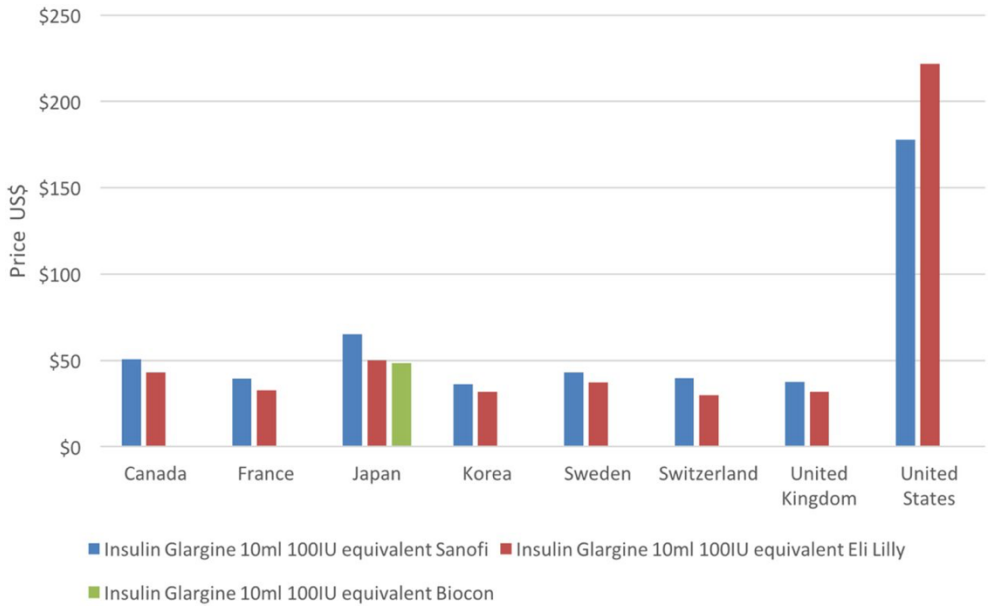

Figure 4. Price of Glargine in the US compared to other Countries

Source: American Diabetes Association

The cost of insulin remains to be a topic of concern in Canada as well, as this system is not a perfect enterprise. While the governmental regulation in Canada is in place to monitor patented pharmaceutical costs, the government also recognizes the reliance of health industry in fueling the economy, and that companies should profit and benefit from their products (Lexchin, 2016). The PMPRB is currently in the process of updating the prescription pricing rules to better accommodate their population. Within the new guidelines of the price review of pharmaceutical drugs, the PMPRB is planning to remove Switzerland and the US from the countries used in

comparison of drug costs to avoid skewing up the cost of drugs. This, along with a number of other provisions are being updated to adhere to the concerns of high drug costs in Canada.

Although neither systems are perfect, allowing government to monitor the insulin distribution evades the issue of obscure negotiations between the supply chain. There is a heightened sense of transparency in the costs of pharmaceuticals in Canada, and in effect, the insulin in Canada is ultimately more affordable compared to the options individuals are provided in the US.

FUNDAMENTAL DISTNICTIONS BETWEEN CANADIAN AND US HEALTH POLICY

There are fundamental cultural differences in place that contribute to the distinction in design of health care between the United States and Canada. The basic principles of social policy in Canada indicate that health care is a basic right of all Canadian citizens, the power of medical profession is limited by social obligation, the government retains power, and there is one standard of health care for all citizens (Barr, 2011). In comparison, the US health care system is based on social policy that indicates it serves as a market commodity to be distributed according to the ability to pay and that power belongs to the organization and is concentrated in the medical profession, while government has a relatively minimal role in guiding the system of health care (Barr, 2011). These deep-rooted cultural sentiments are reflected in policies and policy reform.

Although the industry acknowledges the importance to serve in the best interests of the general population, the way in which the system works has not reflected this sentiment in the US. Discourse regarding the issue of insulin inaccessibility has demonstrated the way in which the United States' model of health care is based on market economy, with the leading shareholders of the insulin market in the position of power. There has been minimal action done to reflect the need for immediate reform. The steps that have been taken have showed limited improvement to the majority of those who need it. Some plans available may only apply to a small population who meet specific guidelines for a limited amount of time, such as in offering a short, one-time supply of insulin at a discounted price from the drug manufacturing company. Other plans that have been introduced may only apply to those who qualify for Medicare and Medicaid, or specific qualifications based on low-income. These temporary solutions do not acknowledge the

flaw in the design of the system as a whole, and do not benefit the majority of people who need access to lower priced insulin. So long as these companies are given the upper hand in the discussions surrounding policy reform, there is minimal hope for adjustment in the design of the system.

H.R.4906 – Insulin Price Reduction Act

In an attempt to fix the root cause of the issue of insulin inaccessibility, The Insulin Price Reduction Act was proposed on October 29th, 2019 by Diana DeGette, co-chair of the Congressional Diabetes Caucus. This legislation encourages manufacturing companies to reduce their list price to the price that it was under in 2006 and prohibits insurers from refusing to cover any insulin product that lowered their list price (H.R.4906, 2019). All Medicare and private insurers would cover insulin with no deductibles. The goal of this act is to undermine the complexity and obscurity of the insulin supply chain. In cutting out third party negotiations and stakeholders and incentivizing the manufacturing companies to reprice their insulin products to the price it was in 2006, the bill aims to reduce costs of insulin by 75%.

This attempt of reform calls for increased regulatory action by the government in the pharmaceutical industry of insulin and demonstrates efforts of increasing transparency to benefit consumers. This has been the only recent proposal intending on undermining the obscurity in place of the insulin supply chain in order to serve the best interests of the general population. This policy is still under a review process by the House and Energy Commerce Subcommittee on Health (H.R.4906, 2019).

CONCLUSION

Acknowledging the different principles of health care between the US and Canada concedes the understanding of the distinguishing factors that ultimately lead to differences in the regulation of insulin costs. The principle differences in political ideology have constructed two very distinct systems of government. The effects of the differing social policies between the two countries have been reflected in the differences of insulin accessibility in the US and Canada. In Canada, where the social principle of equal health care accessibility to all individuals is a deep-rooted sentiment, the government has a stronger role in the regulation of health policy and drug supply systems. In the United States, where the profitability of the health care market is highly prioritized, the prices set by drug manufacturing companies are unregulated. The system in place in the United States has developed into an obscure market. As a growing population of people rely on insulin for survival, the cost of insulin has become disconcertingly high. This contributes to people dangerously rationing their insulin in order to make their insulin supply last, travelling across borders to obtain insulin at a cheaper price, and struggling to manage their hyperglycemia.

After its invention in 1923, insulin was originally sold for one dollar. While insulin has developed greatly since it was first introduced, the cost of insulin no longer reflects its improved value. The gaps in the current framework of distribution include the gaming of intellectual patent laws and the obscurity of the supply chain system. Congressional proposals have been introduced to resolve these issues but have not yet provided reform. The underlying social principles of the US lead to hesitation of stronger governmental regulation within the financial distribution of pharmaceutical profit. While steps have been made in the right direction of trying to improve insulin accessibility, there is still great room for improvement and more work to be done.

This analysis of the high costs of pharmaceutical insulin in the United States is limited due to the lack of availability of negotiation records between drug manufacturing companies, insurance companies, and pharmacy benefit managers. While speculations have been made based on list prices provided by drug manufacturing companies and the net cost of the products on the market, a true understanding of the cause of the cost influx is not readily available. As the negotiations between the companies are private documents, the root cause of the issue cannot be clearly defined. As this topic is also one of current concern, many proposals have not yet been voted on in congress. In time, the new policies may have effects of uncovering the obscurity of the market and may provide newer data of the cost distribution of the insulin supply network.

Future research may be conducted to study the new proposals being discussed in congress that aim to reduce the gaps in the current framework of the insulin cost regulations and their effects. In addition, while Canada provides insulin at a lower cost in comparison to the United States, on a global scale, Canadian insulin products are relatively more expensive than insulin from other developed countries. Further studies may explore the regulatory bodies constituting the cost of insulin in other nations in efforts to further explore the effects of the US social policy of health on the cost of insulin.

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