

Forum: World Health Assembly

Issue: The Question of the Insulin Crisis Globally

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Introduction

The World Health Organization states that diabetes is “chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves.” While there are two common types of diabetes, Type 1 (chronic condition where the pancreas is unable to create insulin) and Type 2 (the body becomes resistant to insulin or doesn’t make enough, and is most common in adults), an injection of insulin can help save the person’s life. There are around 422 million people who suffer from this illness and it is a life-threatening condition, causing 1.2 million deaths per year. (WHO - Since the discovery of chemically-synthesized insulin in 1963 and its production through biotechnology in 1978, insulin has been on WHO’s Essential Medicines List since the first list was published in 1977. However, although it is essential globally, the rise in its cost has caused people to treat it as a luxury, and protests have erupted around the world to fight the battle of making it once again accessible and affordable to all social classes.

Definition of Key Terms

Diabetes

As stated previously, there are two (common) types of diabetes that are found around the world. Firstly, Type 1 Diabetes is considered an autoimmune disease and means that the body is unable to make its own insulin or cannot produce enough, which is caused by the body’s attack on the insulin cells in the pancreas. It is mostly commonly found early on in life, but may also develop in adulthood. Furthermore, Type 2 Diabetes occurs when the body becomes resistant to the effects of insulin. This causes the

overproduction of insulin in the pancreas in the early stages of the disease and eventually leads to the insulin cells burning out.

<https://www.healthline.com/diabetesmine/pharmacy-benefit-managers-and-drug-pricing>

Insulin

Insulin is a type of hormone that is secreted by the pancreas to help regulate blood sugar levels, and allows the body to sufficiently use the glucose in the bloodstream. Although insulin is used to treat both types of diabetes, there are a variety of insulins that have different acting functions. To start off, rapid-acting insulin works extremely quickly as it imitates the pancreas by rapidly dropping blood sugar, and works for a short period of time, plus it can help prevent blood drops during the night if taken directly before a meal. As a rate, it takes around 15 minutes to cause an effect and can last up to three to four hour. Moreover, slow-acting insulin takes effect and wears off more quickly than long-acting insulin, and it is recommended to be taken in the morning and studies show that it has the least potential to cause a severe drop in blood sugar levels. As a rate, it takes around 30 to 60 minutes to work and can last up to five to eight hours. In addition, intermediate-acting insulin finds a middle ground between slow and fast acting, and takes around one to two hours work and can last up to 14 to 16 hours.

Analog Insulin vs. Human Insulin

With that being said, long-acting insulin is a type of insulin that has no peak and can last up to 24 hours. In relation, a different form of human insulin is analogue insulin, which is laboratory grown, however, it can be genetically altered to either create a rapid or intermediate reaction. In most cases, it is chosen over the regular human synthesized insulin due to its rapid rate of reaction and its ability to mimic the pancreas and help blood sugar levels stabilize in a faster manner.

Healthcare: In Relation to Politics and Society

Essential Medicines List is a list of medicines published by the United Nations, is the bare minimum of medicines that are required in every single country, in every single healthcare system. To no surprise, insulin has been on the list since it was first published, in 1971, and continues to be an extremely valuable resource of treatment in every single healthcare system. However, even with the awareness raised on it, the rising price of insulin does not seem to slow down any time soon, meaning that more needs to be done. Moreover, low-income countries are, according to the World Bank, countries that have less than \$1,026 for a gross national income per capita. These countries usually have a lower than average life expectancy, a higher mortality rate, and poor educational outcomes, as well as bad healthcare outcomes. This is not the case in some countries but definitely happens with the majority. In relation, middle-income countries are ones that have a gross national income per capita of \$1,026 to \$4,035, for the lower section of this division, and a gross national income per capita of \$4,038 and \$12,475 for the upper section of this division. In addition, non-communicable diseases, also known as NCDs, are in sum, the cause of over 70% of human deaths worldwide. There are a total of ten non-communicable diseases, however, the majority of the statistics are based solely on 4 diseases. Hence, these four diseases include heart disease (a wide array of different diseases in relation to the cardiovascular system), stroke, cancer, and the topic at hand, diabetes. In regards to the recent data collected, most countries in the world have general availability to blood glucose testing, excluding a few third-world countries, a good sign to raise diabetic awareness in the country. However, although many of these countries provide the testing needed to diagnose diabetes, they are unable to secure sufficient amounts of insulin, and at an affordable price. In regards to this, primary healthcare is technically essential healthcare that is based on scientifically proven and socially acceptable methods of treating patients and diseases. In a way, it is more people-centered than disease-centered. In Canada, and in most places in the world, there are 5 principles and values that primary healthcare is based on. The 5 values are, as stated by the Canadian Nurse Association, “accessibility, public participation, health promotion,

appropriate technology, and intersectoral cooperation.” This does not only include the visit to a primary healthcare physician or provider, but it also includes when the physician provides a diagnosis, a treatment, and a follow-up session. In regards to the insulin crisis, although the physicians do provide a prescription of the insulin doses, some patients, now a majority in the world’s current situation, most patients, especially the ones who don’t have insurance, or whose insurance does not cover their insulin prescription are unable to live up to the primary healthcare standards, due to the rising costs of insulin worldwide.

Continuing, in simple words, research and development is the process of transforming an idea or revelation into a product or service that can be used in the healthcare industry. The end result should include a viable and safe product that is effective and used appropriately, and affordable, as well as accessible to those who require it the most, no matter their social or economic status. In terms of the insulin crisis, research and development were a big part of it. On one hand, they achieved it in an impressive manner on how quickly they were able to advance their research and put out a product on the market and make it available to the public. However, on the other hand, one part that lacked a part of the goal was making it available to the people who need it the most. Although there are many brands and companies that provide countless versions of the product, it is not the most affordable, especially now during the pandemic. The price of insulin has skyrocketed over the past century, (as it was discovered exactly 100 years ago), and insulin is no longer accessible to all the members of the public. Furthermore, the Sustainable Development Goals are a total of 17 goals that are, as the United Nations state, “the blueprint to achieve a better and more sustainable future for all”. Although all of the seventeen goals are extremely important for a better future, a future that sees more hope and happiness than the present, it is brought to the attention that the third goal is about good-health and well-being. In total, this goal has 13 targets to hit, a sum of 18 events, 30 publications, and a mind-blowing 714 total actions. In addition, universal health coverage is a value and goal that ensures that people have access to the health care they require, even if their financial status makes it seem difficult

for them to acquire it. It is based on and strives to improve the quality of their coverage by focusing on three pillars; service delivery, health financing, and governance. According to a resolution by the UN in 2015, *Transforming our World*, it is the goal to have adopted this goal in full by a maximum of 10 years from now, by the year 2030.

Key Issues

Rising Prices

Insulin prices have been on a rise ever since they were introduced to the public. The creators of the drug, Frederick Banting and Charles Hbest sold the drug for one dollar in order for a larger variety of the population to have access to it. However, what they had not kept in mind was that prices were inevitably going to rise and cause for a large majority of diabetes patients to suffer, even until their deaths. In 1996, the pharmaceutical company by the name of Eli Lilly priced a one month supply of insulin for roughly 21 US dollars. In recent times, the price for the same vial has considerably risen to 275 dollars. The price escalating is due to various reasons, some in relation to the pharmaceutical companies releasing insulin. To begin with, it is significant to note that there are only three pharmaceutical companies that are in charge of the entirety of the global insulin market. They consist of Eli Lilly, Novo Nordisk, and Sanofi. Considering that they are the primary suppliers of insulin in most countries, they are able to set the prices of the drug to anything they desire. They have the high ground, also known as monopoly, and in other words have an advantage over the countries in need of insulin. Furthermore, the creation of the drug costs more than many think due to the fact that insulin is not a chemically synthesized molecule and rather is a biological product. This additionally means that in production, insulin can not be made generically as other drugs are made. This process of producing biosimilar insulin is very expensive as well as intricate which is additionally why the market for production of biosimilars is quite low. Therefore, as a result of the global insulin market only having 3 main pharmaceutical companies in charge of producing the drug, the monopoly that comes along with that, the cost of production, and no generic insulin, the prices of this essential drug have risen.

Reaction to Prices Going Up

With the rise of insulin prices comes the rise of protests against the major pharmaceutical companies and health organizations around the world, not just third world countries, but most patients around the world share the same anger. One example is in the infamous state of Massachusetts, when a small group of protesters rallied against the pharma company of Sanofi for raising the price of insulin. To prove that the matter of raising the price of insulin is a grave and serious issue, one couple brought the ashes of their child who died due to inadequate access to insulin due to its insanely high cost. This raised awareness that the insulin crisis is affecting all demographics, all ages, and all social classes, meaning it is a global crisis. For the Sanofi brand, its insulin products' cost nearly tripled over an 11 year gap, providing even more sufficient evidence that the rising cost of insulin is simply unfathomable.

Another protest occurred in New York outside Eli Lilly's offices in order to fight back at their rising costs. One protester held a sign saying "I am afraid to turn 26", not knowing what another year of living will cost her, and if it will even be another year, as the prices of insulin are no longer affordable. For the Eli Lilly's brand alone, one dose of insulin's cost rose nearly 1,200% since the 1990s (AJMC 2019).

In addition, with the introduction of the coronavirus and its effects into society's life, it caused many consequences to both the less fortunate and the comfortable. With that being said, there is a large percentage of people who lost their jobs during the beginning of the pandemic and continue to struggle to find a replacement until now. As a side note, a lot of people are trying to ration out their spendings and trying to find ways to cut out unnecessary parts of their lives, or things that they may deem as unnecessary, when in fact, it's life threatening if they do. With what Lebanon has been facing for the past two years and more, most of its population have been facing the dreadful situation of wondering if they have enough money to live another day, and those are the ones who

don't have a death sentence with a disease. Diabetic people, in addition to cancer patients, have to worry about securing medication and treatment every day, and that worry continues to climb, as the currency continues to inflate. That may seem bad enough, but with the electricity cuts, petrol prices rising, and hospitals and pharmacies shutting down, people are being forced to ration out their insulin doses, and in the worst cases, having to use expired vials, which may lead to even more severe medical issues.

Major Parties Involved and Their Views

Insulin: A Monopolized Industry Run By 3 Main Companies

Eli Lilly (U.S.), Novo Nordisk (Denmark), and Sanofi (France) - “dominate more than 90% of the world insulin market by value” - thus allowing them to become billion dollar profiting companies. While all three companies also spend millions of those profits on marketing, they also spend millions on bribing politicians and donate millions to their decision makers in order to remain quiet regarding the price gouging of their Insulin products. Thereby enabling them to continue to have a monopolistic hold on an essential medical product, with little to no competition, and no present regulations for the capping or controlling of their prices.

Insulin Prices in the U.S. vs. in Other Countries:

According to a new RAND Corporation study, in the United States, insulin prices are “eight times higher”, compared to 32 high-income nations. In the United States, the average price per unit of each type of insulin is \$98.70, compared to other countries who would have most likely paid a fraction of that cost for the same types of insulin. Insulin prices in the United States were found to be “3.8 times higher than those in Chile to 27.7 times those in Turkey. U.S. prices were 6.3 times higher than those in Canada, 5.9 times higher than those in Japan and 8.9 times higher than those in the United Kingdom”. The analysis of the study incorporated manufacturers prices in order to discover that the final net prices paid for insulin are more likely to be lower than the manufacturers prices in the United States. This is in regards to the rebates present in the country along with the fact

that insulin discounts have the possibility of driving down the price paid by individuals in the US. However, the study has indicated that even if these discounts reduce insulin prices by 50%, the prices paid by the consumer in the US will still be likely to be “four times the average paid in other high-income nations”. RAND is a non profit research organization, who’s senior policy researcher and lead author for this study, Andrew Mulcahy, has recently said that the analysis provided is the best evidence available regarding the topic of “how much more expensive insulin is in the United States than in other nations around the world”. In addition, even if you assume that in the United States the manufacturer's prices receive steep discounts, the prices of insulin will always be much higher than in other countries. Over the past decade, the prices of insulin in the United States have dramatically increased. For instance, “one federal analysis found that the average U.S. wholesale-acquisition price for rapid-acting, long-acting, and short-acting insulin increased by 15% to 17% per year from 2012 to 2016”. A second study indicated that among adults “with employer-sponsored health insurance”, the annual insulin spending per each adult had doubled between the years of 2012 and 2016, from “\$1,432 to \$2,853 even after accounting for a 50% rebate”. And although when it comes to comparing the ratio of other-country insulin prices to US insulin prices, those prices vary depending on type of and category of insulin along with comparison country, the study has proved that US insulin prices are higher, often being 5 to 10 times higher compared to those in other countries. Furthermore, the study also found out that in the US the prices for analog insulin in comparison to human insulin and “for rapid-acting rather than short or long-acting insulins”, were significantly higher. These prices seemed to become even higher when researchers compared prices by pooling together similar insulin products, therefore suggesting that the US utilizes a “more-expensive mix of insulin products”.

Development of Issue/Timeline

Date	Event	Outcome
1921	Discovery of insulin by Dr Frederick Banting (and student contributors) performed experiments on dogs in relation to the function of the pancreas in relation to the blood sugar content and came to discover how the pancreas helps regulate blood sugar, and called this hormone insulin.	The discover of insulin changed the idea that having diabetes was a death sentence and could be treated.
1923	Frederick Banting refused to put his name on the patent of the first insulin discovered as he felt it was unethical to profit off of a lifesaving drug.	Due to his ethical values, he sold his insulin patent to the University of Toronto for a mere dollar, as he and his co-contributors wanted it to be accessible to everyone, of any demographic.
1963	Marks a milestone as insulin becomes famous for being the first human protein to be chemically produced.	After 40 years of the original discovery of the protein insulin, it became a sign of hope when diabetes was once a death sentence.
1977	First WHO Essential Medicines List includes	Although it has been on the WHO Essential's list for over 40

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		<p>of insulin in times of need. However, if injected at the wrong amount or at a wrong time, it may cause a dramatic drop in blood sugar levels.</p>
<p>1992</p>	<p>As stated by diabetes.co.uk, “Medtronic releases the MiniMed 506 insulin pump, which delivers meal bolus memory and daily insulin totals.” It can be located on either the upper arm or on the lower-abdomen region.</p>	<p>This function of a healthy pancreas. Although life-saving medical device, its cost is deadly for patients without insurance. On average, it can cost between \$4,500 to \$6,500, which for third-class patients, can be up to a third of their yearly salary, and for people countries, combined salaries of many years.</p>
<p>1996</p>	<p>Eli Lilly, the brand that manufactured Humuli, introduces Humalog, which distributes analogue insulin.</p>	<p>Since analogue insulin can be genetically altered and has a faster reaction. In addition, it is thought that analogue</p>

is better than human insulin in the sense that it has a faster absorption rate, hence a faster

reaction in

which

		functions of insulin and the pancreas as if the person didn't suffer from diabetes.
2016	In the U.S. alone, the average price of insulin per month reached \$450, and the costs continued to rise. This led to as much as a fourth of the diabetic American population to start rationing and skipping certain doses.	Former Director-General of the World Health Organization stated that due to the lack of affordable "people with diabetes who depend on life-saving insulin pay the ultimate price when access to affordable insulin is lacking" .

Previous Attempts to Solve the Issue

U.S. and the ADA

In the last quarter of 2016, members of Congress called for a question on whether or not insulin manufacturers are coordinating on prices for their products. Later on that same month, the ADA (or the American Diabetes Association) passed a resolution calling on Congress to investigate the rapid increase of insulin prices, focusing on the decade that passed. In that resolution, the ADA is asking for Congress to reveal everything, from “the drug companies down to the pharmac[ies]—and to reveal how prices are set, to find out why they have climbed so high, and to make sure that patients who need insulin can get it”. Plus, although it is known that the healthcare system in the United States does not give its citizens justice, it is revealed that insulin prices in the country are six times higher than the insulin prices in Europe. Hence, this resolution called for ““all the entities in the insulin supply chain,’ including the drug manufacturers, the wholesalers, the pharmacy

benefit managers, payers, and pharmacies to increase transparency, and to ensure that no patient is denied access.”

Previous World Health Assembly Statements and Call to Actions

Ever since the establishment of the essential medical list in the 1970s, it has been known worldwide and a primary issue that the UN and the WHO faces when it comes to the affordability and accessibility of insulin for diabetic patients.

The WHO exposed that the main reason for such high pricing and accessibility is the fact that only 3 major companies control the market for insulin doses, and delivery devices for insulin, and other devices that the patients use, are relatively scarce and hard to find at an affordable price in many countries around the world. With that being said, the WHO launched an insulin prequalification initiative in November 2019, to ensure quality control for more insulin brands entering the market, giving now more choices for the countries and patients, with likely decreased prices, thus providing better access. In addition, the Director of the Department of Noncommunicable Diseases at WHO, Dr. Bente Mikkelsen stated that, “A key aim of the Global Diabetes Compact is to unite key stakeholders from the public and private sectors, and, critically, people who live with diabetes, around a common agenda, to generate new momentum and co-create solutions.”

Possible Solutions

Addressing the Rising Cost of Insulin

Although the discovery of insulin occurred in the early 1920s, the prices of it a century ago and the price of it now is astonishing. Rising from a mere dollar to around \$435 for an insulin in America, a rise of over 43,500% (at the highest price point), over a span of 100 years.

Domestic Government Economic Intervention

One solution is to limit price increases as drug companies usually take advantage of the market, and can increase and decrease their prices whenever they choose to. In order to limit the unfair raising of prices, a universal maximum price of insulin can be set

in stone as well as ensuring that insurance companies will always help diabetic patients to secure their insulin doses. In addition, to help with that, each nation's government can provide subsidies in order to reduce the cost of insulin and help keep it in the market/.

International NGO Support

In addition, insulin companies can work hand-in-hand with NGOs and nonprofits to secure insulin vials to patients that do not have access to insurance and usually have to face the high prices of the market.

International IGO Support

Furthermore, we can suggest to the WHO to help support and fund organizations like *TI International*, in order to help diabetic patients in the long run and help them with their specific needs. The founder of this organization stated that their plan includes “real-life advocacy case studies and is made up of five sections to guide the user through various stages of the process, including goal setting, planning your action, ways to take action and put pressure on the target, and evaluate your efforts”. In addition, any diabetic patient can find this target sheet online for free, making it easier and cheaper for them to start out their journey in trying to fight against the unjust system.

Work Cited:

“Analogue Insulin Is a Sub-Group of Human Insulin. Analogue Insulin Is Laboratory Grown but Genetically Altered to Create Either a More Rapid Acting or More Uniformly Acting Form of the Insulin.” *Diabetes*, 14 Feb. 2020, www.diabetes.co.uk/insulin/analogue-insulin.html#:~:text=Analogue%20insulin%20is%20a%20sub,advantages%20for%20blood%20sugar%20management.

Belluz, Julia. “The Absurdly High Cost of Insulin, Explained.” *Vox*, Vox, 3 Apr. 2019, www.vox.com/2019/4/3/18293950/why-is-insulin-so-expensive.

“The Discovery and Development of Insulin as a Medical Treatment Can Be Traced Back to the 19th Century.” Diabetes, 11 Mar. 2020,
www.diabetes.co.uk/insulin/history-of-insulin.html.

“Diabetes.” *World Health Organization*, World Health Organization,
www.who.int/health-topics/diabetes#tab=tab_1.

Caffrey, Mary. “ADA Resolution Asks Congress to Investigate INSULIN PRICES.”
AJMC, AJMC, 30 July 2020,
www.ajmc.com/view/ada-resolution-asks-congress-to-investigate-insulin-prices.

Higuera, Valencia. “About Insulin: What It Is, How It Works, and More.” Healthline,
Healthline Media, 7 May 2019,
www.healthline.com/health/type-2-diabetes/insulin#diabetes.

Laing R;Waning B;Gray A;Ford N;t Hoen E; “25 Years of the WHO Essential Medicines
LISTS: Progress and Challenges.” *Lancet* (London, England), U.S. National Library
of Medicine, pubmed.ncbi.nlm.nih.gov/12767751/.

“Managing Dawn Phenomenon with Basal Insulin.” Diabetes Strong, 22 Mar. 2020,
diabetesstrong.com/managing-dawn-phenomenon-basal-insulin/.

“Types of Insulin.” Types of Insulin | Michigan Medicine, 31 Aug.
2020, www.uofmhealth.org/health-library/aa122570.

“Who Officer Speaks Candidly about Insulin Crisis.” Diabetes Voice, 12 Dec. 2019,
diabetesvoice.org/en/advocating-for-diabetes/who-officer-speaks-candidly-about-insulin-crisis/.

Beran, David & Lazo, Maria & Mba, Camille & Mbanya, Jean Claude. (2021). A
global perspective on the issue of access to insulin. *Diabetologia*. 64.
[10.1007/s00125-020-05375-2](https://doi.org/10.1007/s00125-020-05375-2).

World Health Organization (2016) Global report on diabetes. World Health Organization, Geneva

“Insulin Therapy: Side Effects, Myths, and Tips.” Medical News Today, MediLexicon International,
www.medicalnewstoday.com/articles/323387#:~:text=Insulin%20shots%20cause%20the%20cells,dizziness.

“How Much Does an Insulin Pump Cost?” *CostHelper*,
health.costhelper.com/insulin-pump.html#:~:text=Typical%20costs%3A,and%20size%20of%20the%20pump.

Melo, Karla F. S., et al. “Short-Acting Insulin Analogues versus Regular Human Insulin on Postprandial Glucose and Hypoglycemia in Type 1 DIABETES MELLITUS: A Systematic Review and Meta-Analysis.” *Diabetology & Metabolic Syndrome*, BioMed Central, 3 Jan. 2019,
dmsjournal.biomedcentral.com/articles/10.1186/s13098-018-0397-3.

“Universal Health Coverage.” World Bank,
www.worldbank.org/en/topic/universalhealthcoverage.

Purgato, M., and C. Barbui. “What Is the WHO Essential Medicines List?” *Epidemiology and Psychiatric Sciences*, U.S. National Library of Medicine,
[www.ncbi.nlm.nih.gov/pmc/articles/PMC6998134/#:~:text=The%20WHO%20essential%20medicines%20list%20\(EML\)%20is%20a%20register%20of,evidence%2Dbased%20and%20rational%20prescribing.](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6998134/#:~:text=The%20WHO%20essential%20medicines%20list%20(EML)%20is%20a%20register%20of,evidence%2Dbased%20and%20rational%20prescribing.)

“Take Action for the Sustainable Development Goals – United Nations Sustainable Development.” United Nations, United Nations,
www.un.org/sustainabledevelopment/sustainable-development-goals/.

“THE 17 GOALS | Sustainable Development.” *United Nations*, United Nations, sdgs.un.org/goals.

Tsaplina, Marina, et al. “We Won't Stop Fighting for Affordable Insulin.” *Diabetes Voice*, 26 Sept. 2019, diabetesvoice.org/en/advocating-for-diabetes/we-wont-stop-fighting-for-affordable-insulin/.

“A History of Universal Health Coverage in the UN.” UHC2030, www.uhc2030.org/un-hlm-2019/a-history-of-universal-health-coverage-in-the-un/.

“Why Research & Development.” Global Health Technologies Coalition, www.ghtcoalition.org/why-research-and-development.

“Primary Health Care.” World Health Organization, World Health Organization, www.who.int/health-topics/primary-health-care.

“The Primary Health Care Approach.” Canadian Nurses Association, www.cna-aiic.ca/-/media/cna/page-content/pdf-en/fs02_primary_health_care_approach_june_2000_e.pdf?la=en&hash=C31F23CD20366955F267C04D737B32163F7D5623.

“Noncommunicable Diseases.” World Health Organization, World Health Organization, www.who.int/health-topics/noncommunicable-diseases#tab=tab_1.

“Low-Income Countries.” World Population Review, worldpopulationreview.com/country-rankings/low-income-countries.

Pfiester, Elizabeth. “Tools to Tackle the Global Insulin Crisis.” *ASweetLife*, ASweetLife, 15 Aug. 2017, asweetlife.org/tools-to-tackle-the-global-insulin-crisis/.

Battino, Gabby. “Policy Solutions to Address the Rising Cost of Insulin.” NCHC, 21 July 2020, nchc.org/policy-solutions-to-address-the-rising-cost-of-insulin/.

27, Hyacinth Empinado Nov., et al. “A Protest over Insulin Prices Is Seen as a Fight for Life.” STAT, 22 Feb. 2019,
www.statnews.com/2018/11/27/insulin-prices-protest-sanofi/.

Mulcahy, Andrew W. “Insulin Prices Are Dramatically Higher in the United States than in Other Countries.” RAND Corporation, 6 Oct. 2020,
www.rand.org/news/press/2020/10/06.html.

“Changing the Game to Improve Availability and Affordability of Quality-Assured Insulin and Associated Devices.” World Health Organization, World Health Organization,
www.who.int/news/item/25-09-2020-changing-the-game-to-improve-availability-and-affordability-of-quality-assured-insulin-and-associated-devices.

“New Who Global Compact to Speed up Action to Tackle Diabetes.” *World Health Organization*, World Health Organization,
www.who.int/news/item/14-04-2021-new-who-global-compact-to-speed-up-action-to-tackle-diabetes.

“8 Reasons Why Insulin Is so Outrageously Expensive.” T1International,
www.t1international.com/blog/2019/01/20/why-insulin-so-expensive/.

Tseng, Chien-Wen, et al. “Impact of Higher INSULIN Prices On out-of-Pocket Costs in Medicare Part D.” *Diabetes Care*, American Diabetes Association, 1 Apr. 2020,
care.diabetesjournals.org/content/43/4/e50.

Cohen, Joshua. “Insulin's out-of-Pocket Cost Burden to Diabetic Patients Continues to Rise despite Reduced Net Costs To PBMs.” *Forbes*, Forbes Magazine, 5 Jan. 2021,
www.forbes.com/sites/joshuacohen/2021/01/05/insulins-out-of-pocket-cost-burden-to-diabetic-patients-continues-to-rise-despite-reduced-net-costs-to-pbms/?sh=3a35d94440b2.

Define_me, [www.mayoclinicproceedings.org/article/S0025-6196\(19\)31008-0/fulltext](http://www.mayoclinicproceedings.org/article/S0025-6196(19)31008-0/fulltext).

Appendix

A few helpful websites to help with creating possible solutions and to look at how countries are dealing with the rise of diabetes:

- <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/existence-of-operational-policy-strategy-action-plan-to-reduce-unhealthy-diet-related-to-ncds->
- [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/general-availability-of-diabetes-testing-\(by-blood-glucose-measurement-ogtt\)-at-the-primary-health-care-level](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/general-availability-of-diabetes-testing-(by-blood-glucose-measurement-ogtt)-at-the-primary-health-care-level)

For some quick facts about diabetes and calls to action from the WHO, read the following:

- <https://www.who.int/news/item/25-09-2020-changing-the-game-to-improve-availability-and-affordability-of-quality-assured-insulin-and-associated-devices>
- <https://www.who.int/news/item/14-04-2021-new-who-global-compact-to-speed-up-action-to-tackle-diabetes>

