Testimony for the Record

Submitted to the U.S. Congress

House Committee on Ways and Means

For Hearings on Examining Chronic Drug Shortages in the United States

February 6, 2024

Jeromie Ballreich, Ph.D., M.H.S.

Associate Research Professor

Johns Hopkins University

Chairman Smith, Ranking Member Neal, and Honorable Members of the U.S. House Ways and Means Committee, thank you for the opportunity to testify about chronic drug shortages. I am Jeromie Ballreich, and I am an Associate Research Professor in the Department of Health Policy and Management at the Johns Hopkins Bloomberg School of Public Health. I direct the master's program in health economics. I am a core faculty member of the Johns Hopkins Drug Access and Affordability Initiative, which is a research center evaluating US drug shortages and incentives for drug innovation. My research focuses on the US pharmaceutical market, pharmacoeconomics, and economic evaluation. The views expressed within my testimony do not necessarily represent the views of Johns Hopkins University.

As a researcher in this field, I recognize the health problem of chronic drug shortages and have studied the complex array of factors that contribute to drug shortages. My objective for this testimony is to provide an overview and rationale for actions the Congress can take to reduce the number of chronic drug shortages.

I recommend Congress consider four policy solution sets addressing chronic drug shortages:

- **Improve transparency of drug supply chains**
- **Address generic market resilience through demand-oriented policies.**
- **Increase supply chain resilience through supply-oriented policies.**
- **Ensure continued patient access via the establishment of a supply safety net.**

Improving the transparency of the drug supply chain will allow for the identification of supply chain vulnerabilities for key stakeholders of the US drug market. Demand-oriented solutions will encourage long-term market commitment of generic manufacturers and incentivize investment for supply chain resilience through the use of financial incentives directed towards the generic market. Supply-oriented policies include financial incentives for US drug and active ingredient manufacturing. Providing a safety net for US patients could be done by establishing supply buffers or stockpiles to mitigate the impact of any sudden changes to the drug supply chain.

Causes of drug shortages

Drug shortages are a serious public health problem affecting providers, payors, and most importantly, patients. It is essential that patients have immediate access to quality medicines to treat their diseases and conditions. Disruptions to access can interrupt plans of care, cause additional financial costs, and put patients' lives at jeopardy. According to a 2023 report commissioned by the Office of the Assistant Secretary for Planning and Evaluation, the average drug shortage affects nearly half a million patients, many of which are over the age of 65.[i] Not only does a single drug shortage affect a significant patient population, but the number of drug shortages occurring annually are in the hundreds. The University of Utah Drug Information Service, which tracks real-time drug shortages, identified, and tracked over 300 shortages in 2023-the highest annual level in the past decade.[ii]

The problem of drug shortages is not a new public health problem. In 2012, Congress passed the Preserving Access to Life-Saving Medications Act, which improved shortage notification and provided the US Food and Drug Administration (FDA) additional authority to address shortages. This law improves the transparency of the drug supply chain and addressed some of the causes of shortages; however, drug shortages continue to be a major public health problem. The stubbornness of this problem is a testament to the complexity of the US drug market and the root causes of drug shortages.

The reasons behind drug shortages can broadly be categorized into supply chain factors and quality issues. On the supply chain side, shortages occur when there is a disruption in manufacturing due to changes in financial circumstance, geopolitical events, or natural disasters. For example, in 2017, Hurricane Maria devastated Puerto Rico and the pharmaceutical industry located there. This significantly disrupted the supply chain for hundreds of drugs since many drugs are manufactured in only one location. This natural disaster and supply chain disruption resulted in shortages of crucial medicines, such as the injectable antibiotic, azithromycin.[iii] **However, according to FDA data, these external factors are responsible for only a small portion of the drug shortages. Most of the shortages are caused by the actions of the manufacturers**.[iv]

Most commonly drug shortages occur due to problems with manufacturing and quality concerns. The manufacturing of drugs is a complex process involving chemical or biological processes which need to occur in sterile environments. If these processes are not kept to the highest standard of quality, the drugs can become contaminated, and patients' safety is compromised.

Quality issues cause shortages across a variety of different drugs, including both branded and generic drugs. Quality issues were the primary cause of shortages for many important life-saving cancer medications. In 2023, the drug manufacturer Intas was a major supplier of cisplatin, an important chemotherapy drug. The company relied on one manufacturing plant in India to produce these drugs. A series of FDA inspections raised several red flags for the safety and quality of the manufacturing, ultimately leading to a shutdown of the plant in India which caused nearly immediate shortages of cisplatin. The quality issues were so numerous and severe that the FDA called it a "cascade of failure" for the quality and safety of manufacturing and required significant time and investment to remediate.[v]

The generic drug industry is responsible for nearly 90% of prescriptions dispensed.[vi] Unlike branded drugs, which have patent protection and can charge high prices for the drugs, the generic industry relies on competition to keep prices low. However, this reliance on competition can result in drug shortages. There is nothing to differentiate one generic drug from another since they all must replicate the active ingredients of the branded drug to get FDA approval. As a result, generic companies compete solely on price and competitive forces maintain constant downward pricing pressure. Hospitals, clinicians, wholesalers, and pharmacies are incentivized to procure generic drugs at the cheapest possible prices. The low prices and thin profit margins can result in generic companies exiting the market potentially causing a drug shortage and generally reducing overall supply capacity. A recent study showed that over half of generic manufacturers exit the market within four years of entering the market.[vii] The current market rewards companies who offer the lowest price but offers no rewards for long-term market commitment, improving supply chain resilience, or maintaining high quality manufacturing standards.

Changes in the demand for certain drugs and a reliance on just in time manufacturing, slim inventories, and other supply chain efficiencies exacerbate drug shortages especially if there is a limited supply capacity to respond to changes in the demand of a drug. There were shortages for drugs treating conditions such as attention deficit hyperactivity disorder caused in part due to increased demand because of proliferation of mental health telehealth providers and increased prescribing of stimulants.[viii] We have also seen shortages for the diabetic and weight loss medications due to sharp changes of demand for weight loss.

Proposed Policy Solutions

Improved Transparency

Legislation should be enacted to require that drug manufacturers disclose information on key attributes of the drug supply chain including site and capacity of drug manufacturing facilities and the source of the raw materials used to manufacture the drugs. **According to a 2023 study by my Johns Hopkins colleagues, two countries India and China – provide the greatest percentage of raw materials used in the manufacture of drugs sold in the US**.[ix] When there is a pandemic or geopolitical strife there can easily be a disruption to the supply chain. The US needs to develop its own supply of the components necessary to manufacture the drugs sold in the US. We should not be relying solely on other countries for the raw materials used to manufacture the drugs treating US patients.

The supply chain behind each patient's drug can be complex and opaque. The lack of transparency precludes key stakeholders from identifying vulnerabilities and possible solutions. The supply chain threat due to lack of transparency can be illustrated by an example that often occurs. Suppose there are 10 generic manufacturers for a single drug. At first glance, stakeholders could assume the supply chain has good resilience, since multiple manufactures can cover any supply disruptions. But that assumption breaks down if all 10 manufacturers source their raw materials from a single producer. Even if these manufacturers source from two or three

different producers, the assumption of good supply chain resilience could still breakdown if the producers of APIs are in the same country.

Demand-oriented policies

Changes in how generic drugs are paid could incorporate incentives for manufacturers to invest in more resilient supply chains. These policies could include higher payment levels for manufacturers who demonstrate a commitment for resilient supply chains and higher payment levels for generic drugs with complex manufacturing in small markets.

The generic market rewards manufacturers who offer the lowest price. The current payment system does not take into account long-term market commitments by manufacturers, nor does it incentivize manufactures to invest in more resilient supply chains. One mechanism for incorporating incentives for manufacturers to invest in the supply chain could be payment which incorporates a grading system based on supply chain resiliency where payers, notably Medicare and Medicaid, pay for generics at a higher price if they score high on the grading system. The Medicare program does this for hospitals and Medicare Advantage plans that score well on certain measures.[x]

In recent years, a major drug shortage occurred for generic sterile injectables (GSIs). Researchers attributed this shortage to the small market size for these injectables, price competition, and complex manufacturing, which limited market entrants. The causes for GSI shortages are similar for the generic market in general, except GSI's tend to require higher manufacturing investment due to the complex manufacturing process. Reimbursement is also typically through hospital or outpatient payments, which often bundle drug payments with other services. CMS should consider ways to incorporate quality payments to improve supply chain resilience for GSI's and incentivize manufacturer to invest in resilience. Several researchers have identified specific mechanisms to address GSI's.[xi]

I am concerned with the incentives created by the Inflation Reduction Act's (IRA) penalties for price increases. My concern is not that there are provisions to limit price increases to the rate of inflation, but the fact that drugs in shortage can be exempt from the penalties if they increase

prices faster than inflation. Drug companies signal to the FDA that they believe their drug is in shortage and typically the FDA places that drug on a shortage list. This is appropriate since hospital and clinicians want to know they could be a shortage of a specific drug. However, the Inflation Reduction Act exempts drugs with a shortage designation from price increase penalties. This exemption may incentivize drug manufacturers to self-identify shortages. This policy could be improved by limiting the exemption to shortages which are not caused by changes in demand. CMS needs to take a careful look at the drugs in shortage to determine the reason for the shortage.

Supply-oriented policies

Policies should be enacted to incentivize domestic drug and ingredient manufacturing and encourage supply chain resilience.

In 2019, 87% of facilities producing the raw materials used to manufacture the drugs and 60% of facilities producing finished generic drugs were outside of the US.[xii] The large concentration of API production in China and India leaves our drug supply chain vulnerable to geopolitical risks. The best way to mitigate these risks is to diversify manufacturing to other countries and given the impact on patients due to drug shortages, policies should prioritize a move to strengthen domestic drug and ingredient manufacturing. These policies could come in the form of subsidized loans, tax incentives, or even higher payment rates for drugs produced in the US or have a US based supply chain.

Supply safety net

Policies should be enacted to create a supply safety net in the form of either a stockpile of essential drugs or the raw materials used to manufacture the drugs; or incentivize the purchase of buffer stocks by hospital or wholesalers.

As noted earlier, there exists several causes of drug shortages in the US. Policies have been proposed to increase supply chain resilience, with the intent of mitigating future drug shortages. Given that patients depend on these drugs, Congress should also consider creating a national stockpile of essential drugs or raw materials in case of any significant sudden disruption to the

supply chain. Congress could also opt for a more decentralized approach by providing financial incentives to wholesalers or hospitals to increase their inventory of essential drugs beyond short-term demand needs. CMS as recently proposed a rule to encourage buffer stocks at hospitals, but this rule could be broadened to other intermediary suppliers, such as wholesalers. These financial incentives could be in the form of grants or tax incentives to increase inventory levels.

There are benefits to a national stockpile including coordination of supply and economy of scale. A national stockpile will provide a centralized accounting of available drugs and can be accessed in times of shortages. In addition, having a single purchaser in charge of a national stockpile will improve the economy of scale and lower operating costs.

Conclusion

Congress needs to consider policies to improve the supply of drugs and improve supply chain resilience. **Immediate priorities should be decoration of a national stockpile of essential medicines, greater transparency of the supply, chain, and reform generic drug reimbursement to incentivize supply chain investment.**

---

[i] Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health & Human Services. Impact of Drug Shortages on Consumer Costs. May 2023. https://aspe.hhs.gov/

[ii] https://www.ashp.org/-/media/assets/drug-shortages/docs/ASHP-2023-Drug-Shortages-Survey-Report.pdf

[iii] https://www.nytimes.com/2017/10/23/health/puerto-rico-hurricane-maria-drug-shortage.html

[iv] https://www.fda.gov/drugs/drug-shortages/report-drug-shortages-root-causes-and-potential-solutions

[v] https://www.nytimes.com/2023/12/19/health/cancer-drug-shortage.html?bgrp=c&smid=url-share

[vi] Food and Drug Administration. Office of Generic Drugs 2021 annual report [Internet]. Silver Spring (MD): FDA; 2022 Feb 14. Available from: https://www.fda.gov/drugs/generic-drugs/office-generic-drugs-2021-annual-report

[vii] Frank RG, McGuire TG, Nason I. The evolution of supply and demand in markets forgeneric drugs. *Milbank Q*. 2021;99(3):828-852.

[viii] https://www.nbcnews.com/health/mental-health/adderall-shortage-adhd-medication-2023-rcna99019

[ix] Socal, M. P., Ahn, K., Greene, J. A., & Anderson, G. F. (2023). Competition And Vulnerabilities In The Global Supply Chain For US Generic Active Pharmaceutical Ingredients: Study examines the competition and vulnerabilities in the global supply chain for US generic active pharmaceutical ingredients. *Health Affairs*, *42*(3), 407-415.

[x] https://www.cms.gov/newsroom/fact-sheets/cy-2024-medicare-hospital-outpatient-prospective-payment-system-and-ambulatory-surgical-center-0

[xi] https://www.brookings.edu/articles/federal-policies-to-address-persistent-generic-drug-shortages/

[xii] Kaygisiz NB, Shivdasani Y, Conti RM, Berndt ER. The geography of prescription pharmaceuticals supplied to the U.S.: levels, trends, and implications [Internet]. Cambridge (MA): National Bureau of Economic Research; 2019 Dec. (NBER Working Paper No. 26524). https://www.nber.org/system/files/working_papers/w26524/w26524.pdf