The COVID-19 pandemic exposed existing and long-standing vulnerabilities across multiple supply chains. Supply chain challenges that arose during the COVID-19 pandemic varied widely in terms of the strategies used by manufacturers, purchasers, and vendors to manage their inventories, and within distribution channels.[1,2] There have also been widespread labor and material shortages, disruptions in shipping supplies, and other challenges associated with fluctuating demand. Many products—food, cleaning supplies, hand sanitizer, thermometers, and testing kits, for example—became inaccessible or otherwise unaffordable in the early months of the pandemic.[3] Other important health care supply shortages have included dialysis materials, pharmaceuticals, and other essential products for patients with and without COVID-19.[4] Supply chain disruptions have also resulted in inadequate access to materials used in the production of other items, such as foam, lumber, and semiconductors, contributing to a variety of downstream effects on consumers.[5]

The drivers of supply chain challenges during the COVID-19 pandemic have been complex, and national and state-level experts have proposed many different solutions to improve supply chain resilience.[5–7] Some experts have proposed regionalizing the production of supplies to reduce foreign dependency and shifting away from "lean" manufacturing and procurement practices to build supply inventories in anticipation of distribution delays,[8,9] while others have suggested that sustainable, long-term solutions to ensure access to supplies should instead leverage the strengths of supply chain globalization and increase visibility into supply levels to inform strategic planning.[1,2] The strategies in **Chapter 3** represent actions recommended by the task force that can be undertaken at the local and state levels to build supply chain resilience in North Carolina. These strategies focus on personal protective equipment (PPE) and other supplies needed by the health care and frontline essential workforces in particular, although the task force emphasized the need for future efforts to investigate and address the wide-ranging impacts of shortages, distribution delays, and inadequate access to other essential supplies on North Carolinians during the COVID-19 pandemic.

Personal Protective Equipment and Other Health Care Supplies

In the decades that preceded the COVID-19 pandemic, scientists and other preparedness experts underscored the need to develop quality assurance processes and regulations for PPE during infectious disease outbreaks to protect health care and frontline essential workers, understanding that certain pathogens may require more stringent measures to mitigate exposure and infection risks.[10] Experts also identified a need for face masks and respirators that could be disinfected and reused during public health emergencies, along with the need to expand research into improving respiratory protection.[9,11,12] Although experts recognized and communicated the risk that PPE and other health care supply shortages were likely to occur during a pandemic or other infectious disease outbreak, health care and frontline essential workers in North Carolina and across the United States were still vulnerable when SARS-CoV-2 emerged in late 2019. North Carolina's Emergency Operations Plan, which is updated annually and as needed, includes a Communicable Disease and Biohazard Response Operations Plan that outlines the supporting role of the Office of Emergency Medical Services (OEMS) in coordinating and directing the activation and deployment of medical personnel, PPE and other supplies, equipment, and pharmaceuticals in collaboration with the Division of Public Health (DPH). North Carolina Emergency Management (NCEM), housed within the Department of Public Safety (NCDPS), serves as the lead state agency by providing technical assistance and coordinating overall emergency response efforts, while the DPH Public Health Preparedness and Response Steering Committee serves as the lead technical agency.[13]

An Overview of the Strategic National Stockpile (SNS)

The U.S. Congress first authorized $51 million in appropriations for pharmaceutical and vaccine stockpiling activities to be managed by the Centers for Disease Control and Prevention (CDC) in 1998. The SNS program was formally established as a result of the Public Health Security and Bioterrorism Preparedness Act of 2002, which directed the Department of Health and Human Services (HHS) to maintain a "Strategic National Stockpile" to "provide for the emergency health security of the United States, including the emergency health security of children and other vulnerable populations, in the event of a bioterrorist attack or other public health emergency".[a] The SNS includes medical equipment (such as ventilators), as well as pharmaceuticals and medical supplies, including PPE. The SNS program was transferred over to the Department of Homeland Security (DHS) as a result of the Homeland Security Act of 2002, although coordination with HHS continued until 2004, when the program was moved back to the HHS. From 2004 to 2018, the HHS—specifically the CDC—managed the SNS program with support provided by DHS. Since October 2018, the SNS program has been managed by the Office of the Assistant Secretary for Preparedness and Response (ASPR), an agency established in response to Hurricane Katrina.[14] ASPR's Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) program is charged with making decisions about supplies included in the SNS and coordinating with the CDC, Food and Drug Administration (FDA), National Institutes of Health (NIH), and interagency partners such as DHS and the Departments of Defense (DOD), Veterans Affairs (DVA), and Agriculture (USDA).[15]

[a] North Carolina Institute of Medicine and South Carolina Institute of Medicine and Public Health. Issue Brief: COVID-19 and the Carolinas State Responses and Federal Legislation to Address the Crisis. April 2020. https://nciom.org/wp-content/uploads/2020/04/COVID-Brief_final2.pdf Accessed July 14, 2022.

The COVID-19 Pandemic Response: Access to SNS Supplies

In the early weeks and months of the pandemic, state agencies were unable to obtain assistance from other states, which were similarly overwhelmed, and federal assistance from the Federal Emergency Management Agency (FEMA) and resources from the Strategic National Stockpile (SNS) program were either insufficient or inadequate.[16] In many ways, the federal government was ill-prepared to receive requests from all 56 state, local, tribal, and territorial (SLTT) governments, causing significant delays in processing and responding to requests. Evaluation studies focused on the SNS program during the COVID-19 pandemic have cited four points of failure: (1) unrealistic expectations about the capacity of the SNS, (2) historical underfunding of the program and public health preparedness efforts more broadly, (3) the lack of timely decision-making regarding supply chains, and (4) changes to the mission and scope of the SNS program by the federal government while simultaneously navigating the COVID-19 pandemic.[15] As a result of these and many other challenges in accessing support and resources, health care and frontline essential workers may remember the early months of the pandemic as a time when they were called upon to perform their job duties without the face masks, respirators, and other PPE they needed to be safe in environments where they contended with frequent exposure to SARS-CoV-2, and they may also remember the creative but imperfect solutions that were developed in response.

RECOMMENDATION 3.1

Although the regionalization (i.e., bringing the production of supplies closer to end users) of health care supply chains during the COVID-19 pandemic reflects resilience, the early months of the pandemic were defined, in part, by inadequate access to the supplies needed to protect the health care and frontline essential workers most at risk of exposure and infection with SARS-CoV-2.[17]

The increased demand for PPE and other supplies from not only other health care providers, but also the general public, has been unique to the COVID-19 pandemic. Competition for PPE and other supplies—particularly face masks, N95 respirators, and nitrile gloves—caused increasing prices and the proliferation of manufacturers and vendors operating without appropriate quality assurance and quality control processes in place .[18] Inadequate access to high-quality, reliable PPE endangers health care and frontline essential workers in addition to those they interact with at the bedside and in other settings should they become infected. Delays in care, rationing or denial of care, and increased risk of error when using new, unfamiliar, and alternative products can also result from inadequate access to PPE and other supplies. Importantly, trust in employers and institutions can be diminished when workers are expected to function without the supplies they need to do their jobs safely, understanding that they are at undue risk and could be passing that risk onto their patients, families, and communities.

Personal protective equipment (PPE) includes protective clothing, helmets, gloves, face shields, goggles, face masks and/or respirators, or other equipment designed to protect the wearer from injury or the spread of infection or illness.[19]

All PPE that is intended for use as a medical device must comply with the regulations set forth by the U.S. Food and Drug Administration (FDA). The FDA also states that "applicable voluntary consensus standards for protection" should be met. The regulations set forth by the FDA and the consensus standards vary depending on the specific type of PPE, but when followed, provide reasonable assurance that the device is safe and effective. Some types of PPE must be reviewed by the FDA before they can be legally sold in the United States.[19] For additional information, visit the FDA website: (https://www.fda.gov/medical-devices/general-hospital-devices-and-supplies/personal-protective-equipment-infection-control).

Strategies to Address the Shortage of Health Care Supplies During the COVID-19 Pandemic

Several strategies were developed and implemented at the national level to address health care supply shortages. The Coronavirus Aid, Relief, and Economic Security Act (CARES Act), which was signed into law on March 27, 2020, gives the U.S. Food and Drug Administration (FDA) the statutory authority to "help prevent or mitigate device shortages during, or in advance of, a public health emergency for the first time".[20] The FDA's budget for the current fiscal year (FY 2021–2022) also includes $21.6 million for a new Resilient Supply Chain and Shortages Prevention Program (RSCSPP) in the Center for Devices and Radiological Health (CDRH) to establish a permanent program for nationwide supply chain resilience for medical devices. This program will build on the FDA's work to implement CARES Act funding with the goal of strengthening domestic supply chains by investing in preventive measures, assessing potential health care supply product shortages, and continuing surveillance and rapid intervention efforts.[20]

The Defense Production Act (DPA), which can be implemented by the President and exercised by the FDA and other entities, provides emergency authority over domestic industries. In the early months of the COVID-19 pandemic, President Trump used this authority to limit hoarding and exportation of health care supplies, while also increasing production of essential supplies. Since taking office in January 2021, President Biden has focused on expediting vaccination and testing efforts.[21,b] The overall

effectiveness of the federal government's use of the DPA to increase the production and distribution of PPE and other health care supplies, and in monitoring and coordinating COVID-19 pandemic response activities more broadly, remains unclear,[22] although the President's ability to address supply chain issues under the DPA in an increasingly globalized market has been cited as a limiting factor.[23]

At the state level, the North Carolina General Assembly directed two divisions of the North Carolina Department of Health and Human Services and the North Carolina Department of Public Safety's Division of Emergency Management to coordinate on the development of a plan for a "Strategic State Stockpile" modeled after the SNS by July 1, 2020.[c]

Despite these important actions, additional efforts are needed to improve the resilience of the health care supply chain in anticipation of future COVID-19 surges and other public health emergencies. In response, the task force recommends seven strategies to protect the health and safety of health care and frontline essential workers:

RECOMMENDATION 3.1

Ensure adequate personal protective equipment (PPE) and other supplies to protect the health and safety of the health care and frontline essential workforces.

Strategy 3.1a: The North Carolina Division of Emergency Management should conduct a study to assess emergency declarations and other local, state, and national-level processes or mechanisms (including but not limited to the Defense Production Act) that could help to (1) shift the distribution of PPE and other supplies and (2) ramp up the production of PPE and other supplies in North Carolina in response to needs. This assessment should also identify strategies to strengthen communication with procurement and purchasing offices and support their understanding of PPE and other supplies needed during public health emergencies.

Strategy 3.1b: The North Carolina Department of Health and Human Services should develop and regularly update a policy manual to establish guidelines for stockpiling and monitoring PPE and other health care supply levels in partnership with the North Carolina Healthcare Association, North Carolina Health Care Facilities Association, North Carolina Medical Society, North Carolina Nurses Association, North Carolina Medical Group Management Association, and Western North Carolina Medical Managers Association. This policy manual should include guidelines around the collection, interpretation, and reporting of data on PPE and other health care supply levels and the distribution of these supplies.

Strategy 3.1c: The North Carolina Department of Commerce, NC Chamber, and other partners should work with hospitals and health systems to ensure the development of local infrastructure for PPE and other supplies in North Carolina.

Strategy 3.1d: The Office of State Budget and Management, in partnership with the North Carolina Department of Administration, should (1) survey North Carolina Department of Administration subcontractors that purchased and distributed PPE using CARES Act funding to assess the effectiveness of this model in streamlining PPE delivery to health care providers and facilities and (2) consider opportunities to modify procurement processes during public health emergencies based on the results of this assessment.

Strategy 3.1e: Building on the work outlined in Executive Order 143 and in the North Carolina Department of Commerce's Strategic Economic Development Plan for the State of North Carolina, the North Carolina Department of Administration should conduct an annual procurement planning survey to (1) identify local contracting opportunities for PPE and other needed supplies and (2) increase access to contracting opportunities for historically underutilized and other small businesses. The results of this survey should be publicly accessible and widely disseminated to support the North Carolina Department of Commerce, the North Carolina Pandemic Recovery Office, and other economic development partners in identifying and working to increase the manufacturing of PPE and other needed supplies locally.

Strategy 3.1f: The North Carolina Department of Commerce should partner with the NC Chamber and other economic development partners to consider opportunities to incentivize or otherwise encourage the formation of public and private sector partnerships to manufacture, purchase, or distribute PPE and other needed supplies in alignment with the North Carolina Department of Commerce's Strategic Economic Development Plan for the State of North Carolina.

Strategy 3.1g: The North Carolina Healthcare Association, NC Chamber, North Carolina Nurses Association and partners at the Duke University School of Medicine, UNC Health Care System, ECU Health, Atrium Health Wake Forest Baptist, and other North Carolina health systems should establish an advisory group to study the challenges associated with verifying the quality of PPE purchased from new suppliers and develop a plan to ensure the provision of high-quality PPE to health care providers and frontline essential workers.

[b] *Executive Order on a Sustainable Public Health Supply Chain, 2021 https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/21/executive-order-a-sustainable-public-health-supply-chain/*

[c] *House Bill 1037 https://www.ncleg.gov/Sessions/2019/Bills/House/PDF/H1037v2.pdf*

The following organizations are responsible for implementing the strategies included in Recommendation 3.1:

- **PUBLIC SAFETY:** North Carolina Division of Emergency Management
- **HEALTH:** North Carolina Department of Health and Human Services, North Carolina Healthcare Association, North Carolina Health Care Facilities Association, North Carolina Medical Society, North Carolina Nurses Association, North Carolina Medical Group Managers Association, and Western North Carolina Medical Managers Association, North Carolina health systems
- **BUSINESS:** North Carolina Department of Commerce, NC Chamber, local businesses
- **OTHER:** Office of State Budget and Management, North Carolina Department of Administration, North Carolina Pandemic Recovery Office

Strategy 3.1a

Tailoring the production and distribution of PPE and other health care supplies in response to needs.

The North Carolina Division of Emergency Management should conduct a study to assess emergency declarations and other local, state, and national-level processes or mechanisms (including but not limited to the Defense Production Act) that could help to (1) shift the distribution of PPE and other supplies and (2) ramp up the production of PPE and other supplies in North Carolina in response to needs. This assessment should also identify strategies to strengthen communication with procurement and purchasing offices and support their understanding of PPE and other supplies needed during public health emergencies.

DESIRED RESULT

Increased production of PPE and other supplies to meet the needs of all workers, particularly health care and frontline essential workers; ensure equitable distribution of these supplies; and reduce illness, hospitalization, and death.

WHY DOES THE TASK FORCE RECOMMEND THIS STRATEGY?

Emergency declarations and other local, state, and national-level processes and mechanisms designed to empower government officials during public health emergencies must be used prudently to be effective.[22] The task force recommends **Strategy 3.1a** with the goal of identifying opportunities to increase the production of PPE and other supplies to protect those at highest risk of exposure and infection: health care and frontline essential workers. **Strategy 3.1a** will produce an assessment of the processes that can be used to expand access to PPE and other supplies during public health emergencies—options that may not exist in the absence of an emergency declaration or the activation of other emergency powers. The effective use of these processes can ensure that North Carolina's residents—especially those at higher risk, such as health care and frontline essential workforces, as well as their patients, families, and communities—are better protected when called on during times of crisis.

ADDITIONAL CONTEXT

The North Carolina Division of Emergency Management, housed within the North Carolina Department of Public Safety, is the responsible entity involved in **Strategy 3.1a**. The Secretary of the Department of Public Safety is responsible to the Governor for all state emergency management activities outlined in the North Carolina Emergency Management Act, located in Chapter 166A of the North Carolina General Statutes. This act establishes the authority and responsibility of the Governor, state agencies, and local government for emergency management in North Carolina.[24]

Strategy 3.1b

Stockpiling and monitoring PPE and other health care supply levels to inform decision-making.

The North Carolina Department of Health and Human Services should develop and regularly update a policy manual to establish guidelines for stockpiling and monitoring PPE and other health care supply levels in partnership with North Carolina Emergency Management, North Carolina Healthcare Association, North Carolina Health Care Facilities Association, North Carolina Medical Society, North Carolina Medical Group Managers Association, and Western North Carolina Medical Managers Association. This policy manual should include guidelines around the collection, interpretation, reporting, and sharing of data on PPE and other health care supply levels and the distribution of these supplies.

DESIRED RESULT

Improved coordination around stockpiling and monitoring PPE and other health care supply levels between key partners, and data collection to better understand the needs of health care providers and guide decision-making to ensure the equitable distribution of these supplies.

WHY DOES THE TASK FORCE RECOMMEND THIS STRATEGY?

The lack of data on the PPE and other supply needs of health care providers, particularly among independent physician practices, was identified by the task force as a barrier to an effective response early on in the COVID-19 pandemic. Data to understand the needs of health care providers and increased visibility into supply inventories are essential to monitor supply levels and expiration dates, prevent waste and hoarding of supplies, and promote cost-effective spending and equitable resource allocation.[25] **Strategy 3.1b** will leverage existing efforts to establish a state stockpile, improve procurement processes, and ensure the equitable distribution of PPE and other supplies, while also standardizing the collection, interpretation, reporting, and sharing of data to provide inventory visibility and improved understanding of health care provider needs and their supply usage patterns.

ADDITIONAL CONTEXT

On May 4, 2020, Governor Cooper signed into law the COVID-19 Recovery Act, which directed two divisions within the North Carolina Department of Health and Human Services and the North Carolina Department of Public Safety's Division of Emergency Management to develop and submit a plan for stockpiling PPE and testing supplies for public health emergencies to the Joint Legislative Oversight Committee by July 1, 2020.[d] Modeled after the SNS, this plan outlines the creation and maintenance of a "Strategic State Stockpile" for PPE and testing supplies that would be accessible to "public and private acute care providers, first responders, health care providers, long-term care providers, and non-health care entities located within the State for the purposes of addressing the COVID-19 pandemic and future public health emergencies." The North Carolina Department of Health and Human Services is the responsible organization charged with leading the activities under **Strategy 3.1b**, given its important role in developing plans for the state's strategic stockpile under SL2020-3.

Strategy 3.1c

Developing local infrastructure for the production of quality-assured PPE and other health care supplies.

The North Carolina Department of Commerce, NC Chamber, local business, and other partners should work with hospitals and health systems to ensure the development of local infrastructure for quality-assured PPE and other health care supplies in North Carolina.

DESIRED RESULT

Increased access to quality-assured PPE and other health care supplies, reduced reliance on out-of-state and global supply vendors, and a stronger economy in North Carolina through the creation of new opportunities to support businesses across the state.

WHY DOES THE TASK FORCE RECOMMEND THIS STRATEGY?

The task force noted that reliance on federal support in the form of the SNS program and globally manufactured supplies represented a vulnerability in protecting North Carolina's health care and frontline essential workforces. **Strategy 3.1c** is intended to support the local production of health care supplies and long-term investments in the infrastructure needed to ensure access to these supplies. **Strategy 3.1c** should be understood to include infrastructure for the production of other health care resources that may be needed in the future, such as software and transportation.[9]

ADDITIONAL CONTEXT

During the COVID-19 pandemic, North Carolina developed creative solutions to meet the needs of health care and frontline essential workers. One such example involved North Carolina State University's Nonwovens Institute (NWI), Blue Cross and Blue Shield of North Carolina (Blue Cross NC), Freudenberg Performance Materials, UNC Health, the North Carolina Healthcare Association, and the North Carolina Medical Society, which partnered to manufacture N95 respirators to safely and cost-effectively equip health care and frontline essential workers across North Carolina.[26] **Strategy 3.1c** aims to build on this and other examples of innovation during the COVID-19 pandemic by incorporating the North Carolina Department of Commerce, NC Chamber, and other members of the business community into a partnership supporting the development of local infrastructure for PPE and other essential supplies to ensure that the state is better prepared for future COVID-19 surges and other public health emergencies.

Strategy 3.1d

Streamlining the procurement and distribution of PPE and other health care supplies.

The Office of State Budget and Management, in partnership with the North Carolina Department of Administration, should (1) survey North Carolina Department of Administration subcontractors that purchased and distributed PPE using CARES Act funding to assess the effectiveness of this model in streamlining PPE delivery to health care providers and facilities and (2) consider opportunities to modify procurement processes during public health emergencies based on the results of this assessment.

DESIRED RESULT

Streamlined procurement processes to expedite access to high-quality PPE and other essential supplies for health care and frontline essential workers at highest risk of exposure and infection.

WHY DOES THE TASK FORCE RECOMMEND THIS STRATEGY?

Government contracting regulations—specifically, regulations around purchasing and reimbursement—were identified by the task force as a significant limitation to swiftly obtaining PPE and other essential health care supplies early in the COVID-19 pandemic. Assessing the effectiveness of efforts to expedite the delivery of these supplies to health care providers and facilities in 2020 could illuminate opportunities to simplify procurement processes and ensure that health care providers have the supplies they need during public health emergencies and beyond.

ADDITIONAL CONTEXT

The North Carolina Medical Society, the North Carolina Health Care Facilities Association, and the North Carolina Healthcare Association—specifically, the North Carolina Healthcare Foundation and NCHA Strategic Partners—were awarded CARES Act funding by the Office of State Budget and Management (OSBM) to purchase and distribute PPE to health care providers and facilities

[d] *SB704/SL2020-3 https://www.ncleg.gov/EnactedLegislation/SessionLaws/HTML/2019-2020/SL2020-3.html*

in 2020.[27,28] These organizations accessed funds through contracts with the North Carolina Department of Administration to ease the administrative burden of the procurement process and distribute supplies to those on the front lines of the COVID-19 pandemic response. As the organizations that managed the distribution of these funds and the contracting process, OSBM and the North Carolina Department of Administration are the responsible organizations involved in **Strategy 3.1d**.

Strategy 3.1e

Increasing opportunities for historically underutilized and small businesses to expand access to PPE and other health care supplies.

Building on the work outlined in Executive Order 143 and in the North Carolina Department of Commerce's *First in Flight: Strategic Economic Development Plan for the State of North Carolina*, the North Carolina Department of Administration should conduct an annual procurement planning survey to (1) identify local contracting opportunities for PPE and other needed supplies and (2) increase access to contracting opportunities for historically underutilized and other small businesses. The results of this survey should be publicly accessible and widely disseminated to support the North Carolina Department of Commerce, the North Carolina Pandemic Recovery Office, and other economic development partners in identifying and working to increase the manufacturing of PPE and other needed supplies locally.

DESIRED RESULT

Increasing opportunities for historically underutilized and other small businesses to obtain contracts with the North Carolina Department of Administration for PPE and other needed supplies, a stronger economy that reflects reduced reliance on out-of-state and global supply vendors, and health care and frontline essential workforces who are better protected during public health emergencies.

WHY DOES THE TASK FORCE RECOMMEND THIS STRATEGY?

Minority-owned and small businesses energize local communities and sustain North Carolina's overall economy.[29] The COVID-19 pandemic has had disproportionate impacts on these businesses, necessitating the development of strategies to promote their recovery. **Strategy 3.1e** aims to imbed the procurement planning survey conducted in connection with Executive Order 143 into ongoing efforts by the North Carolina Department of Administration to ensure the viability of these businesses and expand their access to opportunities for state contracts. **Strategy 3.1e** also includes the publication of the annual procurement planning survey results, supporting the North Carolina Department of Commerce and other partners in their strategic plans around small business recovery and manufacturing infrastructure.

ADDITIONAL CONTEXT

The North Carolina Pandemic Recovery Office (NCPRO), established under Session Law 2020-4 (House Bill 1043), is charged with overseeing the distribution of $3.6 billion in federal relief funds to state agencies, local governments, nonprofit organizations, hospitals and health systems, educational systems, and research organizations, and promoting coordination among recipients of these funds.[30] Executive Order 143, signed by Governor Cooper on June 4, 2020, calls for NCPRO to work with the North Carolina Department of Administration's Office of Historically Underutilized Businesses (HUB) to support the economic recovery of minority-owned businesses across the state. Executive Order 143 recognized HUBs as essential to building and maintaining a "vibrant, sustainable, and diverse business community in North Carolina," and emphasized the disproportionate impacts of the COVID-19 pandemic on these businesses and the need to support and encourage their growth and development.[e] As a result, HUB was directed to coordinate with NCPRO and the North Carolina Department of Health and Human Services to ensure minority-owned and small businesses have access to economic recovery funds and contract opportunities with the state. In alignment with the goals and purpose of Executive Order 143, North Carolina Department of Administration leadership asked those involved in procurement processes in state agencies, institutions, and universities to complete a procurement planning survey to identify opportunities for these businesses.[29] The North Carolina Department of Commerce's *Strategic Economic Development Plan for the State of North Carolina* also includes a strategic focus on small business recovery.[31]

Strategy 3.1f

Strengthening partnerships to support the manufacturing, purchasing, and distribution of PPE and other health care supplies.

The North Carolina Department of Commerce should partner with the NC Chamber and other economic development partners to consider opportunities to incentivize or otherwise encourage the formation of public and private sector partnerships to manufacture, purchase, or distribute PPE and other needed supplies in alignment with the North Carolina Department of Commerce's Strategic Economic Development Plan for the State of North Carolina.

DESIRED RESULT

Ongoing public and private sector partnerships that include a strategic focus on addressing PPE and other health care supply needs, helping to ensure that health care and frontline essential workers are better protected during public health emergencies.

[e] *Executive Order No. 143, Addressing the Disproportionate Impact of COVID-19 on Communities of Color https://files.nc.gov/governor/documents/files/EO143-Addressing-the-Disproportionate-Impact-of-COVID-19-on-Communities-of-Color.pdf*

WHY DOES THE TASK FORCE RECOMMEND THIS STRATEGY?

Strategy 3.1f aims to build on existing momentum between public and private sector partners to develop solutions responsive to PPE and other health care supply shortages during the COVID-19 pandemic, and aligns with the strategic plan published by the North Carolina Department of Commerce, *First in Talent: Strategic Economic Development Plan for the State of North Carolina* (2021).

ADDITIONAL CONTEXT

Tactic 8.1 (develop a statewide comprehensive strategy that supports and enables North Carolina manufacturers to seize emerging opportunities utilizing automation and smart technologies) of the North Carolina Department of Commerce's *Strategic Economic Development Plan for the State of North Carolina* describes a partnership between the North Carolina Department of Commerce, the North Carolina Manufacturing Extension Partnership at NC State University, the Economic Development Partnership of North Carolina, NC Chamber, the Community College System, and others to address challenges integrating new technologies; building the appropriate infrastructure; enabling the development of new supply chains; building and enhancing the workforce; and supporting entrepreneurship and small business growth (p. 11).

Strategy 3.1g

Verify and ensure the quality of PPE purchased from new suppliers.

The North Carolina Healthcare Association, NC Chamber, and partners at Duke University School of Medicine, UNC Health Care System, ECU Health, Atrium Health Wake Forest Baptist, and other North Carolina health systems should establish an advisory group to study the challenges associated with verifying the quality of PPE purchased from new suppliers and develop a plan to ensure the provision of high-quality PPE to health care providers and frontline essential workers.

DESIRED RESULT

Increased understanding of the quality assurance challenges around PPE purchased from new suppliers during the COVID-19 pandemic and the development of solutions responsive to those challenges with the goal of ensuring access to high-quality, reliable PPE for health care and frontline essential workers.

WHY DOES THE TASK FORCE RECOMMEND THIS STRATEGY?

Health care and frontline essential workers are often at highest risk of exposure and infection, necessitating access to high-quality, reliable PPE to mitigate this risk and protect their health and well-being, as well as that of their patients, families, and communities. Without access to the resources needed to do their jobs safely, workers can lose trust in the organizations and institutions that are obligated to provide reasonable protections to ensure a safe, healthy working environment. Job satisfaction can be diminished as a result, contributing to retention challenges that may have downstream impacts on access to insurance coverage, high-quality care, and additional services for communities served.

Although the FDA is responsible for regulating PPE in the United States, the task force identified the need to assess the challenges associated with PPE purchased from unfamiliar and non-traditional manufacturers and vendors as part of North Carolina's response to the COVID-19 pandemic and develop strategies to ensure that health care and frontline essential workers are adequately protected moving forward.[20]

ADDITIONAL CONTEXT

Changing regulations and guidance around PPE quality, the use of supplies from new and non-traditional suppliers, and the absence of scientific data to explain evolving regulations and guidance have been challenges for North Carolina and many other states during the COVID-19 pandemic.[9] **Strategy 3.1g** aligns with the goals of the North Carolina Association of Healthcare Resource and Materials Management (NCAHRMM), which includes representation from the North Carolina Healthcare Association (NCHA), Duke University, and other health care system representatives committed to raising health care supply chain management standards.[32] **Strategy 3.1g** also leverages the existing momentum and expertise of NCAHRMM and includes other key perspectives to develop a plan to verify PPE for North Carolina's health care and frontline essential workforces.

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