From World War II to COVID-19: A Historical Perspective on the American Medical Supply Chain

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Abstract

COVID-19 is the latest episode of shortages of critical medical supplies. Historically and to the present day, medical supplies have been sourced from single regions in the world, thus rendering the supply chain vulnerable to a myriad of harmful circumstances. We argue that shortages in medications related and unrelated to COVID have illustrated the need for the United States to diversify its medical supply sources before future pandemics, political crises, or natural disasters occur.

Introduction

COVID-19 is the latest episode of shortages of critical medical supplies. Historically, and to the present day, medical supplies have been sourced from single regions in the world, thus rendering the supply chain vulnerable to a myriad of harmful circumstances. We argue that shortages in medications related and unrelated to COVID have illustrated the need for the United States to diversify its medical supply sources before future pandemics, political crises, or natural disasters occur.

March 1942: The Japanese Empire occupies the East Indies, eliminating 90% of the world’s supply of quinine, the most effective antimalarial drug of the era. Cases of malaria constantly haunted the United States (U.S.) military throughout the war, impacting all theaters.

September 2017: Hurricane Maria devastates the territory of Puerto Rico, resulting in a shortage of intravenous (IV) saline across the United States. About 50% of U.S. hospitals relying on IV fluid from Baxter International scramble to find alternative supplies.

January-March 2020: SARS-CoV-2 emerges from China and rapidly evolves into a pandemic, resulting in disrupted production and exportation of medications and personal protective equipment (PPE) around the world. The ensuing shortages hamper the U.S. pandemic response.

Despite the separation in time and space, all 3 scenarios share 1 common mistake: a lack of diversity in sourcing essential medical supplies. As World War II erupted, Japan quickly captured Java, the epicenter for the world’s quinine production. The United States, caught off-guard, suddenly found itself facing malaria across the globe without sufficient treatment. This unpreparedness resulted in major hospitalizations from malarial infections throughout different battles and theaters. If the U.S. had invested into diversifying its quinine source well before World War II, the military would not have faced such a drastic shortage. Hurricane Maria devastated U.S. hospitals’ small-volume IV saline supply 80 years after World War II.

SARS-CoV-2 again highlighted how quickly an event around the world can rupture America’s healthcare supply. At the start of the pandemic, China supplied active ingredients for most medications in the US. Such dependence left the American healthcare system extremely vulnerable, and within a few weeks of viral spread in America, the demand on the medical system out-paced supply. Importantly, PPE shortages contributed to the chaos as well. Approximately 66% of the global glove supply was sourced from Malaysia. Yet, a disrupted workforce, and the desire to provide for its own country’s needs led to a global shortage that reverberated in America. The lack of source diversification created a perilous scenario for the U.S. and forced hospitals into impossible situations.
Conclusion

Diversifying supply sources may be the most effective way to prevent shortages. Healthcare leaders must examine which supplies are largely gathered from 1 region or nation, and then diversify. For almost 80 years, the U.S. has failed to effectively address seemingly perpetual supply shortages. Although the situation is undoubtedly complicated, source diversification is a vital first step. Soldiers, patients, and practitioners cannot keep waiting.

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