

**An Actor Network Theory Approach to Hepatitis C Treatment Access in 2013**

STS Research Paper  
Presented to the Faculty of the  
School of Engineering and Applied Science  
University of Virginia

By

Caroline Doyle

April 15, 2022

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: Caroline Doyle Date: April 15, 2022  
Caroline Doyle

Approved: \_\_\_\_\_ Date: \_\_\_\_\_  
Benjamin J. Laugelli, Assistant Professor, Department of Engineering and Society

## Introduction

According to estimates by the World Health Organization, over 58 million people worldwide are living with Hepatitis C, a viral infection that causes liver inflammation and the potential for liver damage (*Global Viral Hepatitis*, 2021). That was the case for Louisiana resident, Lisa Gray, who acquired Hepatitis C in 1991 and was still living with it 25 years later. She spent most of her life living with the symptoms of the disease and waiting for a safe and effective treatment option to become available to her. Gray attempted one treatment in the 1990s but decided to discontinue it once she learned of the frightening symptoms and had confirmed she was pregnant. In 2013, a new treatment option with significantly better patient outcomes came onto the market. However, Gray was not a candidate for the treatment for several years due to the Louisiana Medicare restriction that prioritized the sickest patients, usually those with liver cirrhosis, first. Once her liver damage reached the point that she would qualify for the treatment, she had the startling realization that it would not be covered by Medicare because she was also receiving medical disability checks from the state (*Hepatitis C Patients Are Being Forced Into Underground Buyers' Clubs*, 2018).

Sick and without the means to cover the treatment on her own or afford private healthcare, Lisa reached out to Greg Jeffreys. Jeffreys is one of many people that runs an international “buyers’ club” for Hepatitis C medications. The buyers’ clubs operate by taking advantage of personal importation laws. In the US, that means that an individual can import less than a three-month supply of the medication as long as they do not sell or distribute it. These organizations operate within a gray area with regards to legality. Purchasing medication from international buyers’ clubs allows recipients to get the treatment for a significantly reduced price, but they take a risk on the safety of the drugs because they are not regulated by the Food and

Drug Administration (FDA). In Lisa's case, she was able to receive an expired drug from India free of charge and her second medication for \$350, which is roughly \$80,000 less than treatment in the US would have cost without insurance. Lisa's doctor strongly recommended against her taking the unregulated medication, insisting it would likely harm her. Luckily for Lisa, instead of being harmed by the treatment with international origins, she was cured by it (*Hepatitis C Patients Are Being Forced Into Underground Buyers' Clubs*, 2018).

Within the case study of Lisa Gray's battle with Hepatitis C, there are many forces at play. Each of these components, or actors, has a role in the overall Hepatitis C treatment network. Without evaluating each of the actors and their contribution to the system, it is difficult to understand why Lisa Gray, and others like her, had so much trouble receiving treatment for their Hepatitis C infection within the US. As a consequence, without this deeper level of analysis, engineers and public health professionals will be unable to develop suitable treatments that are both effective and accessible to the target patient population.

Through the case of Lisa Gray and patients similar to her battling Hepatitis C, I will use Actor Network Theory (ANT) to argue that the company Gilead, rather than healthcare companies, patients, buyers' clubs, or the drug itself, is the dominant actor that ultimately controlled patients' access to the curative treatment. I will begin by summarizing relevant background information from my literature review. Then, I will explain the basic principles of the Actor Network Theory. Next, I will outline which actors I consider the most relevant to analyze within the network surrounding this case study. Lastly, I will show how I reached my conclusion that Gilead is the dominant actor within the network, largely because the price set by the company controlled how all the other actors functioned and their associated connections.

## Background

Hepatitis C is a viral infection that causes liver inflammation, sometimes leading to serious liver damage (*Hepatitis C*, n.d.-a). The virus spreads through blood contamination and symptoms can take decades to appear, resulting in about half of people with Hepatitis C to not know they are infected. People generally realize they have the condition once the virus has damaged the liver enough to cause signs and symptoms of liver disease, like jaundice (the yellow discoloration of the eyes and skin), abdominal pain and swelling, dark urine color, and chronic fatigue (*Hepatitis C - Symptoms and Causes*, n.d.). Although there are a variety of factors that increase a person's risk of contracting Hepatitis C, such as being part of the Baby Boomer generation and receiving a blood transfusion prior to 1992, it is stigmatized for its association with intravenous illicit drug use (Marinho & Barreira, 2013).

Prior to 2013, the best method of treatment was a combination of pegylated interferon- $\alpha$ , administered once weekly, plus daily oral ribavirin for 24 to 48 weeks. In patients with Hepatitis C genotypes 2 and 3, this therapy led to the absence of Hepatitis C in a patient 6 months after treatment in 80-90% of patients treated. However, it was only successful in 50% of patients with genotypes 1 and 4 and came with numerous side effects (Rong & Perelson, 2010). In 2013, the drug Sovaldi was released by the company Gilead and approved by the FDA as an oral therapy taken as a tablet in combination with other drugs (depending on virus genotype). It was the first drug to be taken without an interferon component and was immediately more effective. However, it came with a massive price tag. Gilead's Sovaldi came to the market at a cost of \$1,000 per pill, which translates to \$84,000 for a 12-week treatment cycle that cures most patients (*Hepatitis C*, n.d.-b).

State Medicaid budgets are simply not large enough to cover treatment for everyone with Hepatitis C due to the price of Sovaldi. Most state Medicaid programs have dealt with this shortfall by limiting treatment to people who meet their predetermined criteria. In the state of Louisiana, this meant a liver damage requirement that ensured those in the worst condition got treated first. Additionally, Louisiana Medicaid programs also implemented a sobriety restriction that required all eligible patients to be substance-free for 12 months prior to treatment approval, even though most new Hepatitis C infections in the US are the result of drug use (“Hepatitis C,” n.d.-c). These requirements made it nearly impossible for large populations of Hepatitis C patients, including those without serious liver damage that used illicit drugs and were too poor for private healthcare, to have access to the curative treatment.

### **Literature Review**

There is a considerable amount of scholarly research concerning the impact of the drug Sovaldi. However, aside from technical research on its effectiveness, almost all the scholarly information focuses on the drug in relation to healthcare providers, specifically Medicare, Medicaid, and the Department of Veterans Affairs. One paper written months after the drug was approved by the FDA explored the role of Medicare in treating Hepatitis C (*The Cost Of A Cure: Medicare’s Role In Treating Hepatitis C | Health Affairs*, n.d.). The authors explained that due to Hepatitis C being most prevalent among Baby Boomers, the number of patients seeking Hepatitis C treatment through Medicare will continue to increase as more members of the generation become eligible for Medicare benefits. The paper then goes into the logistics surrounding how the Medicare budget will be able to handle treating the aging population with Hepatitis C.

Likewise, a different paper analyzed the Medicaid response to the new drug for each state (Canary et al., 2015). Medicaid covers approximately one quarter of patients that are hospitalized for Hepatitis C, making its policies incredibly relevant for patients with the virus. The paper provided details regarding the restrictions each state had put in place to determine who would receive money from the state for treatment. This is valuable information because it shows how policies vary state to state. The researchers found that Medicaid programs in 31 states designated the Sovaldi drug as the “nonpreferred” form of treatment, requiring clinicians to provide evidence for its medical necessity for patients, even though clinical trials had already shown the drug was more effective than other treatment options. Additionally, most state programs required that patients be scored on their level of liver fibrosis and in 33 states, only those with a score associated with severe liver disease were authorized for Sovaldi treatment. 35 states require that patients abstain from alcohol use and thirty states require abstinence from illicit drug use for various amounts of time prior to treatment. These papers are useful for their analysis on the response from federal and state healthcare. However, they seem to only analyze how restrictions by insurance companies will limit the patients’ access to the curative treatment. While true, this perspective does not address the root cause of why Medicare and Medicaid need to restrict coverage of the drug. They do not consider Gilead an actor within the network and only explore how insurance reacts to the release of the company’s drug.

Another piece of scholarly work made a completely different argument concerning the introduction of the new drug and the stress it put on insurance companies to provide coverage for their patients with Hepatitis C. This paper argued that capitalism was the major reason for large drug companies that had become very wealthy off the sale of medications. It also pointed toward the minimal regulation on most pharmaceutical companies which allowed them to sell their

drugs for whatever price they deemed acceptable. This is a valuable perspective because it recognizes that there are numerous actors at play within the Sovaldi access network and Lisa Gray case study in particular. However, seems to make excuses for pharmaceutical companies by insisting that they are only trying to make a profit by whatever means necessary and acceptable within legal bounds. By doing this, the author removes all responsibility from the companies themselves (*Pharmaceutical Capitalism and Its Logistics: Access to Hepatitis C Treatment - Mathieu Quet, 2018, n.d.*). My analysis of the overall treatment network will utilize a framework to provide additional analysis on the topic where this scholarly literature has fallen short.

### **Conceptual Framework**

The science, technology, and society framework of Actor Network Theory (ANT) is useful to apply to this topic because it provides a means of analyzing the heterogeneous components and connections within this system. Once each part of the system is characterized, it can be fully examined and critiqued. This will bring about a better understanding of the system in its entirety and help answer the question of how specific technologies come about.

There are numerous forms of the ANT framework, each with its own nuances. This paper will primarily draw from the ANT ideas composed by French sociologist, Michel Callon. At its core, ANT deconstructs a network by tracing the complex relationships that exist between its various components. It is unique in the idea that it considers both human and non-human components equally as actors within a network. Each component can be considered an actor and a network based on the perspective that is used. The framework studies the associations between heterogeneous actors in order to map the ways in which the actors define and distribute roles and

mobilize others to play those roles. It argues that everything (technologies, people, social order, etc.) is the result of heterogeneous networks (Cressman, 2009).

One distinct concept of the ANT framework is that the degree of influence of an actor is not static within the network. The power of the actors within a network is based on the associations that the actors have with each other. The strength of these associations creates power within the network and this power fluctuates as the associations change.

Callon uses the concept of translation to track the development of a network. Translation is the process by which elements are related in a sociotechnical network. It can be generalized as the movement of technological development over time. Bruno Latour interpreted translation through the concept of delegation where the social and the technical aspects of a network have a reciprocal relationship (Cressman, 2009).

The process of translation is divided into four phases: problematization, interessement, enrolment, and mobilization. In problematization, the primary actor defines the problem, identifies actors that need to be recruited, and defines the obligatory passage points which denotes the points that the other actors must pass to form a stable connection within the network. Next, in interessement the primary actor actively recruits the actors identified in the previous step. In the enrolment phase, the primary actor assigns roles to the recruited actors within the network and they carry them out as intended. Lastly, in the mobilization phase, the primary actor assumes its role as the director for the actor network once it begins to function together. The entire network relies on each of the actors playing the role that was assigned to it in order for the network to function successfully (Callon, 1984).

Within this paper, I will use the ANT framework to analyze each of the actors within the Hepatitis C drug network after the release of the curative Sovaldi drug. This will enable me to



understand the complex relationships between the actors and track the points of dysfunction within the network that arose from various actors not playing their intended roles. This will help me determine why the overall actor network did not function as successfully as possible.

## **Analysis**

### *Network Formation*

Reconstruction of the Hepatitis C and Sovaldi actor network will provide the necessary framework for a critical analysis on the overall network. The first step in reconstructing the network is to define all the prominent actors. I have identified the most important human and organizational actors as the patient that has Hepatitis C, the doctors that seek to treat the patient's condition, the pharmaceutical company Gilead that sells the drug, the healthcare companies that provide insurance patients, the buyers' clubs that sell generic medication, and the scientists and engineers that design the treatment. Similarly, I have defined the sole non-human as the drug Sovaldi itself which cures Hepatitis C.

Determining how the actors are associated within the network will provide valuable information regarding the internal power structures. I will make these associations by tracking the network's formation through the phases of translation laid out by Callon and described above. Based on their role being the reason for the presence of all the other actors, I assume here that the patient is the primary actor that the entire Hepatitis C and Sovaldi network formed around through the translation process.

The first phase of the translation process is problematization. This is where the primary actor defines the problem and identifies the actors that need to be recruited. In this case, the patient recognizes that they are ill and decides that they need to consult a clinician to diagnose

their ailment. Based on this problem definition, the clinicians determine that the patient needs a new treatment that will be developed through a pharmaceutical company by scientists and engineers. Additionally, the clinicians recognize that the patient will need a third party payer, like a health insurance program, to make the treatment affordable for the patient. Together, the patient and clinician are able to lay out the network by connecting the other actors around the patient at the obligatory passage point.

During intersement, the patient is able to recruit all the necessary actors. First, the patient seeks help from the clinician. Once the clinician determines they are unable to treat the patient with the medicine already available, they look to recruit the pharmaceutical company. The company, Gilead in this case study, then recruits its scientists and engineers to develop a new drug that will serve the purpose of curing the specific population similar to the original patient. The patient also recruits a healthcare company so they are covered when the treatment is available to them.

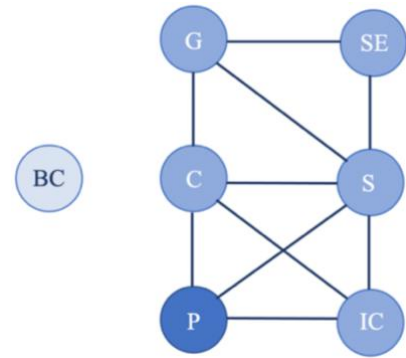
In the optimal enrolment scenario, each of the recruited actors (the clinician, drug company, scientists and engineers, and healthcare company) will all accept their designated roles and form mutual connections as intended by the patient. In this hypothetical scenario, the scientists and engineers successfully research and produce a medication that is ideal for the patient's condition. The drug actor, Sovaldi, is able to pass through obligatory passage point indirectly due to it not being directly associated with the patient until the other actors are in place to make it accessible. Once the drug is successful in its clinical trials and approved by all necessary regulation groups, the healthcare company provides funding to the patient so they can receive the treatment. Under these conditions, the patient has the opportunity to select and

receive the ideal treatment for themselves that gives them the best chance at curing their ailment. Finally, the patient will solidify all the connections between themselves and the other actors, allowing for effective communication, resulting in maximized quality of life for the patient.

It is important to note that the buyers' club actor is not present in this actor network, displayed in Figure 1. That is because the buyers' club is not necessary in an ideal hypothetical situation where the healthcare company can afford to treat the patient and not restrict their access to medication. The buyers' club only enters actor network once it stops functioning as intended and the patient is left unable to access treatment without the assistance of a third party.

### *Profit Maximization*

Before I deconstruct and analyze the previous actor network, it is necessary to consider the underlying motivations of Gilead in relation to the treatments they create and market. In short, it is advantageous for a pharmaceutical company with a highly effective drug to try to make the largest profit possible off their creation. Although there is no publicly available information that outlines the total cost Gilead paid in the research and development (R&D) phases for Sovaldi, it can be assumed to be very expensive. Gilead stated in their own press release, following initial backlash about the price of their drug, that the company does not track the R&D costs of individual therapeutics (*SEC Filing | Gilead Sciences, n.d.*). The Tufts Center for the Study of Drug Development ran a study that evaluated the R&D costs of 106 randomly selected new drugs from 10 pharmaceutical companies that were approved from 1995 to 2007. They calculated that the average development cost of a new drug was about \$2.87 billion in 2013



**Figure 1. Diagram of the ideal actor network.** P is the patient, IC is insurance company, C is clinician, S is Sovaldi, G is Gilead, SE is scientists and engineers, and BC is the buyers' club. The lines indicate a mutual relationship between the various actors.

dollars (DiMasi et al., 2016). Other institutions have estimated the total cost of developing a drug to be closer to \$5 billion before it reaches American consumers (Busse & Garthwaite, n.d.). This is clearly no small undertaking, and it is likely a major reason Gilead wanted to make a major profit on the drug.

Following the release of Sovaldi with its exorbitant price (quickly followed by the release of Harvoni by Gilead priced at \$94,500), the U.S. Senate Finance Committee entered into an 18-month investigation into the pricing and marketing of Gilead's two Hepatitis C treatments. The investigation analyzed internal company documents, interviews from healthcare experts, and data from Medicaid programs. Based on their findings, it is clear that Gilead systematically priced and marketed the drug for the sole purpose of revenue maximization. There is no evidence that financial matters, such as R&D costs factored into the price selection. Additionally, evidence shows that Gilead knew the exorbitant prices would put the treatment out of reach for millions of Americans with Hepatitis C and cause funding issues for Medicaid and Medicare, but chose to go ahead with the pricing (*Wyden-Grassley Sovaldi Investigation Finds Revenue-Driven Pricing Strategy Behind \$84,000 Hepatitis Drug / The United States Senate Committee on Finance*, n.d.).

This is not the only perspective on the topic. Many scholars considered the lifesaving abilities of this new medication and its advantages over previous interferon-based treatment to be worth the price. John Castellani, President and CEO of Pharmaceutical Research and Manufacturers of America, considers the benefits of the new drug to outweigh its costs:

It is penny-wise and pound-foolish to focus solely on the price of a new medicine while completely ignoring the value it provides to patients and the health care system broadly. Curing hepatitis C not only dramatically improves patients' lives but has the potential to save the U.S. health care system as much as \$9 billion per year by preventing expensive

hospitalizations and avoiding thousands of liver transplants that routinely cost over \$500,000 each. (Barlas, 2014).

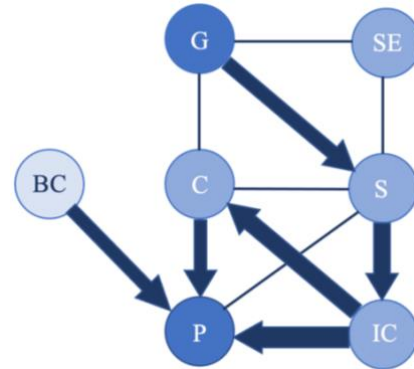
Castellani's argument is factually correct. Curing Hepatitis C does have the potential to save the healthcare system large sums of money. However, that is only possible if health insurance companies can afford to cover the treatment for patients. Instead, by the time most patients were qualified to receive the treatment, they were already receiving extensive and costly hospital care due to the requirement for liver damage by most insurance policies. Additionally, Castellani's argument does not address the reason that Gilead chose to commercialize the medication at such a high price point. In 2014 alone, sales of Sovaldi raked in \$10.3 billion, making it the second best-selling drug in the world (Lazonick et al., 2017). At a price of \$84,000 per 12 week treatment course when the manufacturing cost of the drug is estimated at under \$250, it would be difficult not to make a major profit (Hill et al., 2014).

### *Imbalance of Power*

In the network construction section above, I outlined the steps involved in the translation process in an optimal situation. However, that is not the case within this actor network, as shown in the updated actor network diagram in Figure 2. In reality, the patient actor was able to recruit clinicians which advocated to the pharmaceutical company, Gilead, for a new and improved treatment of Hepatitis C. Gilead then recruited the scientists and engineers who were able to successfully develop the product. However, the connection between the new drug and the healthcare companies and clinicians is not ideal because of the price of the drug. This pricing then caused healthcare companies to limit how clinicians prescribed the drug to certain patients due to selection criteria that were instituted to ensure the healthcare companies were able to

maintain their budget. Obviously, this prevented most patients from accessing the curative treatment. Instead, a new actor was recruited, the buyers' clubs, which bypassed clinicians and healthcare companies to directly provide the patient with an affordable, although less safe, means of treatment.

It is clear within this context that although the healthcare companies did directly impact and reduce the accessibility of the drug for patients with Hepatitis C through extensive restrictions like liver damage requirements and abstinence from illicit drug use, this was a result of Gilead pricing the drug at a value that was simply not affordable. This was the first action that began to shift the power relations among the actors within the heterogeneous actor network.



**Figure 2. Diagram of the actor network in practice.** P is the patient, IC is insurance company, C is clinician, S is Sovaldi, G is Gilead, SE is scientists and engineers, and BC is the buyers' club. The arrows show the influence different actors obtained due to the power imbalance resulting from Gilead's pricing of Sovaldi. The connections without arrows remain the same as in the ideal scenario. For example, the IC policies were controlled by the price of Sovaldi which then impacted how clinicians prescribed the drug to patients.

### Conclusion

In this paper, I have made use of the sociotechnical framework of Actor Network Theory to systematically construct and deconstruct the Hepatitis C and Sovaldi actor network to determine why the system was not functioning as intended, with patients able to access curative treatment options. Through an analysis of the cost breakdown of developing a new drug and the profit margin Gilead had, it is evident that patients were not able to receive Sovaldi as a direct result of profit maximization practices that caused the company to market the product for an exorbitant price. With this information, analysis of the steps of translation and the power

relations through association with the actor network make it evident that Gilead's actions, which focused on profit maximization, shifted the balance of the entire actor network.

Going back to the case study of Lisa Gray, it is evident that although the direct reason she was unable to receive treatment and was forced to purchase expired medication from Buyers' Clubs was due to Medicaid policies, it was indirectly a result of the Gilead marketing team pricing the medication at a point that was not affordable for the Louisiana state Medicaid program. This information is valuable for the other actors in the network that performed their roles as intended by the primary actor, the patient. It may be useful for the other actors to adapt their behaviors to account for the profit maximization tendencies of common to pharmaceutical companies.

Word count: 3883

## References:

- Barlas, S. (2014). Are specialty drug prices destroying insurers and hurting consumers? *Pharmacy and Therapeutics*, 39(8), 563–566.
- Busse, M., & Garthwaite, C. (n.d.). Sovaldi: Pricing a breakthrough drug. 10.
- Callon, M. (1984). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St Brieuc Bay. *The Sociological Review*, 32(1\_suppl), 196–233.  
<https://doi.org/10.1111/j.1467-954X.1984.tb00113.x>
- Canary, L. A., Klevens, R. M., & Holmberg, S. D. (2015). Limited access to new Hepatitis C virus treatment under state Medicaid programs. *Annals of Internal Medicine*, 163(3), 226–228. <https://doi.org/10.7326/M15-0320>
- Cressman, D. (2009). A brief overview of actor-network theory: Punctualization, heterogeneous engineering & translation. <https://summit.sfu.ca/item/13593>
- DiMasi, J. A., Grabowski, H. G., & Hansen, R. W. (2016). Innovation in the pharmaceutical industry: New estimates of R&D costs. *Journal of Health Economics*, 47, 20–33.  
<https://doi.org/10.1016/j.jhealeco.2016.01.012>
- Global viral Hepatitis: Millions of people are affected / CDC. (2021, July 19).  
<https://www.cdc.gov/hepatitis/global/index.htm>
- Hepatitis C. (n.d.-a). Retrieved October 24, 2021, from <https://www.who.int/news-room/factsheets/detail/hepatitis-c>
- Hepatitis C - Symptoms and causes. (n.d.). Mayo Clinic. Retrieved October 24, 2021, from <https://www.mayoclinic.org/diseases-conditions/hepatitis-c/symptoms-causes/syc-20354278>



Hepatitis C: New treatments emerge in 2014 that will have profound implications for payers.

(n.d.-b). AJMC. Retrieved October 24, 2021, from <https://www.ajmc.com/view/-hepatitis-c-new-treatments-emerge-in-2014-that-will-have-profound-implications-for-payers>

Hepatitis C patients are being forced into underground buyers' clubs. (2018, October 2). Talk Poverty. <https://talkpoverty.org/2018/10/02/hepatitis-c-patients-forced-underground-buyers-clubs/>

Hepatitis C: The state of Medicaid access 2017 National Summary Report. (n.d.-c). Center For Health Law and Policy Innovation. Retrieved October 31, 2021, from [https://www.chlpi.org/health\\_library/hepatitis-c-state-medicaid-access-2017-national-summary-report/](https://www.chlpi.org/health_library/hepatitis-c-state-medicaid-access-2017-national-summary-report/)

Hill, A., Khoo, S., Fortunak, J., Simmons, B., & Ford, N. (2014). Minimum costs for producing hepatitis C direct-acting antivirals for use in large-scale treatment access programs in developing countries. *Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America*, 58(7), 928–936. <https://doi.org/10.1093/cid/ciu012>

Lazonick, W., Hopkins, M., Jacobson, K., Sakinç, M. E., & Tulum, Ö. (2017). US Pharma's financialized business model (SSRN Scholarly Paper ID 3035529). Social Science Research Network. <https://doi.org/10.2139/ssrn.3035529>

Marinho, R. T., & Barreira, D. P. (2013). Hepatitis C, stigma and cure. *World Journal of Gastroenterology : WJG*, 19(40), 6703–6709. <https://doi.org/10.3748/wjg.v19.i40.6703>

Pharmaceutical capitalism and its logistics: Access to Hepatitis C treatment—Mathieu Quet, 2018. (n.d.). Retrieved February 27, 2022, from

<https://journals.sagepub.com/doi/full/10.1177/0263276417727058>

Rong, L., & Perelson, A. S. (2010). Treatment of Hepatitis C virus infection with interferon and small molecule direct antivirals: Viral kinetics and modeling. *Critical Reviews in Immunology*, 30(2), 131–148.

SEC filing / Gilead Sciences. (n.d.). Retrieved February 28, 2022, from

<https://investors.gilead.com/node/38946/html>

The cost of a cure: Medicare’s role in treating Hepatitis C | Health Affairs. (n.d.). Retrieved February 27, 2022, from

<https://www.healthaffairs.org/doi/10.1377/forefront.20140605.039396/full/>

Wyden-Grassley Sovaldi investigation finds revenue-driven pricing strategy behind \$84,000

Hepatitis drug | The United States Senate Committee on Finance. (n.d.). Retrieved March 1, 2022, from <https://www.finance.senate.gov/ranking-members-news/wyden-grassley-sovaldi-investigation-finds-revenue-driven-pricing-strategy-behind-84-000-hepatitis-drug>