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September 16, 2020

Medical Supply Chains and Policy Options: The Data Challenge

The Coronavirus Disease 2019 (COVID-19) pandemic has revealed some areas in which the United States relies heavily on global supply chains. U.S. shortages of critical supplies of medical products have prompted congressional interest in better understanding U.S. import trends and domestic production capacity in certain industries considered essential to U.S. public health and national security. Some Members of Congress and the Trump Administration have sought ways to increase U.S. production of medical products, such as personal protective equipment (PPE) and pharmaceuticals, by providing economic incentives to firms and strengthening government procurement requirements to better prioritize domestically produced goods.

Within this context, Congress has raised questions regarding domestic consumption of PPE and other medical products to understand the proportion of such goods that are produced domestically versus imported. Some Members have also sought a better understanding of the costs and feasibility of dismantling—and eventually reestablishing elsewhere—some global supply chains, and the extent to which domestic producers might be able to meet U.S. demand going forward. However, a lack of critical official data and information has impeded U.S. policy makers' ability to assess the size and composition of the U.S. market for specific products, and the overall production capacity of U.S.-based producers to satisfy various essential national needs. Compounding the challenge are definitional differences in the categorization of domestic and imported products that make it difficult to assess overall levels of U.S. import dependencies.

Domestic Supply: U.S. vs Foreign Made

In general, the U.S. government does not gather data on the domestic production of specific items (e.g., surgical masks and gloves) by quantity or value, nor does it track how much of this production is ultimately consumed in the U.S. market. Of U.S. domestic production, the U.S. government tracks categories of products that are exported to foreign markets. It also collects statistics for broad industry sectors, such as gross output, value added—also known as gross domestic product by industry, and intermediate inputs.

Another complicating factor in the analysis of U.S. production and U.S. imports of PPE, pharmaceuticals, and other medical products is that there are no domestic or internationally agreed guidelines, standards, or definitions of what specific products make up these categories. Therefore, questions such as "How much PPE does the United States currently produce relative to what it imports?" or "By how much has domestic production of pharmaceuticals increased since the COVID-19 outbreak?" are difficult to answer. Some agencies, including the Food and Drug Administration (FDA) and the Department of Commerce's Census Bureau and Bureau of Economic Analysis (BEA), collect more information than they make publicly available, in part due to confidentiality requirements. However, no U.S. government agency collects detailed statistics on the quantity and value of total U.S. production by product category.

Nonetheless, data from an annual government survey of U.S. manufacturers, analyzed in conjunction with official U.S. trade statistics, provides some insight into domestic production activities and a rough estimate of the share that some imported medical products make up in total U.S. supply.

Survey of Manufactures and Trade Statistics

The Census Bureau's Annual Survey of Manufactures (ASM) measures U.S. manufacturing activity, including industry outputs, inputs, and operating status. It provides sample estimates of statistics for U.S.-based manufacturing according to the North American Industry Classification System (NAICS). ASM statistics include the value added by manufacturing, total value of shipments for close to 1,400 classes of manufactured products, costs of materials, and inventories. NAICS categories, however, may not capture all medical production. A data time lag also prevents the U.S. government from developing a current understanding of industry trends; 2018 is the most recent year for which data are available.

The Census Bureau and BEA also collect data on U.S. exports and imports. By matching these datasets with the ASM, CRS was able to roughly estimate the imported—and thereby impute the domestic—share of U.S. supply for some NAICS categories considered to include PPE, pharmaceuticals, and other medical-related products in 2018 (**Table 1**). CRS calculated the figures at the NAICS 6-digit subheading level—the most disaggregated level for which the data are available. Because these are broad product categories, the data may at times underestimate or overestimate actual domestic production and imports.

These estimates suggest that the United States depends heavily on certain imports (for more than 90% of domestic supply in some cases), but foreign source dependence varies by product category. In 2018, the United States imported many low-end and labor-intensive manufactured products from China (e.g., apparel made from fabric, such as hospital gowns). Notably, some of the higher value-added and skill-intensive imported products came mainly from Europe (e.g., irradiation machines and biological products, such as vaccines) or were produced domestically (e.g., MRI equipment). The estimates likely understate the extent to which the United States relies on China for certain products, such as pharmaceuticals, as some U.S. imports may contain a high share of Chinese content but may not always be classified as Chinese in origin when imported into the United States.

Table 1. Estimate of the Imported Share of U.S. Domestic Supply: Selected Medical Products

Share of Domestic Supply (%) in 2018

NAICS Code and Description	Total U.S. Imports	U.S. Imports from the EU28	U.S. Imports from China
315220: Men's and Boys' Cut and Sew Apparel [medical and laboratory apparel]	98	3	20
315240: Women's, Girls', and Infants' Cut and Sew Apparel [medical and laboratory apparel]	96	3	36
333314: Optical Instruments and Lenses [microscopes, telescopes, prisms, lenses]	94	14	23
325414: Biological Products [vaccines, toxoids, blood fractions]	79	59	*
339115: Ophthalmic Goods [eyeglasses, contact lenses, protective eyewear]	60	22	20
313210: Broadwoven Fabrics [fabrics and felts, including surgical gauzes]	55	10	17
325411: Medicinal and Botanical Drugs and Vitamins [uncompounded medicinal chemicals and derivatives, botanicals]	48	34	8
325413: In-Vitro Diagnostic Substances [chemical, biological, or radioactive diagnostic substances]	48	27	3
325199: All Other Basic Organic Chemicals [isopropyl alcohol, glycerin]	42	14	9
334517: Irradiation Apparatus [X-rays and other ionizing radiation apparatus]	41	25	4
339113: Surgical Appliances and Supplies [orthopedic devices, prosthetic appliances, surgical dressings, crutches]	39	15	6
325412: Pharmaceutical Preparations [in-vivo diagnostic substances]	39	23	*
339112: Surgical and Medical Instruments [syringes, needles, caterers, anesthesia apparatus, blood transfusion equipment, medical thermometers]	36	10	2

Source: CRS analysis of data from the U.S. Census Bureau, U.S. Bureau of Economic Analysis, and the U.S. International Trade Commission.

Notes: (1) Rough estimates calculated at the NAICS 6-digit subheading level, which may cover products that are not for medical use; (2) * = Share of domestic supply is less than 0.05%; (3) descriptions in brackets are only selected examples of products covered by the subheading; and (4) estimates likely understate the extent to which the United States relies on China for certain products.

Other Sources of Data and Information

Capturing the U.S. government's reliance on foreign-made goods faces similar data limitations. The General Services Administration (GSA) maintains a database, the Federal Procurement Data System-Next Generation (FPDS-NG), for which federal agencies are required to report procurement contracts whose estimated value is $10,000 or more. However, there are documented issues about the accuracy, completeness, and timeliness of data in FPDS-NG. Despite these limitations, the data may still provide general information regarding the value, quantity, and types of domestic and foreign-made goods procured by U.S. government agencies. For example, analysts may rely on FPDS-NG data to identify broad trends and produce rough estimates, or to gather information about specific contracts.

Private research firms, trade associations, and media also offer information on domestic production capacity and production changes in response to the COVID-19 outbreak. Nevertheless, they often base their figures on surveys, firms' press releases, or firm/industry forecasts, which may differ significantly from actual production.

Issues and Options for Congress

Some Members have raised concerns regarding gaps in U.S. understanding of domestic manufacturing capacity and dependencies on China and other sources of global supply. Vulnerabilities regarding raw materials and inputs, such as active pharmaceutical ingredients, are not well recorded in official trade and industry data. They might be particularly difficult to track if they originate in one country but are then processed in another, reflecting modern supply chains. Another complication is the lack of a statutory definition of what qualifies as a "U.S. product" or what is "manufactured" in the United States, which may mask and understate the extent to which domestically produced goods rely on foreign inputs. In response to some of these concerns, the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136) has provisions that aim to help regulators and the public better understand medical supply chains. One example is the requirement for producers registered with the FDA to report annually to the agency the amount of drugs manufactured for domestic commercial distribution.

Domestic production data that more readily correlates with trade data—particularly in its timeliness and harmonization of definitions—would likely assist in analyzing the position of the U.S. economy and its industrial base in critical global supply chains. In particular, as China seeks to advance its position in the global supply chain through state-led industrial policies, such as *Made in China 2025*, it is targeting industries in which U.S. industry leads. Integrated data could help identify emerging industry and supply chain shifts in specific areas that may be occurring, at least partially, in response to China's policy incentives and pressures. Moreover, such data could support a strategic approach to U.S. supply chains that considers prospects and options to sustain U.S. leadership in critical sectors, such as advanced medical equipment and pharmaceutical innovation. More integrated data could better enable U.S. policymakers to understand the interplay of domestic and global developments and respond to them in time frames closer to real time, assess overall production capabilities of U.S.-based producers in sectors of concern, and better prepare for—and respond to—future crises.

A single legislative solution to measure and manage supply chain dependencies and risks may not exist. Congress, however, could consider—potentially as a first step—authorizing federal agencies to collect more data on firm's activities in the United States and abroad and at the points of U.S. import and government purchase. For example, the U.S. government currently surveys U.S. and foreign firms and reports on U.S. investment abroad and foreign investment in the United States. Agencies could obtain, analyze, and report specific supply chain information about the status of U.S. production and distribution without disclosing business confidential information. Congress could direct some agencies to collect data on federally owned public and defense stockpiles of certain items. Congress also might require an alignment of domestic and trade industry data to occur on an accelerated timeline. For more information, see CRS Report R46304, *COVID-19: China Medical Supply Chains and Broader Trade Issues*.

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