Diabetes, Insulin Treatment, and International Human Rights Law: Upholding the Right to Health During a Global Insulin Crisis

Ghalia Estaiteyeh
College of William and Mary

Abstract

There is great disparity in the availability of medications for communities across the globe. Accessibility varies from person to person, and for some, these differences can mean life or death. In a world of international human rights regulations that seek to protect people from preventable injustice and harm, these discrepancies are simply unacceptable. This article seeks to address the growing problem of global insulin inaccessibilty. It considers the importance of this accessibility in upholding two rights codified in international human rights law instruments: the right to the highest attainable standard of health and the right to the benefits of scientific progress. Drawing from healthcare mechanisms in India and South Africa, as well as from recommendations made by the World Health Organization, this article finds the best solutions to insulin and pharmaceutical inaccessibility to be state-specific. Furthermore, solutions should support initiatives that create biosimilars, support generics, and encourage innovation globally, rather than solely within the Western world. These solutions, however, must find a balance among equal, accessible innovation, protection of intellectual property, and overall human rights considerations—with people being prioritized over profits.

Introduction

In January 1923, three researchers were awarded a patent for their development of what is now known as insulin. These researchers—Frederick Banting, J.B. Collip, and Charles Best—sold their patent for one dollar each and assigned their rights to the University of Toronto (Rosenfeld, 2002). The purpose of their actions was to ensure accessibility of insulin research development to both patients and future scientists. The researchers believed that affordability of insulin would improve over time, and that the drug would subsequently be distributed to the greater population. As insulin entered mass production, however, this ideal was not achieved.

Currently, over 371 million individuals worldwide are diabetic, and about half remain undiagnosed. Moreover, many who are diagnosed do not receive proper treatment for their diabetes due to a lack of access to insulin (International Diabetes Federation, n.d.). The average cost of insulin in the United States, for example, is an estimated $274 per vial. This amount has increased steadily over time: the price of insulin has risen by 1,123 percent since 1996 (Popken, 2017). Not only are advances in insulin treatment commonly inaccessible, but knowledge of insulin's existence itself is often absent. In some global settings, outdated, non-insulin based practices are used to treat diabetic patients, often leading to greater harm to a person's health. The insulin crisis is deeper than assumed—in some cases, diabetic individuals cannot access information about the existence of insulin treatments, let alone purchase the drug itself.

It is also important to note the intersectionality of the social disparities involved in diabetes diagnoses and medical inaccessibility. Medical inaccessibility is heavily intertwined with differences in class, gender, race, and ability, and tends to affect marginalized groups most strongly. Additionally, the likelihood of development of some forms of diabetes is impacted by factors such as lifestyle, access to nutrition, and stress levels. Once a person develops diabetes and receives a diagnosis, geopolitical factors have a significant influence on the issue of insulin accessibility (Hsu, 2012).

The global insulin crisis is not necessarily rooted in the objective availability of insulin. The Office of the High Commissioner for Human Rights reports that Novo Nordisk, an insulin-producing company, is responsible for providing insulin for half of the entire world. In order to ensure that this insulin is accessible, Novo Nordisk implemented "differential pricing policies:" in recent years, diabetic individuals in developing countries have paid one-fourth of the price charged for insulin in developed countries (United Nations OHCHR, 2015). Though a helpful initiative in theory, problems arose when individual states were allowed to regulate the system. Poor governance and inefficient health systems within different countries have contributed to disparities in insulin accessibility and affordability. Additionally, the price of insulin is inevitably increasing due to "upgrades" and adjustments added to each new formulation of the

drug. Companies who create these "upgraded" versions of insulin subsequently upcharge for both the old and new
. This pricing trajectory has
increased exponentially over time, as shown
in Figure 1.

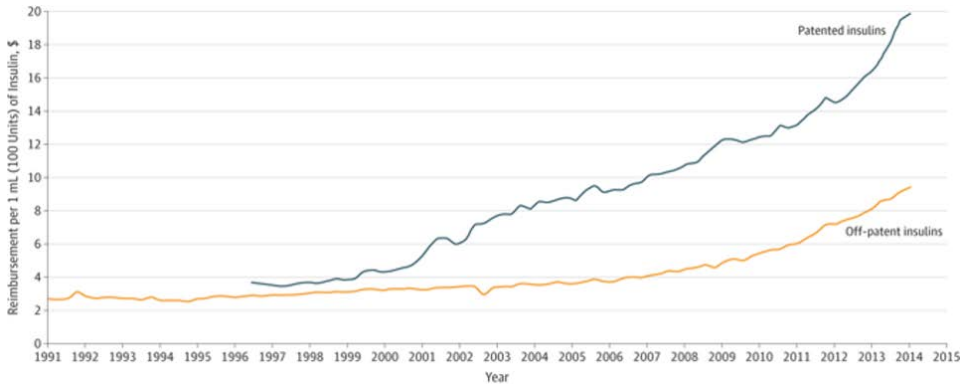

FIGURE 1. Cost trajectory for patented insulins in comparison to off-patent insulins (Ubel, 2016).

In order to properly address the growing diabetes epidemic, as well as to combat global suffering
caused by treatment inaccessibility, it is
useful for science and technology studies (STS) to critically assess medical treatment accessibility guidelines set by international law. Though international human rights law mechanisms seek to uphold specific minimum standards with regards to medical treatment rights, these standards
are often routinely violated.

This article aims to bridge the gap between discussions of insulin accessibility and international human rights law provisions, while providing innovative solutions to this pressing issue. Although there existing STS literature addresses pharmaceutical corporations and their
obligations under international law generally, this paper applies existing theories to the case of insulin specifically
. It also offers
possible solutions which can not only alleviate insulin inaccessibility,

but do so within the scope of an international human rights framework that empowers beneficiaries in the process.

This article argues that individuals have a human right to access insulin, and that this is a legal right codified in international law. A number of international treaties, declarations, official comments, and state practices clearly outline the responsibility that nations, and the global community as a whole, have to provide individuals with the highest possible standard of health and accessibility to the benefits of scientific discovery. The dismal state of insulin accessibility today contradicts the very principles that these international instruments are founded upon and must be addressed using available human rights mechanisms.

Section 1: UN Human Rights Framework

The United Nations and member states have developed a plethora of treaties, declarations, official interpretations, and state practices regarding the human right to health. These instruments set specific standards for states and non-state entities in terms of obligations to respect, protect, and fulfil the right to health through health treatment accessibility and other means. The UN Office of the High Commissioner for Human Rights (OHCHR) in particular has released very specific material pertaining to health and medical progress that can be applied to the issue of insulin inaccessibility.

The most fundamental international law instrument in relation to insulin inaccessibility is the International Covenant on Economic, Social, and Cultural Rights. This covenant is an international treaty that is legally binding on all states and the parties and actors within their jurisdictions. It was adopted by the United Nations' General Assembly in 1966, and entered into legal force in 1976. This treaty outlines inalienable rights that individuals are entitled to worldwide. As of 2015, there are 164 state parties to the Covenant. Several countries, including the United States, have signed on, though not ratified, the Covenant (International Covenant, 1976). Article 12 of the Covenant specifically summaries the human right to health, stating: "the States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health." Article 12 goes on to outline the precise steps that states must take in order to ensure that this right is upheld, including reducing infant mortality, improving environmental conditions, treating and preventing various diseases, and facilitating medical services in times of illness. While reading this article, it is critical to consider the specific language used. The article does not merely state that everyone has the right to physical and mental health; rather, it emphasizes the *highest attainable standard* of physical and mental health. This gives states less leeway to justify sub-standard health treatments, and does not allow them to dismiss novel healthcare initiatives on the basis of "sufficient" population health. Instead, the article holds states to a higher standard, while at the same time considering the diverse circumstances that each

state may be working within. The specific language of the article, which targets particular health crises such as infant mortality and industrial hygiene, shows that the Covenant has clear, concise goals with regards to what implementing this article should look like. Additionally, its specificity makes it much easier to see the extent to which states fall short of global human rights expectations.

Even more detailed in its discussion of the human right to the highest attainable standard of health is General Comment No. 14, issued by the Committee on Economic, Social, and Cultural Rights, the authoritative interpreter of the Covenant. This general comment expands upon Article 12 of the Covenant by laying out the legal obligations of state parties, and explains more precisely what the "right to the highest attainable standard of health" entails for states. The general comment cites other documents which affirm the right to health and medical care, discusses initiatives and programs which act to improve healthcare globally, and proactively pushes for health policy reform.

In regards to insulin accessibility, several of General Comment No. 14's are particularly salient. Availability and accessibility are distinctly addressed in Section I, Paragraphs 12a and 12b, respectively, of the Comment. Paragraph 12b is intricate in its explanation of accessibility, mapping out four dimensions that constitute accessibility—non-discrimination, physical accessibility, economic accessibility (or affordability), and information accessibility (UN OHCHR Committee, 2000). This paragraph heavily emphasizes the inequalities facing socially underprivileged groups, and the class disadvantages which play so heavily into the accessibility of medications like insulin.

Additionally, Section II, Paragraph 33 lists three levels of obligations that states are responsible for with regards to population health—respecting, protecting, and fulfilling the right to health. Paragraph 35 expands upon the obligation of states to protect the right to health, by adopting legislation, encouraging policy reform, and providing services which ensure equal access to health care. Moreover, the state is obligated to ensure that privatization does not negatively affect accessibility and availability of health services and medication.

This comment on privitization is one that is often overlooked by states, especially when considering insulin. Insulin is a drug that cannot easily be replicated and distributed, and the resulting privatization and monopolization of the treatment has caused ongoing increases in price. This price hike underlies much of the inaccessibility occurring in the world. Present-day privatization and pricing directly contradict the regulations that General Comment No. 14 provide. More specifically, the aforementioned Section I, Paragraph 12b explicitly states that treatments and services must be "whether privately or publicly provided…affordable for all, including socially disadvantaged groups." With these clear requirements in mind, it is surprising to see how the current state of insulin

treatment in the global market violates the legal commitments of states so starkly.

Finally, as highlighted by the United Nations' Special Rapporteur in the field of cultural rights, the right to benefit from scientific progress is codified in both the Universal Declaration of Human Rights and the International Covenant on Economic, Social, and Cultural Rights (UNGA Human Rights Council, 2012). The Special Rapporteur expands upon these points by calling upon states to cooperate internationally in sharing the benefits of new sciences and technologies. The promotion of new medications is one way through which the benefits of scientific progress can be disseminated and exchanged. In the Special Rapporteur's report, the example of pediatric HIV medications is cited as an example in which, due to innovation and negotiation of lower prices, impoverished groups eventually gained sufficient access to treatment. This methodology should apply just the same in discussions of worldwide access to insulin for diabetic patients. Ultimately, the right to benefit from scientific progress is heavily intertwined with the right to health, among other human rights, including the right to non-discrimination.

Given the plethora of documents and legal regulations provided by the international community which promote equal health and medical progression, it is clear that states are either incapable of upholding an international standard of health, inefficient in their methods, or unwilling to do what it takes to secure better health conditions in their countries. Regardless, the current global insulin crisis is representative of the failure of states, collectively, to uphold the right to the highest attainable standard of health, and is a grave violation of international human rights law.

Section 2: Case Studies on the Right to Health

In order to further probe the discussion of the global insulin crisis, it is instructive to look at specific states, and assess their progress or shortcomings in alleviating insulin inaccessibility for their citizens. Case studies provide helpful, detailed analyses of states' behaviors in dealing with diabetes treatments, which can help in developing potential solutions. While a deeper study of the distinct histories and political economies of these case studies is outside the scope of this article, the brief investigation of the poor historical records in these cases in caring for diabetic citizens provides important insight for our analysis.

The Case of the Republic of Moldova

Moldova is one of the 164 state parties to the International Covenant on Economic, Social, and Cultural Rights (International Covenant, 1976). Yet, as of 2017, Moldova's track record in addressing and caring for its diabetic citizens is considerably deficient. According to a report released by the UN Committee on Economic, Social, and Cultural Rights' Pre-sessional Working Group, Moldova has "failed to deliver on its human rights obligations in the field of healthcare for people living with diabetes"

(International Covenant, 2017). Moldova's inadequate care for its diabetic citizens was reported by the DIA Association of Young People Living with Diabetes, who detailed the statistics and policies of Moldova's health programs to the UN Working Group on Universal Periodic Review in 2016.

Currently, 80 percent of the Moldovan public perceives the right to health to be the right most frequently violated by the state. This is the result of multiple factors: corruption, lack of healthcare professionals, and inaccessibility to facilities and treatments for disease. Insulin treatment constitutes a great portion of this inaccessibility (International Covenant, 2017). According to DIA, access to insulin analogues is severely low within the country. Only 9 percent of insulin-dependent patients have access to these analogues, which are a fairly basic, yet necessary, treatment for diabetic patients (International Covenant, 2017). Statistics provided by DIA show that a mere 1,350 out of 15,000 patients received insulin analogues within Moldova in 2014—a severely low ratio. Meanwhile, the Moldovan state pledged to uphold a 70 percent ratio when it committed to the 2011-2015 National Diabetes Program (International Covenant, 2017). These numbers have severe implications, particularly considering that the number of individuals diagnosed with diabetes doubles every decade, and that diabetes is responsible for a growing number of deaths within the country annually (Committee on Economic, Social and Cultural Rights, 2017).

As mentioned previously, there are a few reasons for the lack of insulin analogues provided to Moldovans. There are extensive restrictions on access to insulin analogues as regulated by the Ministry of Health. Some of these restrictions also constrain the ability of insulin analogues to be redistributed, thus making access to insulin even more difficult for the Moldovan population. As the poorest country in Europe, the Moldovan state is clearly failing to provide proper medical treatments for its people. The state, then, inevitably ends up relying upon foreign support and financing to compensate for this. Even in this regard, though, state efforts remain lacking—Moldova's Ministry of Health has requested insulin analogues from the UN Development Program at a rate 24 percent lower in 2017 than in 2016 (International Covenant, 2017). This is simply unacceptable given the exponential rise of the disease within the country.

According to testimonies by various individuals within Moldova, age and gender discrimination plays a key role in insulin accessibility within the country. Certain regulations by the Ministry of Health perpetrate discrimination against diabetic citizens going through puberty, for example, and end up barring them from insulin analogue treatment (International Covenant, 2017). This blatantly undermines Article 12 of the International Covenant on Economic, Social, and Cultural Rights' section on non-discrimination and equal treatment, which stresses the prohibition of "any discrimination in access to health care…on the grounds of race, colour, sex, language" (UN OHCHR Committee, 2000).

Article 12's segment on children and adolescents also recognizes that, "children and adolescents have the right to the enjoyment of the highest standard of health" (UN OHCHR Committee, 2000). The Moldovan state's lack of action, and perpetration of discriminatory regulations, openly contradicts its supposed commitment to upholding the highest attainable standard of health for its people, as a party of the International Covenant.

Moldova's insulin shortage, and overall shortage of affordable healthcare provisions, has caused its diabetic citizens to face to inhumane choices in order to ensure their own day-to-day survival. DIA reports that an estimated 200,000 Moldovans who suffer from chronic disease must choose between purchasing food and purchasing essential medications, such as insulin (Committee on Economic, Social and Cultural Rights, 2017). These living conditions not only violate Article 12 of the International Covenant on Economic, Social, and Cultural Rights, but also violate Article 11, which upholds every individual's right to an adequate standard of living (International Covenant, 1976). The Moldovan example makes it clear that deprivation of the right to the highest attainable standard of health ends up depriving individuals of other basic human rights, contributing to a domino effect.

The Moldovan case is also unique in that the country's insulin inequalities have been directly addressed by the UN. The vast majority of states facing insulin and greater medical disparities are usually not specifically confronted and targeted for their violation of the right to the highest attainable standard of health. Most, if not all, of the remaining states remain unacknowledged in regards to their repeated violations of international human rights law. They are repeat offenders in disregarding, and being complacent in, worsening insulin inaccessibility within their borders. This raises the critical question: why are so few states called out?

Although it may seem to be the case that developing nations like Moldova are faced with greater insulin accessibility disparities, this is not necessarily true across the board. The United States, along with other developed, Western nations, is assumed to have a stronger infrastructure, more effective healthcare systems, and progressive medical technologies distributions. Even given these advantages, the West, and the U.S. in particular, suffer from staggering numbers of civilians with diabetes. Yet, insulin accessibility is still hauntingly present, even, and especially in, a developed nation such as the United States.

The Case of the United States

The United States faces a unique set of problems when it comes to healthcare. A recent Reuters analysis reported that the U.S. pays as much as seven times more than the United Kingdom for the same drugs (Johnson, 2016). The structure of the U.S. healthcare system, coupled with its particular relationship with pharmaceutical companies, puts patients in a financially vulnerable position. The United States also lacks a generic

insulin market: any attempts at releasing generic formulation face harsh backlash, as well as possible legal repercussions, from the major pharmaceutical companies who manufacture brand-name insulin within the United States.

This strain of insulin inaccessibility is due in part to the unique position that the United States has in funding drug development and the policies regulating pharmaceutical profits. According to Steve Miller, a chief medical officer for Express Scripts (a middleman pharmaceutical company), the United States makes up between 50 to 70 percent of the world's drug profitability (Johnson, 2016). Insulin is no exception to this statistic. Unfortunately, these prices tend to disproportionately affect those who are most disadvantaged.

One of the most disturbing recent cases of insulin inaccessibility in the United States is that of Shane Patrick Boyle, who died in the March of 2017 due to diabetes complications. He developed diabetic ketoacidosis (DKA), a often-fatal condition resulting from the body's inability to distribute glucose (Higgs, 2017). DKA is almost always caused by insufficient amounts of insulin in the body.

Boyle's death was not random. It was the result of months of prolonging his insufficient insulin supply by stretching it thin due to his incapability to afford the proper monthly supply. Boyle started a GoFundMe campaign to fund his required monthly supply of insulin, which came out to a cost of $750. He fell just $50 short of his goal, and was unable to pay for the next month's supply. After rationing his insulin as long as he could, Boyle had completely depleted his supply. He succumbed to diabetic ketoacidosis, and passed away (Higgs, 2017).

The story of Shane Patrick Boyle is utterly tragic, but it is not an isolated incident. Many diabetic patients have suffered immensely as a result of skyrocketing insulin prices. It is unfortunately common to hear of diabetic individuals who are forced to ration their insulin supplies, or skip meals, in order to afford their medication for the month.

Gabriella Corley, a fourth-grader from West Virginia, faces a similar situation. Her family lives paycheck to paycheck and is often unable to afford her monthly insulin costs. As a result, they have frequently gone days without electricity or food to guarantee that Gabriella has enough insulin to survive. Their daughter's survival, then, becomes a balancing act of choosing between basic necessities. Gabriella's mother, Andrea Corley, explains: "I have to beg, plead, and borrow just to survive each month…I will go without eating if I have to, to make sure she is healthy and happy" (Popken, 2017).

These dire situations are unquestionable violations of international human rights law. It is unacceptable for patients to have to resort to desperate measures and conditions just to access vials of insulin. Patients and their families in these situations are often forced to deprive themselves of one basic necessity to secure another. Not only does these conditions violate Article 12 of the International Covenant on Economic, Social, and

Cultural Rights, they also deeply undermine many of the details listed in the Covenant's General Comment No. 14. These circumstances further violate Article 11 of the Covenant, which outlines the right of everyone to adequate housing and food. Finally, this deprivation of adequate living conditions, which has ensued for families with diabetes across the United States, undermines Article 25 of the Universal Declaration of Human Rights, which establishes that everyone has the right to an adequate standard of living (UN General Assembly, 1948). It is clear that the living conditions of many diabetics in the United States constitutes a plethora of human rights violations. It may even come as a surprise, in such an ostensibly advanced nation that seems to value basic rights and liberties, to see the reality of medical accessibility manifest so harshly.

Indeed, the desperate need for insulin affordability and accessibility is not unique to the United States. However, the United States' distinctly complex healthcare system, and relationship with insurance companies and medical middlemen, only complicates conditions, hikes up insulin prices, and makes applicable solutions less attainable. Strict U.S. regulation policies, and the influence of "Big Pharma" insulin companies in suppressing the innovation of generic brands, further stifle the insulin market (Tucker, 2015). The United States is also an important case to take note of due to its status as a "developed" country, with widespread modern medicine methods and mechanisms in place.

The enforcement of treaties and human rights regulations is complicated by other dynamics that come into play in specific countries. As will be further discussed, the United States faces conflicts between balancing its human rights and insulin accessibility obligations with its intellectual property laws. Meanwhile, Moldova seems to be facing a backlash from the United Nations in its disregard of international treaties, and although treaty enforcement regulations have been attempted, states can seemingly ignore implementation easily, particularly when dealing with such an indirect and nuanced case as insulin accessibility.

Solutions

It is clear, then, that insulin inaccessibility is both widespread and indiscriminate, manifesting differently within the global playing field, yet severely and consistently affecting a range of nations and peoples. With such a wide array of individuals and states plagued by insulin inaccessibility, it is difficult to narrow the scope of solutions and pinpoint effective methods that could potentially be universally applied. Thus, creating state-specific solutions, which target the precise issues each country may be facing, seems to be most efficient. This approach ensures that solutions are culturally aware and work within the distinct sociopolitical conditions of each state.

When developing solutions, it is crucial to grasp the importance of the way health innovation is framed. Researchers and experts in public health and pharmaceutical development tend to categorize regions using a very

developmental lens—Western nations are characterized as beacons of innovation, while those in the "Global South" are framed only as sources of raw materials and consumers of Western products. This framework, however, is an oversimplification. In South Africa, startups like iThemba Pharmaceuticals have made significant developments in drug discovery. They aim to create their own pharmaceuticals for illnesses like HIV and tuberculosis (Pollock, 2014). Organizations like iThemba are a constant reminder that the way that pharmaceuticals and medical innovation are framed must be reconsidered in order to achieve the best possible results. Although nations are often defined by their geographical locations, histories, and wealth, global health work needs to ensure it is not marginalizing and dismissing novelty that challenges historic Western domination of certain patent regimes.

On the other hand, the relationship between pharmaceutical innovation and developing countries can manifest in an entirely different, complex, and harmful way. Joseph Dumit cites the research of Kaushik Sunder Rajan, who studies how pharmaceutical companies outsource their industry, particularly by recruiting rural, working class civilians in India to participate in clinical trials (Dumit, 2012) This process raises numerous ethical and human rights related questions. While clinical trials are necessary in pharmaceutical research, the reliance on global networks and volunteers can become exploitative. The layered question of how pharmaceutical companies may participate in global exploitation and uneven power dynamics to further innovation, and how this intersects with drug accessibility and international human rights law, is an area for further research.

Generics in India and Beyond

India has a "vibrant generic market" in regards to medicine. An estimated 90 percent of its medical market is made up of generic products. Yet, these same numbers do not apply when it comes to insulin. A vast majority of India's insulin market is still controlled by the "big three" insulin manufacturers—Novo Nordisk, Eli Lilly, and Sanofi Aventis. The inefficiency of the Indian industry in marketing and manufacturing generic insulin greatly contributes to the unaffordability of insulin within the nation. Individuals see generic insulin as "sub-standard," and perceive the insulin manufactured by large pharmaceutical companies to be of better quality (Dumit, 2012).

To combat this, Biocon, an Indian generic producer, has partnered with Pfizer, a U.S. pharmaceutical company, to develop a marketing campaign and commercialize generic insulin. Because of Pfizer's status as a large pharmaceutical company, Biocon's generic insulin will be seen as "branded," thereby diminishing negative perceptions of generic insulin and alleviating any quality concerns (Dumit, 2012).

Although this is a useful solution in the Indian case, it is unclear how this method would play out in other countries. For example, in more

resource-poor nations, the regulation of insulin production by state agencies is simply not an option. Many states do not have the means to produce and regulate their own insulin, nor do they have the resources to ensure that the generic insulin they receive is consistent (Dumit, 2012). This becomes a very suffocating dilemma for less wealthy states with high rates of diabetes, as well as insulin inaccessibility.

The World Health Organization (WHO) has attempted to alleviate concerns towards the reliability of generic medicines in the past, especially in regards to HIV/AIDS, malaria, and tuberculosis medications. The WHO has successfully established a prequalification scheme, which screens medication producers and ensures that they meet the thresholds for reliable medicine prior to distribution (Beran, 2011). This methodology has succeeded in reassuring countries and their citizens about generic treatments, and can be applied to generic insulin as well. In countries where regulatory institutions are not capable or available, the WHO's prequalification solution may be most effective.

Biosimilars and Further Innovation

Generic production is also a tentative solution for the United States. However, limitations arise when applying both domestic and international intellectual property law to the equation. Patents and agency regulations tend to confine insulin innovation, especially in the United States. Most recently, "biosimilar" insulin products have been on the rise. These insulin formulas are not generic drugs because they do not use identical formulas. Instead, biosimilars use comparable manufacturing methods to create a formula that is similar in chemical compostion and efficacy to branded formulations (Beran, 2011).

Lilly and Boehringer Ingelheim attempted to create a biosimilar insulin strain, and intended to distribute this strain within the United States. Unfortunately, their project was halted after facing a lawsuit from Sanofi Aventis in mid-2016. Sanofi's lawsuit claimed patent infringement and has prevented the biosimilar insulin from further approval indefinitely (Tucker, 2015).

To ensure innovation and work around the potential patent infringements that challenge biosimilar insulin initiatives, Teva Pharmaceutical Industries, Ltd., a global generic-drug maker based in Israel, is moving past insulin. They hope to develop a form of therapy that would prevent the immune system from destroying insulin-producing cells, overcoming the need for insulin treatment entirely (Connolly, n.d.) By pursuing this unique treatment method, Teva removes the possibility of infringing upon any other pharmaceutical companies and patents, and avoids any imminent competition, as well.

Global Distribution Methods

The WHO has suggested several answers to the question of insulin inaccessibility. One such answer, particularly for resource-poor countries,

is the notion of bulk tendering. This is a method that has been applied already in Caribbean states, and entails a group of nations joining forces in the market, enabling larger quantities of medicine to be ordered and accessed at better prices. Bulk tendering increases bargaining power for these groups of states, and increases the likelihood that they will acquire the resources they need (Beran, 2011).

Given this information, it is clear that solutions to insulin inaccessibility are possible and are actively being worked on across the world. Yet, the imminent threat of insulin inaccessibility continues to affect millions, constituting a repetitive violation of international human rights law. The inability to afford insulin, as aforementioned, has led to deprivation of basic necessities for diabetics and their families. Diminished access to food, electricity, and proper housing, resulting from the hefty costs of insulin, is a reality for many. Severe, life-threatening ketoacidosis is also a disturbingly common threat. None of these realities constitute fufillment essential rights outlined in international covenants.

Solutions become even trickier when intellectual property law enters the picture, as seen in the Sanofi lawsuit mentioned above. In the very same covenant which upholds both the rights to the highest attainable standard of health and the right to scientific progress, the right "to benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author" is also proposed (International Covenant, 1966). The right to scientific progress is essentially in conflict with itself, and difficult to reconcile. If patents are preventing life-saving innovations and generic brands from flourishing and being distributed unto society, then which right is prioritized? How can societies solve pressing medical issues, and combat pharmaceutical monopolization, without encroaching upon intellectual property rights and legal protections? When two internationally recognized rights are in conflict, which takes precedence?

Although outside the scope of this paper, there is a need to critically investigate the relationships between international intellectual property law and HIV/AIDS medications in order to find useful parallels that could potentially be applied to the case of insulin. HIV/AIDS innovations have had their own battles with patent laws, which could provide insight as to how to navigate the legality surrounding insulin regulations and intellectual property rights.

When discussing the global insulin crisis, a wide range of issues must be considered: the way global regions are viewed and framed in discussions of innovation; methods to ensure that the means of innovation are not only diverse, but ethical; and means of creating equality between accessibility and intellectual property, to name a few. Additionally, one must continue to ask how state limitations, global power dynamics, and economic systems influence access to knowledge in pharmaceuticals, distribution of supplies, and innovation, in their entirety. Additional research into the way these questions intersect with broader human rights

concerns could highlight exploitative structures and suggest new avenues to address the root causes of inequality in access to healthcare.

It is clear that the sphere of medical treatment accessibility, and of insulin treatments accessibility in particular, is an intricate, layered world to navigate. Until priorities are reorganized and aligned, proper measures cannot take place to combat insulin inaccessibility. The global insulin crisis is encroaching upon all of us, and manifesting in differently sinister ways. State-specific solutions, which still manage to maintain intellectual property rights, as well as regulate the quality of medications, are needed. Ultimately, the world is faced with a balancing act between the various elements that go into treating and regulating diabetes. However, in light of growing violations of the right to health related to insulin inaccessibility, there is an ultimate legal obligation to put people ahead of profits by prioritizing insulin treatment access.

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