The Global Risks of Systemic Reliance on Critical Mineral Imports

TLP:WHITE This report may be shared without restriction. For Health-ISAC Members be sure to download the full version of the report from the Health-ISAC Threat Intelligence Portal (HTIP). Contact Membership Services for assistance.

Key Judgements

- There is an ongoing drug shortage that is highlighting some upstream issues with the global healthcare supply chain.
- Some metals critical to healthcare delivery are almost exclusively sourced from China.
- Trade obstacles created by geopolitical tensions have major ramifications on the procurement of certain metals, increasing the likelihood of shortages in the event of global conflicts.
- Dependence on imports of critical minerals is a systemic risk to the healthcare sector.
- Due to the unique risks posed by single-source minerals, preemptive risk mitigation strategies may better navigate the situation than reactionary measures.

Introduction

Shortages of medicine have been an ongoing issue for healthcare providers worldwide. These delays can lead to wait times for refills of prescription medicines. Some patients have reported wait times up to three months for refills of common prescriptions such as attention deficit hyperactivity disorder (ADHD) medication. According to a survey conducted by the data analytics firm Kaufman Hall, 71% of healthcare organizations are experiencing distribution delays in their supply chains in 2023. This issue is not unique to a geographic region with both the US and EU experiencing shortages.[1] Both of which have triggered policy at the highest levels to address one of the root causes, shortages of raw materials.[2]

The supply chain landscape changed dramatically after the COVID-19 pandemic. During the COVID-19 pandemic, the healthcare supply chain underwent immense stress as organizations scrambled to accommodate the massive influx of patients. This happened on a global scale, and supply soon began to fall behind the massive spike in demand. Through the race for medical materials, the vulnerabilities in the global supply chain were highlighted. The shortages during the pandemic were so significant that many pharmaceutical shortages still exist today.

Geopolitical Context

Against the backdrop of an already vulnerable healthcare supply chain, the Russia/Ukraine war further exacerbated shortages through widespread sanctions and the emergence of weaponizing trade dependencies to pressure geopolitical opponents. In the first six months of the war, two NordStream Liquid Natural Gas (LNG) pipelines running from Russia to the EU under the Baltic Sea were damaged beyond repair. This situation occurred during a flare in tensions between the EU and Russia over the war. The EU had been sanctioning Russian LNG, and when the undersea pipelines were destroyed, Russia began placing conditions on the repair of the pipelines as leverage to get EU leaders to reduce the number of sanctions. In response, the EU doubled down on sanctions and began to dedicate large resources to finding alternatives for Russian LNG suppliers.

In a broader sense, this highlighted the impacts geopolitical tension has on trade and set a precedent of banning the export of critical materials as a form of political pressure. It also set off a series of events that resulted in the EU reinvigorating efforts to become self-sustaining and looking to diversify its supply chain to ensure that the supply of critical materials into the bloc is uninterrupted.

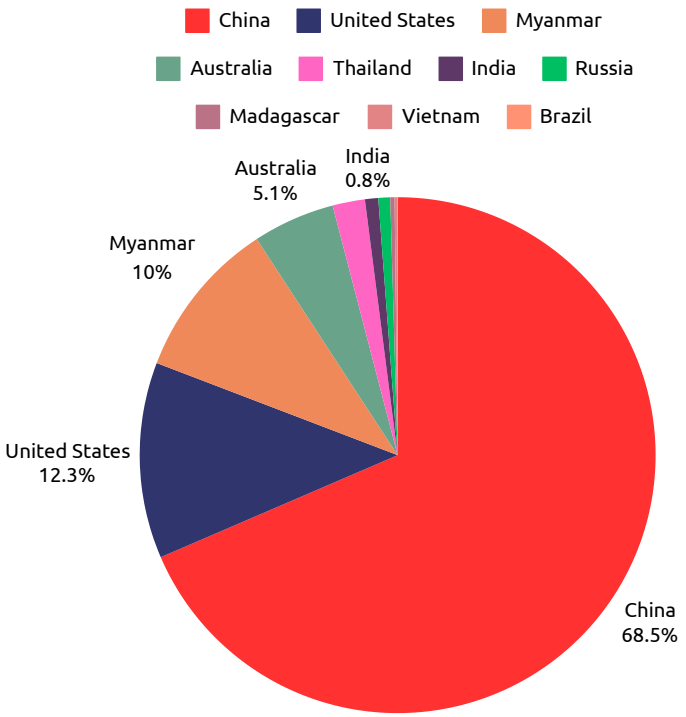
1 https://www.kaufmanhall.com/insights/research-report/2023-state-healthcare-performance-improvement-report
2 https://www.aha.org/aha-center-health-innovation-market-scan/2023-04-25-returning-normalcy-anything-health-care-supply-chain

The CHIPS Act and Critical Minerals

The CHIPS and Science Act was a piece of US legislation that allocated nearly $53 billion toward semiconductor research and manufacturing done in the US, attempting to offset the dominant position China held in the global semiconductor market.[3] This piece of legislation was likely perceived by the Chinese government as a statement of US intention to decouple with China in one of its most successful industries. In a move to apply pressure on the US and make the separation difficult, China banned the export of two rare earth metals that were essential for semiconductor manufacturing, gallium and germanium. This move showed that the supply of critical minerals was liable to be placed in jeopardy as tensions between nations strained. Such volatility is not sustainable long term, so the US and EU began the search for alternate suppliers of critical minerals and in-demand raw materials because China showed they were willing to weaponize supply chain dependencies to advance political agendas.

Dependence on External Critical Minerals

A 2018 study by the US Department of the Interior found that the US is completely reliant on other countries for 20 critical minerals, and many rare earth minerals are solely produced and processed in China.[4] This information illuminated the scope of dependence the US has on China regarding critical minerals essential for technological innovation, prompting policymakers to prioritizing finding critical mineral suppliers that are not beholden to Chinese export bans. In 2022, the US government released a statement labeling the Chinese control of minerals as a national security threat and allotting resources to find alternative suppliers.[5] The US has been working with allies to find new production and refinement avenues for these minerals in Western countries to insulate supply chains from geopolitical fluctuations, but there is still a long way to go. To illustrate the production gap in rare earth metals, to the right is a chart showcasing the global share of rare earth metals by country:[6]



3 https://www.whitehouse.gov/briefing-room/statements-releases/2024/08/09/fact-sheet-two-years-after-the-chips-and-science-act-biden-%E2%81%A0harris-administration-celebrates-historic-achievements-in-bringing-semiconductor-supply-chains-home-creating-jobs-supporting-inn/

4 https://www.doi.gov/pressreleases/groundbreaking-report-us-reliant-china-russia-other-foreign-nations-many-critical

5 https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/22/fact-sheet-securing-a-made-in-america-supply-chain-for-critical-minerals/

6 https://www.statista.com/statistics/270277/mining-of-rare-earths-by-country/

Struggles Overcoming External Mineral Dependence

Systemic dependence on other countries for critical minerals is a problem that is likely to persist for the foreseeable future due to environmental protections of the US and EU that make the process of getting a mining permit very difficult for domestic companies. In the absence of mining domestic mineral deposits, the next best solution is creating trade relationships with geopolitically aligned nations, minimizing the risk of any obstacles interfering with the flow of critical minerals.

There are some other countries that are aligned with NATO states that have the capacity to export critical minerals, such as Australia. Australia is a suitable supplier for many minerals, but it cannot support the growing demand of the modern era where technology is advancing at a rapid rate. So, the US and EU have begun trying to negotiate partnerships with mineral-rich countries in Africa to create infrastructure that would allow them to trade with the US and EU long term, but this is an uphill battle.

China holds a large presence in Africa as the major trade partner of many sub-Saharan nations. Specifically, China has invested heavily in the mining capabilities of major mineral-producing nations such as the Democratic Republic of Congo (DRC) with its near monopoly of the world's supply of cobalt, accounting for 70% of the cobalt in circulation today.[7]

China is the largest trading partner with Africa overall, utilizing a complex network of relationships with individual leaders and coalitions.[8] Not only does the US and EU have to gain the trust of these nations through better incentives and partnerships, but also overcome a cultural barrier that China has already overcame. Nevertheless, there have been some successes, such as the Lobito corridor project. An infrastructure initiative that spans Angola, Zambia and the DRC that will create roads for more efficient trade with Western nations through Angolan ports on the Atlantic Ocean.

Impacts of Critical Mineral Dependence on Healthcare

One of the most glaring examples of dependence on China for critical minerals is present in the market of the rare earth metal Yttrium. Yttrium has been labeled a critical mineral by the US, EU, Japan, and Brazil, and is used in MRI machines, medical lasers, biomedical implants, and drugs that treat the side effects of chemotherapy.[9] Between 2018 and 2021, China was responsible for 94% of the yttrium imported by the US,[10] showcasing the reliance the US has on Chinese rare metal production. According to the 2024 Yttrium commodity summary[11] published by the United States Geological Survey (USGS), the US has been 100% reliant on foreign importers for its supply of Yttrium since 2019.

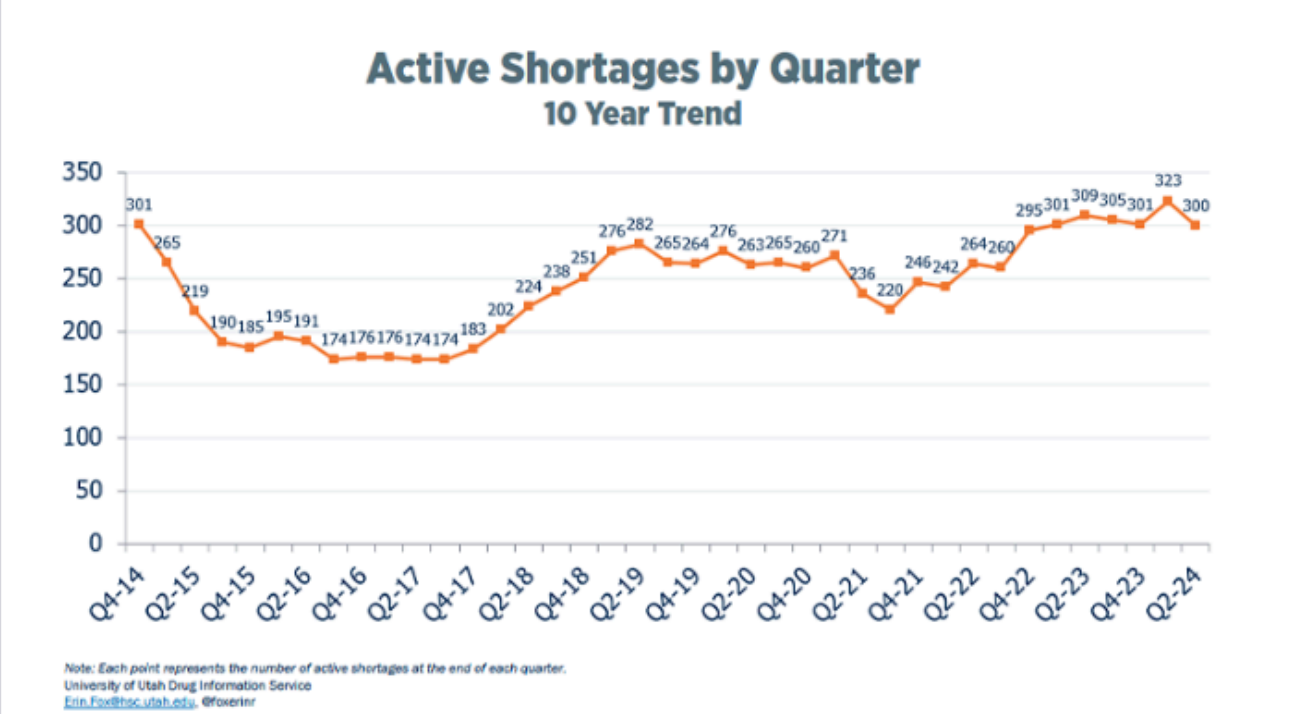
Yttrium is not unique. There are many other minerals that are nearly all imported to the US and other Western countries. Some examples are Gold, Iron, and Graphite. The systemic reliance on nations that are not geopolitically aligned with NATO introduces a risk to the healthcare supply chain that needs to be addressed, because the geopolitical landscape is becoming more volatile and political issues are being expressed in trade regulations.

7 https://www.nsenergybusiness.com/analysis/top-cobalt-producing-countries/?cf-view
8 https://www.cfr.org/backgrounder/china-africa
9 https://pubs.rsc.org/en/content/articlehtml/2020/cs/c9cs00840c
10 https://elements.visualcapitalist.com/china-dominates-the-supply-of-u-s-critical-minerals-list/
11 https://pubs.usgs.gov/periodicals/mcs2024/mcs2024-yttrium.pdf

In the event that a significant global conflict arises involving NATO, there is a high likelihood that it would severely hinder the ability for the NATO states to import critical minerals from key suppliers in nations that are not geopolitically aligned with NATO, such as China. This is a systemic issue for NATO critical infrastructure, including the healthcare infrastructure of member states. Critical minerals are used in nearly every facet of modern healthcare delivery, including medical device development, antibiotics, oxygen supplies, surgical equipment and more.[12] Without a reliable supply of critical minerals, the healthcare sector may be at risk for catastrophic shortages affecting a broad swathe of medical materials necessary to deliver optimal care to patients.

Conclusion

While the strain in tensions surrounding the raw mineral trade may not be directly correlated with the ongoing medicine shortage, it does represent systemic risk to the healthcare sector in the form of a single point of failure. At the time of writing, the healthcare supply chain is in a strained state. According to data collected by the American Society of Hospital Pharmacists (ASHP), the amount of active drug shortages in 2024 Q2 is higher than during the COVID-19 pandemic.[13]



A graph from ASHP showing the number of drug shortages per fiscal quarter over a 10 year period

From multi-national initiatives to build resilience in the healthcare supply chains of EU member states[14], to revisions of healthcare logistical resilience strategies at the national level, NATO states are posturing to change the way they approach the critical logistical elements of healthcare. Among the most notable measures, new strategies pertaining to the procurement of minerals and the manufacturing of sensitive technologies are being published as part of a broader reassessment of the medical material procurement process.

12 https://mineralsmakelife.org/blog/minerals-the-catalysts-for-medical-innovation/
13 https://www.ashp.org/drug-shortages/shortage-resources/drug-shortages-statistics?loginreturnUrl=SSOCheckOnly
14 https://www.euractiv.com/section/health-consumers/news/commission-launches-alliance-to-address-shortages-of-critical-medicines/

Some governmental healthcare organizations have advocated making use of domestic manufacturers when applicable and diversifying upstream suppliers of critical raw materials to build resilience while also minimizing the impact of a geopolitical conflict that may push nations to begin enacting export bans on critical minerals.[15] Healthcare organizations should consider incorporating systemic external reliance on critical minerals into existing business continuity and disaster recovery planning schemas. As tensions between NATO states and the largest producer of critical minerals, China, continue to strain, creating redundancy in the mineral supply chain may be a preventative measure to mitigate potential wide-reaching export bans that may be enacted in the near future. Systemic risk to critical infrastructure in the form of mineral monopolies and single-source critical materials affects us all, but the unique aspects of this issue make reactionary risk handling extremely difficult, potentially involving needing to find new suppliers and enduring elongated lead times that may lead to shortages. Therefore, predictive risk mitigation strategies in this context may be more advantageous for healthcare organizations.

13 https://www.ashp.org/drug-shortages/shortage-resources/drug-shortages-statistics?loginreturnUrl=SSOCheckOnly
14 https://www.euractiv.com/section/health-consumers/news/commission-launches-alliance-to-address-shortages-of-critical-medicines/
15 https://www.phe.gov/Preparedness/legal/Documents/National-Strategy-for-Resilient-Public-Health-Supply-Chain.pdf