

2020



MarketREPORT

# Personal Protective Equipment

Pandemic Impacts on the Supply Chain  
For Critical Medical Supplies

**HIDA**

**RESEARCH  
& ANALYTICS**



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December 2020

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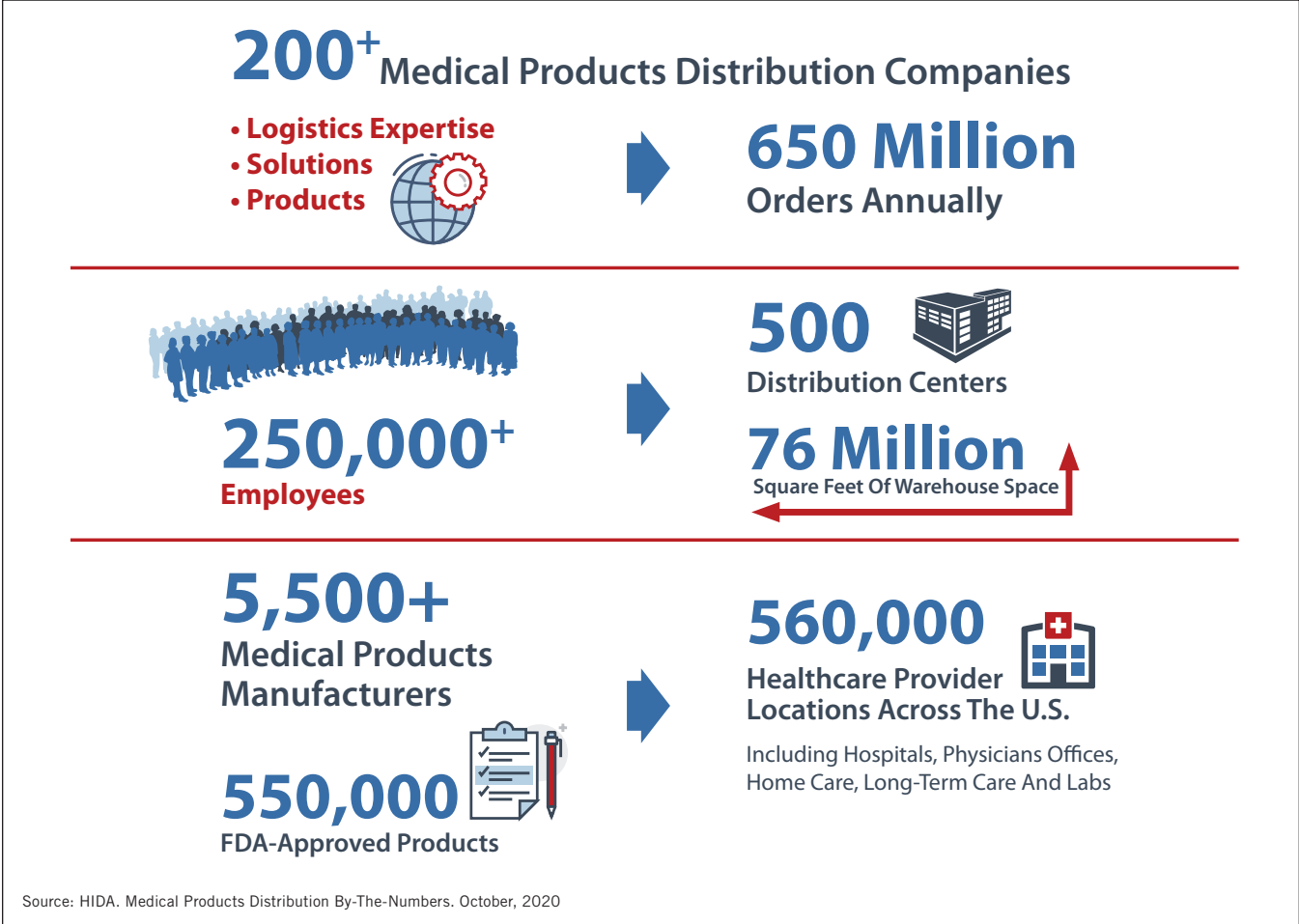
# Distributors Are Trusted Partners With The Infrastructure And The Expertise Stakeholders Count On

Throughout the pandemic, more than 200 U.S. health industry distributors demonstrated why they are recognized as trusted partners by healthcare providers, manufacturers and the government.

- Distributors delivered 60 billion units of pandemic-related supplies in the first half of 2020 to help healthcare providers continue to meet patient needs. This is a 16% increase over the same time period in 2019. Included in this number is over 26 billion units of PPE, a 24% increase.<sup>1</sup>
- They did so by capitalizing on their existing commercial distribution infrastructure that leverages 500 distribution centers and 76 million square feet of warehouse space to fill more than 650 million orders each year.
- In the throes of the crisis, distributors applied their expertise to find and vet new sources of desperately needed supplies, maintain stockpiles and allocate products to conserve inventory in order to make sure healthcare providers continued to have access to FDA-approved, medical grade equipment.

In short, distributors continued to do what they do every day: serve as the trusted link between more than 5,500 medical product manufacturers and 560,000 hospitals, physician practices, home care service, long term care facilities and laboratories.

**Exhibit 1 Medical Products Distribution By-The-Numbers**



<sup>1</sup> HIDA analysis of GHX data

# Executive Summary

The U.S. healthcare supply chain is strong, but the COVID-19 pandemic demonstrated it needs to be more resilient to respond to a sudden and massive increase in demand for medical products. This report:

- Analyzes the factors that contributed to a shortage of personal protective equipment (PPE) in the U.S.
- Examines the pandemic-driven forces that are likely to continue to impact the PPE market
- Highlights a framework proposed by the Health Industry Distributors Association (HIDA) to create a more robust pandemic response infrastructure in the U.S.

Shortages of PPE and other critical medical supplies during the pandemic are the result of a globalization of the PPE supply chain, a significant disruption of PPE supply at the beginning of the pandemic, and a rapid and sustained increase in global PPE demand caused by COVID-19. The key dynamics include:

- The concentration of PPE manufacturing in Asia during the last 40 years as part of an effort to bend the cost curve in healthcare
- COVID-19 related shutdowns and restrictions in PPE manufacturing centers in several countries
- Sudden and large increases in the need for PPE products as the pandemic swept through the U.S.
- Heightened competition for limited PPE supplies, not only among healthcare providers but also non-traditional consumers of PPE such as local governments, businesses and the general public

Sustained, increased demand for PPE will be the new normal in the immediate future and perhaps beyond. Projections are:

- Demand for surgical masks will increase 8.5% annually for the next four years
- A shortage of the raw material used for isolation gowns will continue to drive prices higher
- Increased demand and limited manufacturing capacity are combining to create what could be a 37% shortfall in nitrile gloves in 2021
- The entry of opportunistic brokers in the PPE market, new stockpiling initiatives, and competition between various types of customers continue to distort the market

To prepare for the next pandemic, HIDA has proposed a framework for pandemic response infrastructure anchored by:

- Forward-deployed PPE and Critical Product Reserves at 500 existing commercial distribution centers throughout the U.S.
- Expanded and diversified surge manufacturing capacity
- Sustainable and replenished federal stockpiles
- End-user aligned supply chains

Distributors have proven themselves to be the trusted partners of their healthcare provider customers. Their existing infrastructure, logistical expertise and market experience make them uniquely positioned to work with manufacturers, policymakers and providers to build a more robust healthcare supply chain for America.

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# Key Terms Used In This Report

## PPE

Healthcare providers rely on a wide variety of PPE, or personal protective equipment, to protect them from injury, infection and illness when treating patients.

Depending on the healthcare setting, PPE may include:

- Gloves
- Medical masks
- N95 respirators
- Eye protection, such as goggles or face shields
- Gowns
- Aprons
- Boots, shoes or their protective coverings

## FDA-Approved PPE

In the U.S., virtually all PPE used in a medical setting is subject to federal Food and Drug Administration (FDA) regulations and quality standards.<sup>1</sup>

In all, there are more than 550,000 types of healthcare products under FDA approval.<sup>2</sup>

Major categories of FDA-approved PPE include:

- Surgical masks
- N95 respirators
- Medical gloves
- Gowns

## Vetted PPE

Vetted PPE is equipment produced by manufacturers who can demonstrate that their products meet FDA standards for use in healthcare settings.

In the healthcare products supply chain, vetting manufacturers is a key expertise healthcare products distributors provide to their customers.

Distributors work with manufacturers to verify that their end products are of medical grade quality for use in the U.S.

## Healthcare Products Supply Chain

The healthcare products supply chain is a network of suppliers, manufacturers, shippers and distributors involved in moving healthcare products from the factory floor to the healthcare providers who use them.

### Manufacturers

There are more than 5,500 medical products manufacturers throughout the world.<sup>2</sup>

While many countries manufacture some portion of their medical products domestically, even major exporters of PPE need to import PPE for their own use.

### Distributors

Distributors secure and deliver medical supplies to healthcare providers for contracted prices.

In the U.S., more than 200 distributors connect global manufacturers to local healthcare providers, filling 650 million orders annually.<sup>2</sup>

Distributors save healthcare providers time and money while delivering the FDA-approved supplies they need.

### Providers

There are more than 560,000 healthcare providers in the U.S. including:

- 6,000 hospitals
- 15,600 nursing homes
- 28,900 assisted living facilities
- 12,200 home health agencies
- 230,000 physician offices and clinics
- 270,000 laboratories

<sup>1</sup> FDA. Personal Protective Equipment For Infection Control. February 10, 2020  
<sup>2</sup> HIDA. Analysis Of GHX Data. August, 2020

# PPE Is Part Of A Global Medical Products Supply Chain

Medical products used in the U.S. are manufactured domestically and around the world.

It is the medical products distribution supply chain that provides the access point for healthcare providers serving local communities.

- It relies on 500 commercial distribution centers totaling 76 million square feet of warehouse space located throughout the country.
- Most urban areas have at least one distribution center within a 50-mile radius.
- Distributors are constantly delivering products to healthcare providers, usually several times a week and, with some providers, daily.
- A distribution center typically has a 20-30 day supply of products that is constantly refreshed.

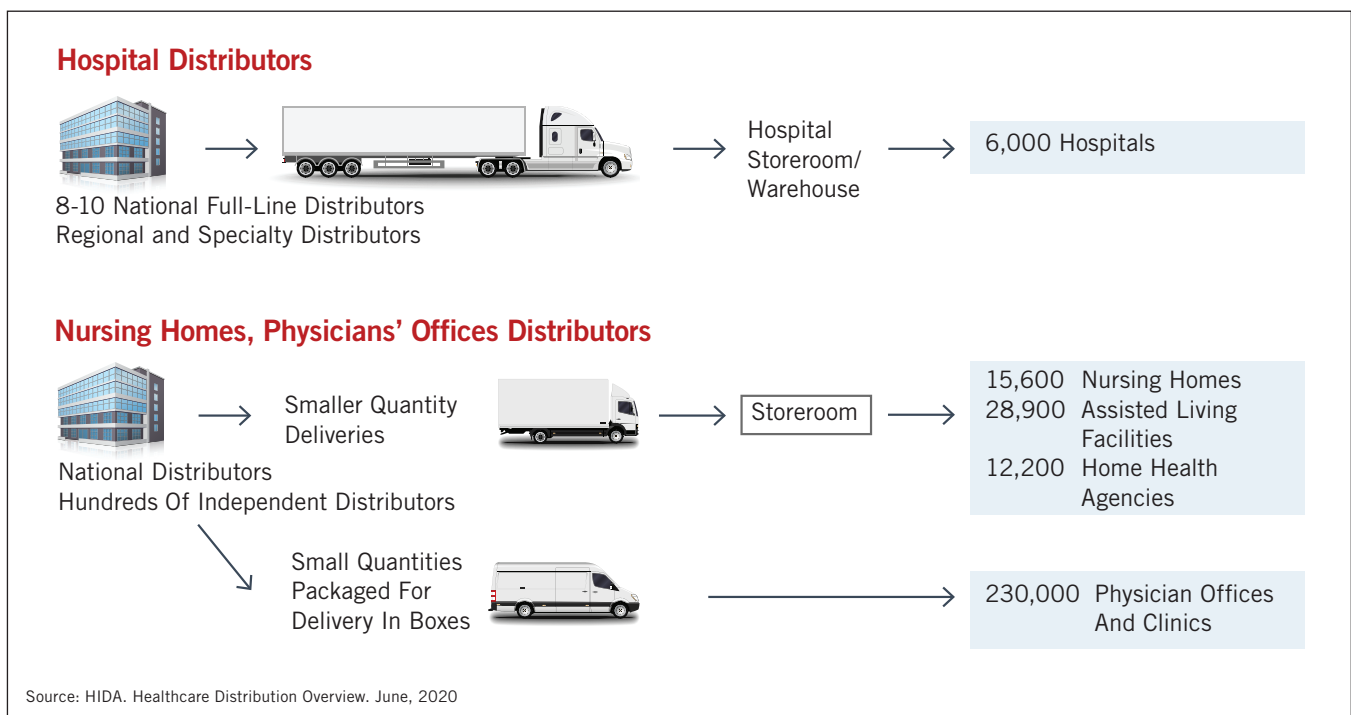
U.S. medical products distributors secure, store, and deliver thousands of products, including:

- PPE
- Diagnostics equipment, such as vials for blood draws
- Infection prevention materials, such as hand sanitizer
- Treatment products, such as needles and syringe kits

Distribution varies by provider setting.

- Hospitals are served by 8-10 national full-line distributors as well as a number of regional and specialty distributors.
- Post-acute care facilities, such as nursing homes and assisted living facilities, and physician offices and clinics may be served by national distributors or independent distributor companies.

## Exhibit 2 Distribution Varies By Provider Setting



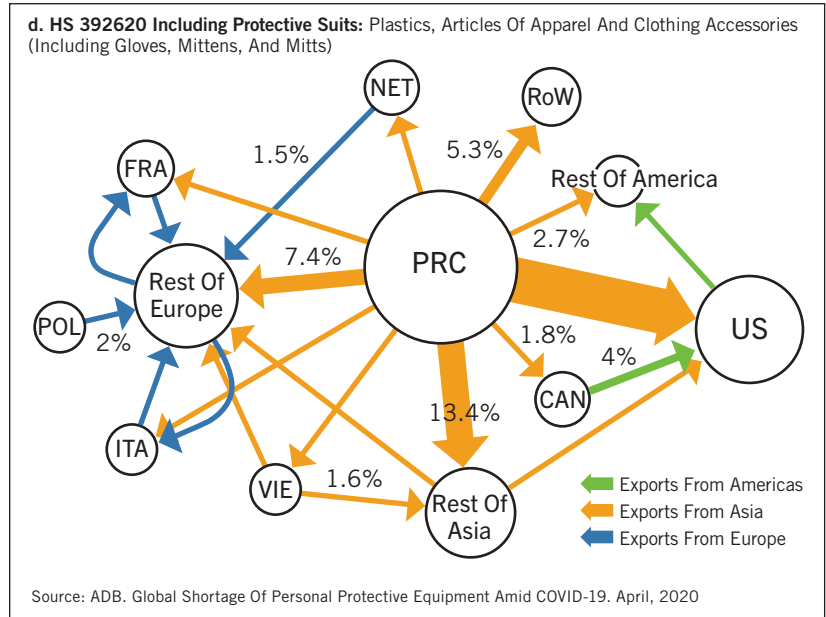
# The Globalization Of The PPE Supply Chain Has Concentrated PPE Manufacturing In Asia

The U.S. health industry supply chain globalized during the last 40 years to take advantage of the development of highly specialized, lower-cost manufacturing expertise outside the U.S.

This helped bend the healthcare cost curve in the U.S. but left the nation heavily reliant on a handful of overseas sources for large amounts of its critical healthcare supplies, including personal protective equipment (PPE).

- For example, China is the source of 72% of the surgical masks<sup>1</sup> and 54% of the medical gowns imported to the U.S.<sup>2</sup>
- Malaysia is the source of 65% of the world’s medical gloves.<sup>3</sup>

**Exhibit 3 Example Of Global Supply Chain Concentration In Asia (Protective Suits–2018)**



## COVID-19 Had An Immediate Impact On Both PPE Supply And Demand In The U.S.

A unique characteristic of the sudden and rapid spread of COVID-19 is that it caused major PPE manufacturing centers concentrated in Asia to close just at the time when demand for PPE was skyrocketing.

Both the lack of supply and the increase in demand stressed the supply chain resulting in global shortages felt acutely in the U.S.

*“Our data shows that many providers believed they were well equipped, only to see their stocks depleted in a matter of days as they started requiring increased use of PPE across a broader population of healthcare workers.” – Michael J. Alkire, Premier President. April, 2020*

<sup>1</sup> Medline Industries. Testimony to U.S. International Trade Commission, COVID-19 Related Goods: U.S. Imports and Tariffs. September 14, 2020

<sup>2</sup> HIDA. Testimony to U.S. International Trade Commission COVID-19 Related Goods: The U.S. Industry, Market, Trade, and Supply Chain Challenges. September 14, 2020

<sup>3</sup> Bloomberg Businessweek. The Pandemic Is A Bonanza For Malaysia’s Medical Glove Industry. April 21, 2020



# COVID-19 Related Shutdowns And Restrictions Caused A Significant Disruption In Supply

The shortages of PPE caused by COVID-19 were part of a supply problem, not a supply chain problem.

- As the COVID-19 pandemic began, factories in China were shut down for up to three months.
- Congestion at ports and shifting regulations in manufacturing countries led to further delays.

In response to COVID-19 outbreaks in their own region, several countries imposed international trade restrictions that impacted U.S. imports of PPE in 2020:

- Thailand restricted the export of masks beginning February 5
- Malaysia restricted the export of masks beginning March 7
- South Korea required 80% of masks to be distributed through public channels on March 9
- China started new certification/inspection requirements on medical supply exports effective March 31
- Vietnam restricted mask exports from March 11 through April 29<sup>1</sup>

Sixty-seven countries imposed 152 export restrictions on medical supplies, medical equipment, pharmaceuticals and other medical goods between January 1 and August 15.<sup>2</sup>

**Exhibit 4 U.S. COVID-19 Related Export Restrictions**



**China lifts 76-day lockdown on Wuhan as city reemerges from coronavirus crisis**



**Medical supply shortage in U.S. traced back to factory shutdown in China as it dealt with coronavirus**

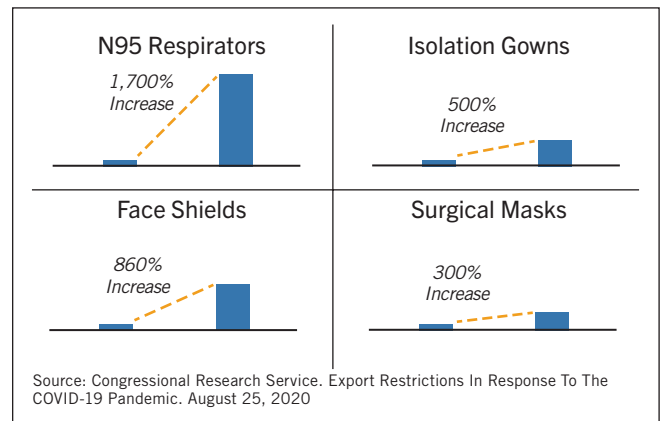
## COVID-19 Drove An Unprecedented Increase In PPE Demand

COVID-19 also created a tremendous and sudden increase in demand for PPE in the U.S. and around the world.

In March, some U.S. hospitals were using:

- 1,700% more N95 respirators
- 500% more isolation gowns
- 860% more face masks
- 300% more surgical masks<sup>3</sup>

**Exhibit 5 Early Surge In PPE Demand, March, 2020**



<sup>1</sup> Market Access Map. June, 2020

<sup>2</sup> Congressional Research Service. Export Restrictions In Response To The COVID-19 Pandemic. August 25, 2020

<sup>3</sup> Premier. Member Survey. March 16-20, 2020

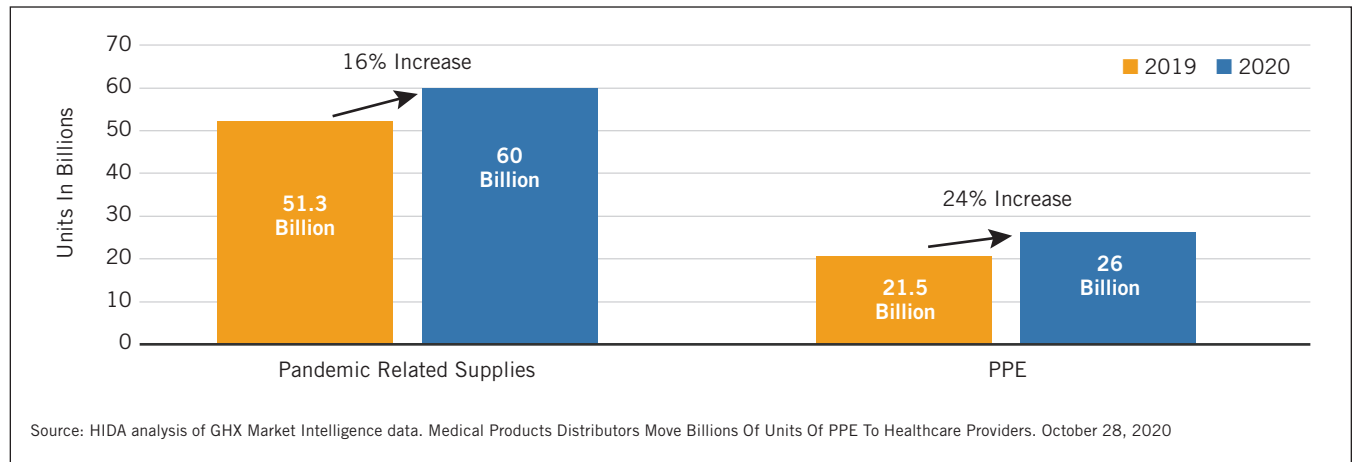
# As Trusted Partners, Distributors Responded Quickly

In the face of all these challenges, distributors continued to be trusted partners to healthcare providers by finding ways to deliver even more supplies at pre-pandemic, pre-negotiated prices. On a daily basis, distributors worked with healthcare providers to:

- Determine supply availability
- Identify appropriate equipment substitutions
- Vet alternative suppliers
- Project estimated delivery dates

In the first half of 2020, distributors moved 60 billion units of pandemic-related supplies, including 26 billion units of PPE. This marked a 16% and 24% increase, respectively over volumes shipped in the first half of 2019.

**Exhibit 6 Pandemic Related Healthcare Supplies Distributed in Q1 and Q2 Combined**



## Distributors And Suppliers Found Innovative Ways To Address Shortages

Throughout the pandemic, distributors and suppliers of commercial goods of all types are converting production to meet pandemic supply shortfalls.

- Lynn Medical, a family-owned distributor, partnered with a family-owned business in Michigan that was primarily a cut and sew shop for the automotive industry to produce isolation gowns.<sup>1</sup>
- Baltimore-based Under Armour is partnering with University of Maryland Medical System to produce masks, gowns, and supply kits.<sup>2</sup>
- Michigan's Spectrum Health partnered with local furniture manufacturer to make high-filtration masks.<sup>3</sup>

In addition, distributors advised providers regarding ways to conserve PPE, such as disinfecting masks and gloves to extend their use.

<sup>1</sup> Chris Fagnani. Testimony to U.S. House Small Business Committee Subcommittee on Economic Growth, Tax, and Capital Access Hearing: Supply Chain Resiliency. July 2, 2020

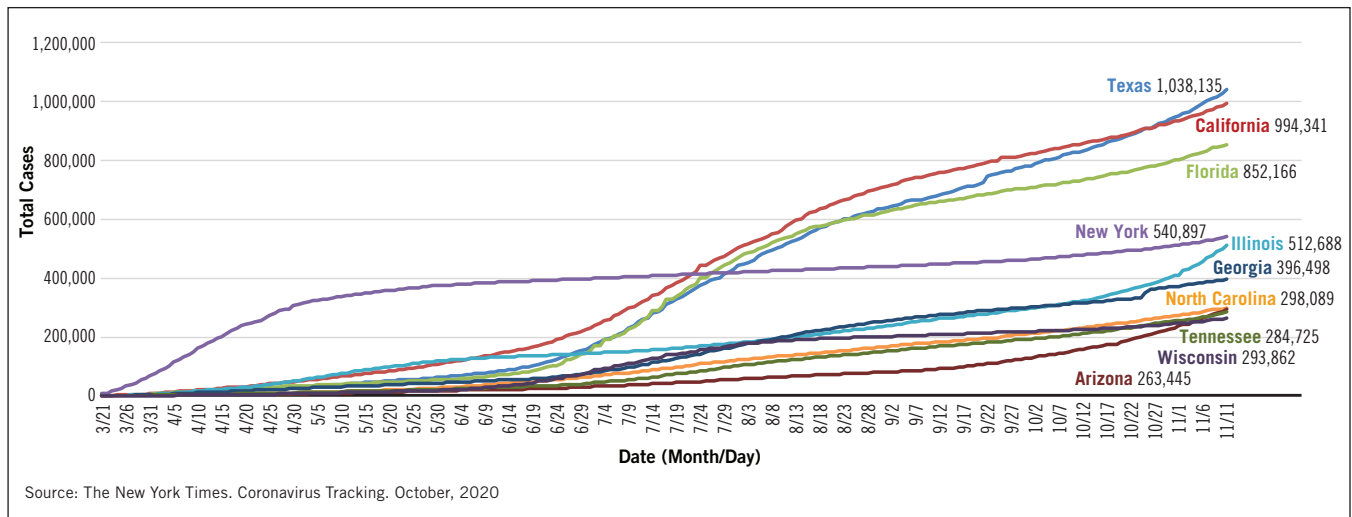
<sup>2</sup> Baltimore Business Journal. Under Armour To Make Protective Gear For Maryland Hospitals. March 31, 2020

<sup>3</sup> Spectrum Health Healthbeat. An Important Thing To Do. May 15, 2020

# Distributors Flex As Hot Spots Shift

- “Hot spots” – locations with a higher number of new cases, hospitalizations, and/or test positivity rates – have shifted frequently since the beginning of the pandemic
- Distributors coordinate with federal officials, states, manufacturers, and providers to respond to shifting hot spots

**Exhibit 7 States With The Greatest Cumulative Number Of COVID-19 Cases As Of October, 2020**



# Sustained And Increased Demand For PPE Projected Through 2022

The global fight against COVID-19 continues and the timing of the approval and distribution of an effective vaccine is still uncertain.

- Demand for critical PPE is expected to remain at historically high rates, compared to pre-COVID levels, at least through 2022.
- Demand for face masks and gloves is expected to be twice pre-COVID-19 levels in 2022.
- Demand for face shields is expected to nearly triple in the same amount of time.

**Exhibit 8 Healthcare PPE Demand Growth Index (Unit Volume 2019 = 100)**

	2019	2020	2021-22
Face Masks	100	165	200
Gloves	100	150	200
Clothing	100	200	225
Goggles/Face Shields	100	250	275

Source: Frost Sullivan. Impact Of COVID-19 On PPE. 2020

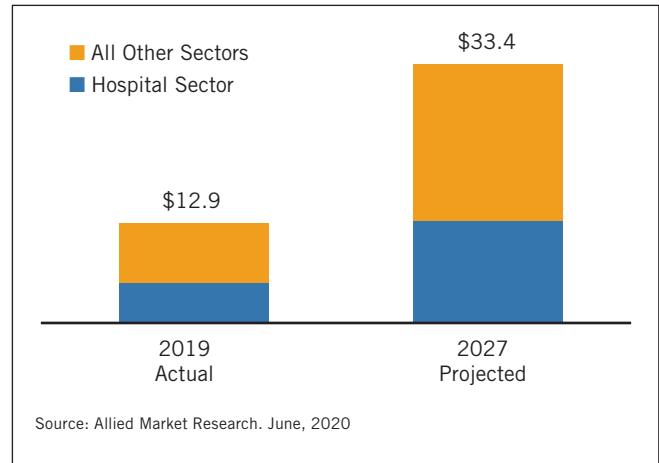
1 Washington Post. Hospitals Hope To Avoid Hard Choices Over Whom To Treat. November 12, 2020

# Global Hospital PPE Expenditures Are Expected To Nearly Triple By 2027

The global healthcare industry's spend on PPE is expected to increase over the next several years.

- Spending on PPE is forecasted to nearly triple by 2027.
- The global hospital PPE spending average growth rate is expected to be 13.1%, resulting in a \$13.4 billion market by 2027.
- The average annual growth rate for all healthcare segments is expected to be 12.4% from 2019 to 2027.
- Historically, global hospital PPE expenditure represents more than 40% of the global healthcare PPE market. This ratio is expected to continue.<sup>1</sup>

**Exhibit 9 Global Healthcare PPE Market (In Billions)**

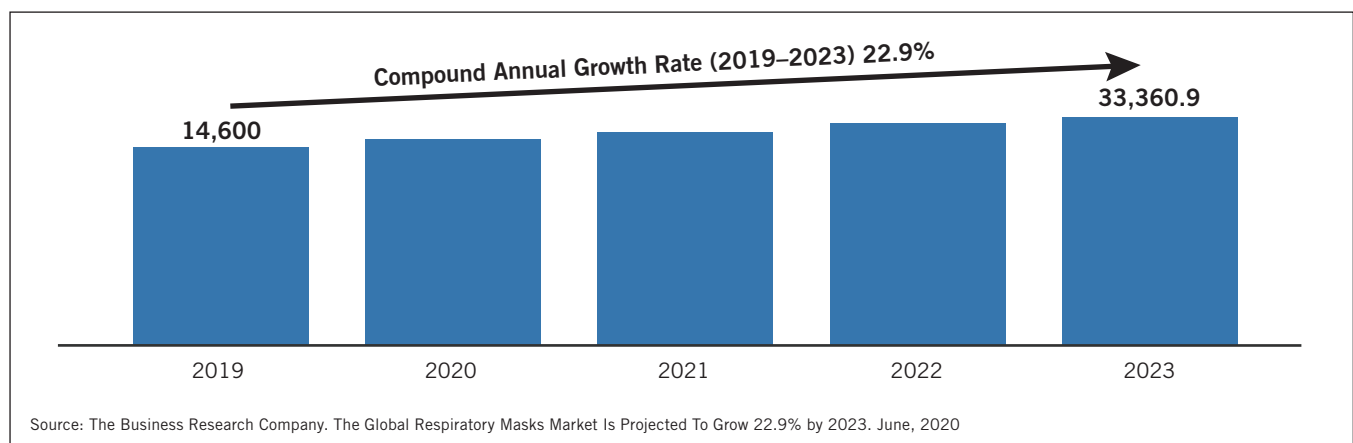


# COVID-19 Is Projected To Drive Up Global Demand For Masks 23% Per Year For The Next Four Years

The global PPE mask market, including N95 respirators and surgical masks, is expected to grow at annual rate of 22.9% during the next four years, from 14.6 billion units in 2019 to 33.4 billion units in 2023.

- This growth is attributed to a surge in demand due to COVID.
- Major manufacturers include Honeywell, 3M, Kimberly-Clark, Ansell, and Owens & Minor/Halyard Health<sup>2</sup>
- China supplied 25% of world exports of face masks in 2019.<sup>3</sup>

**Exhibit 10 Projected Global Mask Production (In Millions)**



<sup>1</sup> Allied Market Research. June, 2020

<sup>2</sup> The Business Research Company. The Global Respiratory Masks Market Is Projected To Grow 22.9% by 2023. June, 2020

<sup>3</sup> World Trade Organization. Trade In Medical Goods In The Context Of Covid-19. April 3, 2020

# COVID-19 Demand Created A Significant Shortage Of N95 Respirators

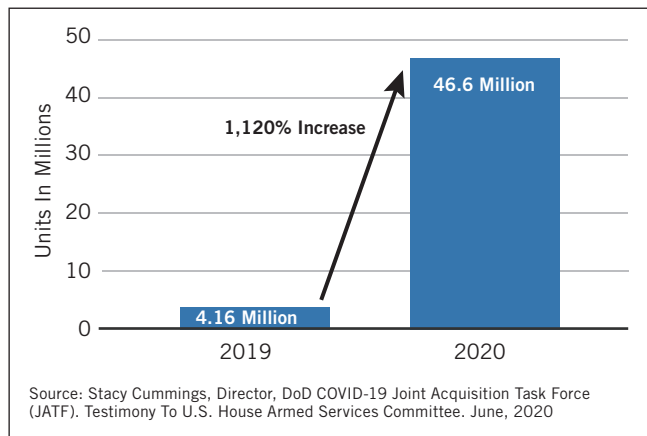
At the onset of the pandemic, demand for N95 respirators increased 1,700% over base levels.<sup>1</sup>

- U.S. health systems' purchases of N95s soared from 25 million in 2019 to 300 million in 2020.<sup>2</sup>
- Due to the increase in demand and limited supply, the price for N95 respirators increased as much as 700%.<sup>3</sup>

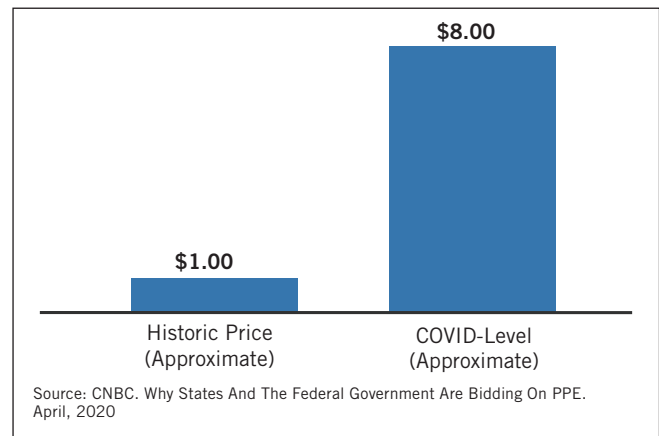


**N95 Respirator**  
Reduces wearer's exposure to particles including small particle aerosols and large droplets (only non-oil aerosols).

**Exhibit 11 Monthly Demand For N95s Increased 10-Fold During The Peak Of The Pandemic**



**Exhibit 12 Price Increase Of N95 Respirator Masks**



## U.S. Manufacturers Have Ramped Up Domestic Production Of N95s

According to HHS, 70% of respirators used in the U.S. at the time of the COVID-19 outbreak were made overseas.<sup>4</sup>

- China was the source of 50% of the world's N95 respirators.<sup>5</sup>
- 3M, the largest global producer of N95s, had respirator manufacturing lines in South Dakota and Nebraska as well as overseas

In response to the COVID-19 driven demand, manufacturers have significantly increased production.

- 3M stated that they are on track to double global production to 2 billion by year's end.<sup>6</sup>
- Department of Defense investments are expected to increase domestic production to a rate of more than 800 million masks per year by January and more than 1 billion per year by the end of 2021.<sup>7</sup>

1 Premier. Member Survey. March 16-20, 2020

2 Atlanta Journal Constitution. Months Into Pandemic, PPE Shortage Persists. October 7, 2020

3 CNBC. Why States And The Federal Government Are Bidding On PPE. April, 2020

4 Wired. Amid Coronavirus Fears, A Mask Shortage Could Spread Globally. February 4, 2020

5 Technavio. Coronavirus Outbreak Boosts The Sales of World's Top 10 N95 Mask Manufacturers. April 8, 2020

6 3M News Center. August 21, 2020

7 U.S. Department Of Defense. Domestic N95 Mask Production Expected To Exceed 1 Billion In 2021. June 10, 2020

# The Global Surgical Mask Market Is Projected To Grow 8.5% Annually Through 2027

At the onset of the pandemic, demand for surgical masks increased 300% over base levels.<sup>1</sup>

- Shortages were driven by increased demand as well as manufacturer shutdowns in China.

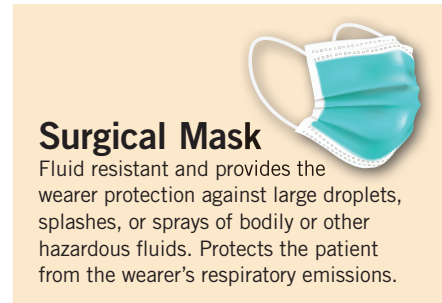
The U.S. Department of Health and Human Services (HHS) estimates 95% of surgical masks are made overseas, primarily in China.<sup>2</sup>

In response to pandemic-driven demand, China increased monthly masks production 12-fold in February 2020.<sup>3</sup>

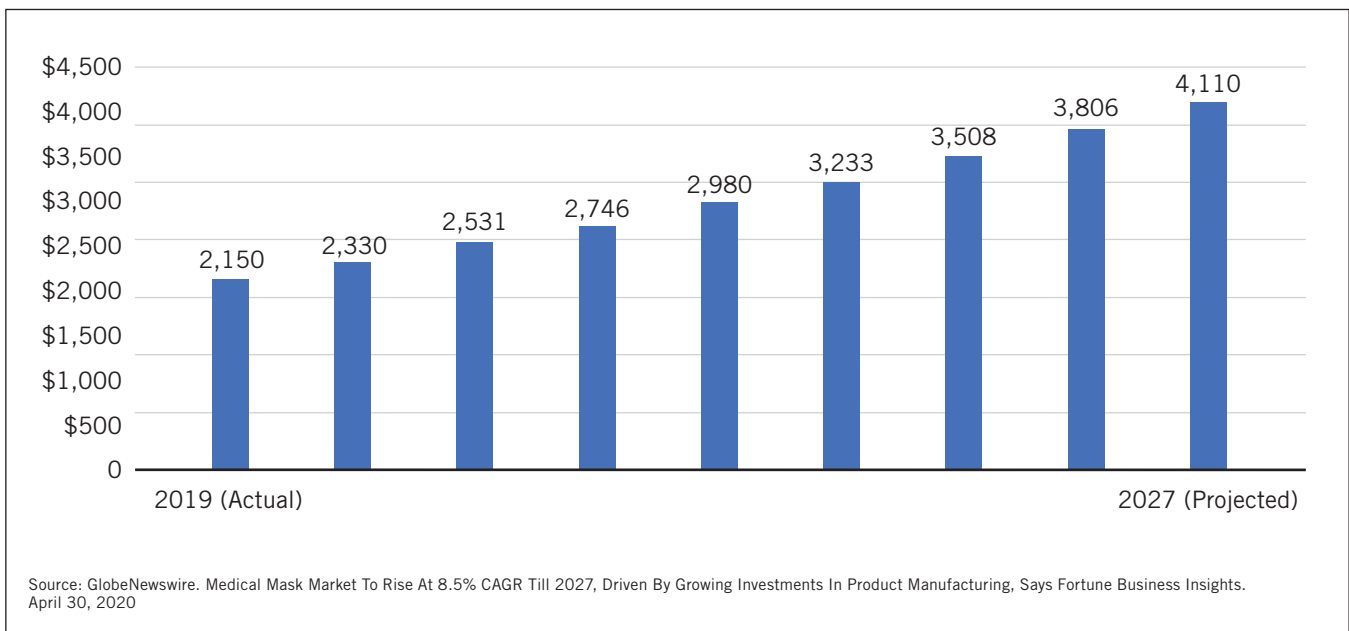
From March to May 2020, China exported 70.6 billion masks, more than three times the annual, total global pre-COVID-19 volume of 20 billion masks.<sup>3</sup>

\$2.15 billion in surgical masks were sold globally in 2019.

This market is expected to grow at an annual rate of 8.5% to \$4.11 billion by 2027.



**Exhibit 13 Projected Global Surgical Mask Sales (In Millions)**



1 Premier. Member Survey. March 16-20, 2020

2 Wired. How Decades Of Offshoring Led To A Mask Shortage In A Pandemic. March 29, 2020

3 New York Times. China Dominates Medical Supplies, In This Outbreak And The Next. July 5, 2020

4 Source: GlobeNewswire. Medical Mask Market To Rise At 8.5% CAGR Till 2027, Driven By Growing Investments In Product Manufacturing, Says Fortune Business Insights. April 30, 2020

# Increased Demand, Limited Raw Materials Contributed To Isolation Gown Shortages



Isolation gowns come in two types, disposable and reusable.

- Disposable gowns comprise 65% of market share and are made primarily of spunbond meltblown spunbond polypropylene synthetic fabric (SMS).
- Reusable gowns make up the remaining 35% market share and are made of liquid resistant polyester or carbon fabrics.<sup>1</sup>

As countries have limited exports, and raw materials have become scarce, providers are finding it harder to combat shortages.

- At the onset of the COVID-19 pandemic, hospital consumption of isolation gowns increased 500%.
- Prior to COVID, the average hospital was estimated to have a 4.5 day supply of isolation gowns. Since then, the average supply has fallen to 2.7 days.<sup>2</sup>
- In December of 2019, Johns Hopkins reported paying 40 cents per gown, a figure that has since risen substantially.<sup>3</sup>

## Providers Used Conservation, Substitutions, And Innovation To Address Shortages

74% of providers surveyed in April 2020 stated that securing isolation gowns was their top supply priority.<sup>4</sup>

- COVID-19 driven demand for PPE has created a shortage of SMS.
- Dozens of masks can be made from the same amount of material as a single gown.
- 22% of providers are working with unconventional suppliers such as clothing companies to source substitutions.<sup>5</sup>

Providers also adopted comprehensive conservation protocols to extend the life of PPE that would traditionally be discarded after a single use.

1 Grandview Research. Grandview Research. Hospital Gowns Market Size, Share & Trends Analysis. August, 2020

2 Premier. Member Survey. March 16-20, 2020

3 Advisory Board. Johns Hopkins Now Paying 20x More For Hospital Gowns. August, 2020

4 Premier. Member Survey. April 11-15, 2020

5 Premier. Member Survey. March 16-20, 2020

# Malaysia And China Are The Primary Manufacturers Of Gloves For The World



Medical gloves come in three types, latex (rubber), vinyl (synthetic plastic), and nitrile (synthetic acrylonitrile).

- Of the three types, vinyl gloves are less frequently used in healthcare as they are less durable and therefore less suited to high-risk tasks.
- Vinyl gloves have traditionally been used in post-acute settings as a barrier of protection for healthcare workers.
- However, latex and nitrile are more often used in hospitals as they are better suited to high-risk tasks.

Malaysia, China, and Taiwan are major producers of nitrile and rubber gloves.

- 65% of all medical gloves are sourced from Malaysia.
- Malaysian glove exports are expected to increase from 182 billion in 2019 to 240 billion pieces in 2020.<sup>1</sup>

## The Increased Glove Demand Is Causing Extended Lead Times On Shipping

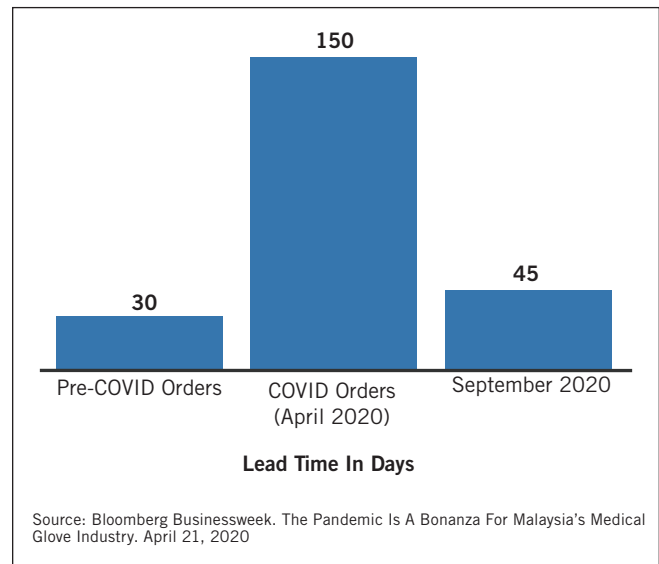
The demand for single use nitrile gloves, the most commonly used form of gloves in acute healthcare settings, has tripled during the COVID-19 pandemic.

- Demand is driven not only by hospitals but also by front-line workers, the general public and increased stockpiling efforts.
- Demand for single use nitrile gloves has surged by 200-300%.<sup>1</sup>

The largest global manufacturer of gloves (Top Glove, with a 26% market share) is reporting a 120 day increase in lead time (order fulfillment).

- Prior to COVID, lead time averaged 30 days
- As of April 2020, average lead time is 150 days<sup>1</sup>

**Exhibit 14 Lead Times For Glove Orders Pre- and During COVID**



<sup>1</sup> Bloomberg Businessweek. The Pandemic Is A Bonanza For Malaysia's Medical Glove Industry. April 21, 2020

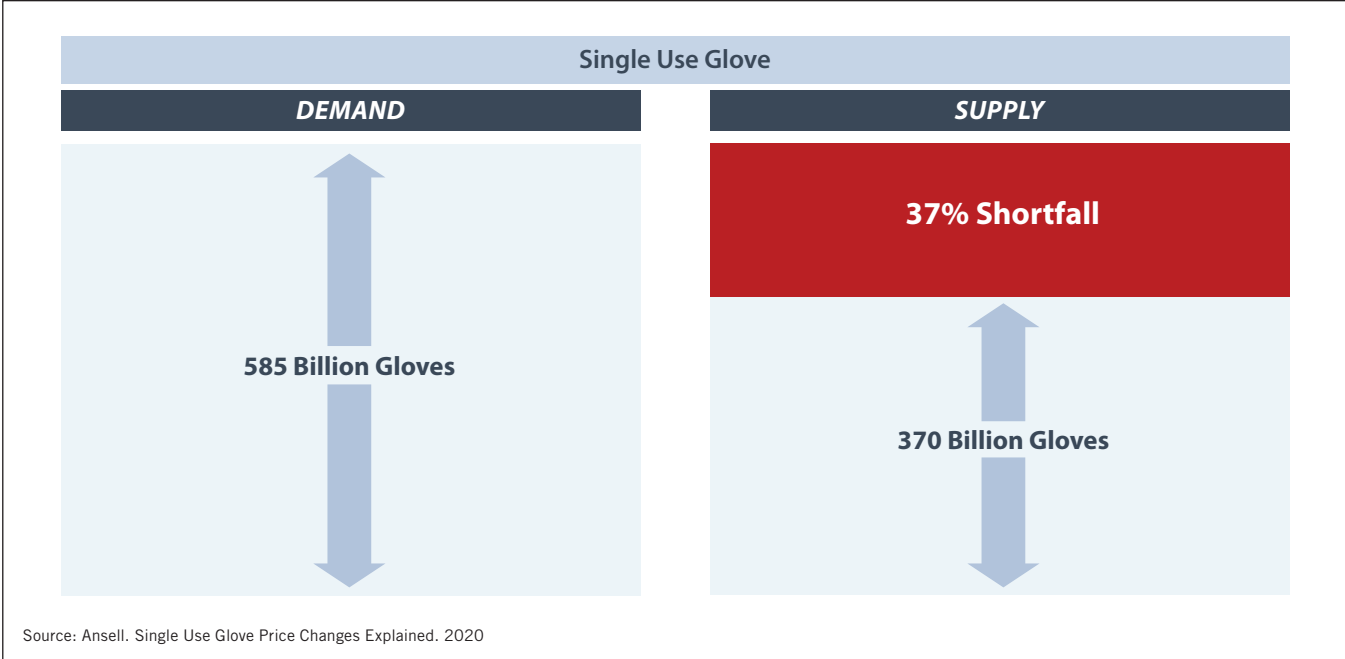


# A Lack Of Manufacturing Capacity Is Causing A Global Glove Shortage

During the COVID-19 pandemic, global demand for single use gloves has skyrocketed, exceeding the existing production capacity of manufacturers.

- Demand for gloves is projected to total 585 billion units in 2020.
- The current global capacity of glove manufacturers is 370 billion units.
- The estimated shortfall of 215 billion units represents 37% of expected demand.<sup>1</sup>
- While manufacturers are working aggressively to increase production, industry experts predict that significant shortages will likely persist into 2021.

**Exhibit 15 Global Glove Supply Is Limited**



<sup>1</sup> Ansell. Single Use Glove Price Changes Explained. 2020

# The COVID-19 Pandemic Continues To Create Challenges Across PPE Categories

Skyrocketing demand for PPE continues to create many challenges for the supply chain, including:

- The entrance of untested and unscrupulous brokers into the market
- Stockpiling initiatives by government and healthcare providers
- Continued competition for limited supplies among healthcare providers, government, and business

## Surging Demand Encouraged Opportunistic Brokers To Enter The PPE Market

An unforeseen challenge of the surging demand for PPE in response to COVID-19 was the emergence of a parallel PPE marketplace consisting of new, opportunistic brokers.

- Most had no expertise or experience in healthcare supply chains.
- They sourced products of unknown quality, including counterfeit products, from unknown vendors.
- They auctioned products to the highest bidder creating a pricing frenzy that artificially inflated the cost of the authentic product.
- Often, they failed to deliver the promised products.

Unlike distributors, brokers are not part of the supply chain. As trusted partners to healthcare providers, distributors:

- Purchase and deliver verified, safe, FDA-approved products from the factory to the doorstep of healthcare providers
- Operate under long-term contracts with factories, hospitals, and nursing homes
- Have deep expertise in identifying quality and efficacy in products
- Stick to agreed-upon pricing based on long-term contracts even as demand increases
- Jump into action to rush products to where they are needed

### *The Washington Post*

**Justice Department investigates Blue Flame Medical after claims that it failed to provide masks to Maryland**

### THE WALL STREET JOURNAL.

**Overwhelmed by Coronavirus, New York City Awards Contracts to Unproven Vendors**

### AP

**Counterfeit masks reaching frontline health workers in US**

### *The Washington Post*

**A contractor promised FEMA 10 million masks for \$55 million. It did not deliver.**

### *The New York Times*

***He Had Never Sold a Ventilator. N.Y Gave Him an \$86 Million Deal.***

# New Stockpiling Initiatives Threaten To Divert PPE Still Needed On The Front Lines To The Back Shelf

As a result of the PPE shortages caused by the pandemic, stockpiling initiatives now threaten to divert PPE still needed on the front lines to the storage shelf. These include:

- Ongoing restocking of the Strategic National Stockpile (SNS)
- Efforts by healthcare providers to create their own reserves to avoid future disruptions
- Proposals by policymakers at the state and federal level to establish stockpiles at the provider or state level

While well-intentioned, these measures may exacerbate shortages rather than solve them.

May 6, 2020 **The Washington Post**

*“...demand continues to outstrip supply because hospitals, states and the federal government are trying to stockpile supplies.”*

## 29 States Report Building Their Own PPE Stockpile

Twenty-nine states currently require a PPE stockpile.

- 17 states are building or maintaining stockpiles with a 90-day supply.
- An additional 12 states are accumulating stockpiles of various sizes.

Of the 29 U.S. states currently requiring a PPE stockpile:

- 86% are leasing or contracting storage facilities
- 56% are using state-owned facilities.<sup>1</sup>

**Exhibit 16** Count Of U.S. State Requirements For PPE Stockpiles

Day Supply	Number Of States
90-Day Supply	17
60-Day Supply	6
30-Day Supply	4
15–30-Day Supply	1
120-Day Supply	1

Source: NEMA. COVID-19 State Stockpile Survey Report. July, 2020

<sup>1</sup> NEMA. COVID-19 State Stockpile Survey Report. July, 2020

# Hospital Stockpiles Create Serious Financial And Functional Implications For Providers

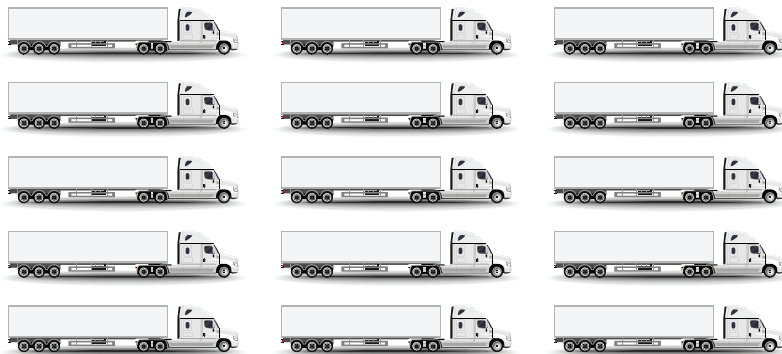
In an effort to increase preparedness, many policymakers are considering mandating that healthcare providers maintain their own 90-day stockpiles of PPE.

While well-intentioned, such mandates are likely to create additional supply challenges and costly administrative and logistical burdens. For example a 90-day stockpile mandate would:

- Cost the average 350-bed hospital as much as \$2 million. A recent study of margins determined hospitals could potentially end up 5–7% in the red.<sup>1</sup>
- Require the average 350-bed hospital to liberate approximately 5,700 sq. ft. of space, the equivalent of 13–15 tractor trailer loads.
- A similar requirement for a 5,000-bed hospital system requires reaches 81,000 sq. ft., the equivalent of 1½ football fields.
- These stockpile figures do not take into account COVID-related price increases.<sup>2</sup>

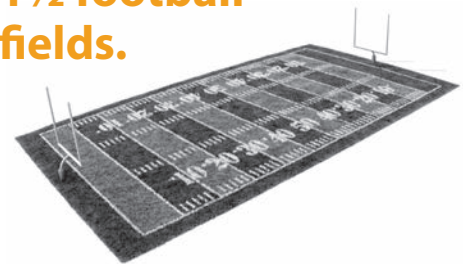
## Exhibit 17 Large Stockpiles Create New Logistical Challenges

A 90-day supply for a 350-bed hospital requires 5,700 sq. ft. of space — the equivalent of **13–15 tractor trailers.**



A 90-day supply for a 5,000-bed system requires 81,400 sq. ft. of space — the equivalent of

**1½ football fields.**



Source: HIDA. 90-Day PPE Stockpile Mandates Increase Shortages And Drive Up Costs. August, 2020

1 Premier. Member Survey. March, 2020

2 HIDA. 90-Day PPE Stockpile Mandates Increase Shortages And Drive Up Costs. August, 2020

# Competitive Purchasing By States Contributed To Increased Prices

While many factors led to the formation of a pandemic-driven opportunistic marketplace for medical supplies, one often-cited cause was confusion among providers and state governments about how to obtain supplies.

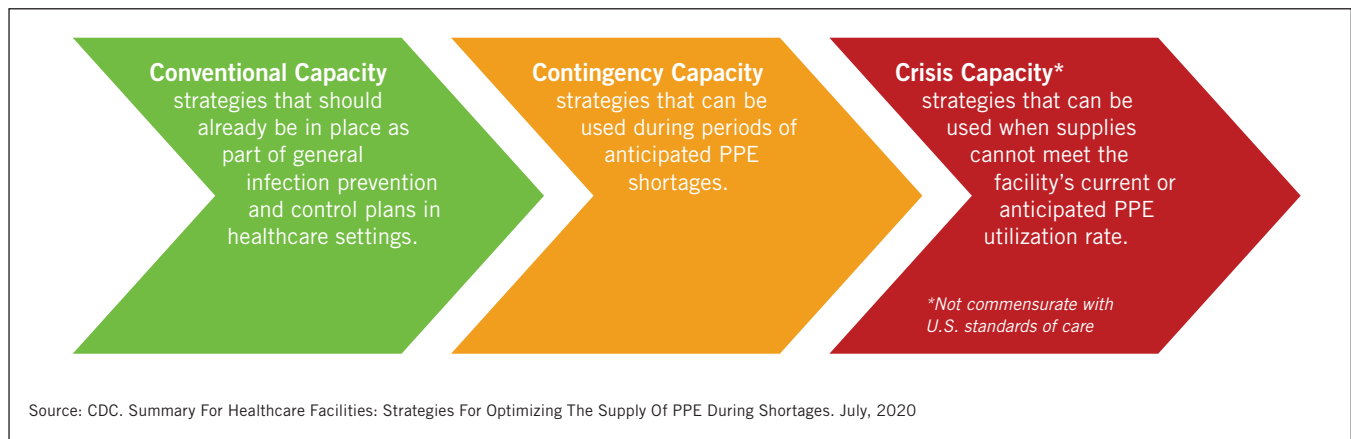
- This lack of clarity frequently initiated counterproductive bidding wars among the federal government, state agencies, healthcare providers and other customers for the same supplies and was a major enticement to unqualified, opportunistic brokers to enter the market.

Government buying entities acknowledge they are contributing to the problem of increased PPE prices by bidding against each other.

- Many of the transactions are facilitated by brokers, opportunistic dealmakers usually with no healthcare experience.
- In some cases states bid against the federal government to buy PPE for medical staff.
- In early response to this phenomena, 7 northeastern states banded together to procure \$5 billion in medical supplies.<sup>1</sup>

Strategies to mitigate shortages at the national level have largely focused on conservation of existing resources.<sup>2</sup> Current guidance from the U.S. Centers for Disease Control (CDC) classifies these strategies in three ways as shown in the chart below.

## Exhibit 18 CDC Strategies For Managing PPE Capacity



1 CNBC. Why States And The Federal Government Are Bidding On PPE. April, 2020

2 CDC. Summary For Healthcare Facilities: Strategies For Optimizing The Supply Of PPE During Shortages. July, 2020

# Increased PPE Production, More Conservation, And Larger Stockpiles Make America Better Prepared

The COVID-19 pandemic demonstrated that the medical products supply chain, which works efficiently to meet the needs of healthcare providers during normal operations, needs to have greater flex capacity to meet the demands created by a major public health crisis.

Since the outbreak, manufacturers, distributors, providers, and the government have been partnering in new ways to deliver the equipment healthcare providers need to care for their patients, both today and in the future.

By the fall of 2020, increased conservation efforts by healthcare providers, greater coordination among manufacturers, distributors, providers and the government, and expanded manufacturing capabilities were combining to make the supply chain more resilient.

## There Is More PPE Available Globally And Nationally

In response to skyrocketing demand for PPE, manufacturers both at home and abroad continued to increase PPE production throughout the summer and fall.

The global trade in medical goods grew 40% in the first half of 2020 as traditional manufacturing centers increased capacity and production.<sup>1</sup>

- Since February 2020, China increased its annual production of the specialty textile used to make masks by 500%.<sup>2</sup>

In addition, more countries have undertaken initiatives to produce PPE domestically in order to become less dependent on PPE manufacturing centers concentrated in Asia.

- The U.K. estimates that 70% of its PPE is now sourced domestically, up from 1% prior to the COVID-19 outbreak.<sup>3</sup>
- Canada recently announced that since the pandemic started it now purchases nearly 50% of its PPE domestically as compared to just .2% prior to the onset of COVID-19.<sup>4</sup>

The U.S. government has also moved aggressively to encourage more domestic PPE manufacturing capacity.

- Federal contracts for N95 masks have helped drive a 400% increase in the domestic production of respirators, from 45 million per month prior to COVID-19 to the current 180 million.<sup>5</sup>
- By October, the Strategic National Stockpile had made new investments totaling \$638 million in domestic facilities for pandemic-related supplies and equipment, including PPE.<sup>6</sup>

Despite these efforts, PPE supplies remain constrained into the fall as several regions of the U.S. experience spikes in COVID-19 cases and hospitals restock inventories.

- In particular, nursing homes and physician offices in some areas continue to report difficulty in obtaining the amount of PPE they want.<sup>7</sup>

1 WTO. WTO Issues Report On Measures To Expedite Access To COVID-19 Critical Goods, Services. September 16, 2020

2 New York Times. China Dominates Medical Supplies, In This Outbreak And The Next. July 5, 2020

3 U.K. Department Of Health And Social Care. Huge Increase In UK Personal Protective Equipment Production. September 28, 2020

4 Politico. Bains: Domestic Industry Now Supplying Half Of Canada's PPE Need. September 30, 2020

5 Wall Street Journal. N95 Face Mask Makers Ramp Up Production To Meet U.S. Covid-19 Demand. July 17, 2020

6 U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness And Response. SNS 2.0: The Next Generation. October 21, 2020

7 Modern Healthcare. Why State Mask Stockpiling Orders Are Hurting Nursing Homes, Small Providers. October 30, 2020

# Conservation Measures And Medical Protocols Are Making COVID-19 Treatment Less PPE Intensive

As the duration of the pandemic has increased, healthcare providers, particularly hospitals, have developed protocols to treat patients using less PPE than at the onset of COVID-19.

- Hospitals have adopted PPE conservation strategies promoted by federal agencies and organizations such as the American Hospital Association to reduce their usage of PPE when treating COVID-19 patients as well as regular admissions.<sup>1,2,3,4</sup>
- New treatment techniques have reduced the average length of stay for COVID-19 patients from approximately 12 days to seven days.<sup>5,6</sup> U.S. hospitals have also seen a decrease in the mortality rate of COVID-19 by as much as 70%.<sup>7</sup>

As a result, hospitals have also been able to resume non-essential surgeries while also treating COVID-19 patients.

- As of April 2020, total hospital admissions had declined by 30% as hospitals canceled elective surgeries. By October 2020, total hospital admissions had rebounded to 90% of pre-COVID-19 levels.<sup>8</sup>
- Major hospital chains such as Tenet Healthcare and HCA Healthcare have managed to maintain elective procedure schedules even during regional spikes of COVID-19.<sup>9</sup>

## Healthcare Providers And Policymakers Are Creating And Replenishing Stockpiles

Even before recent legislative and regulatory proposals to require healthcare providers to maintain substantial stockpiles of PPE were enacted, providers were already working to replenish and expand their PPE reserves.

- As early as March, 90% of healthcare providers were working to add to stockpiles of medical supplies and drugs, even as they battled COVID-19.<sup>10</sup>

The federal government has committed to a sizeable replenishment and expansion of the Strategic National Stockpile.

- The goal of its SNS 2.0 program is to have a 90-day capacity of critical supplies .
- It has invested \$8.8 billion to procure PPE, ventilators, and medications to add to its reserves.
- Its currently has 8 times as many N95 respirators and ventilators on hand than its pre-pandemic inventory.<sup>11</sup>

Similarly, state and local governments are undertaking initiatives to build their own reserves.

- Many states are establishing stockpiles of PPE and other medical supplies with target sizes of a 60-100 day supply.
- States are also spurring new PPE production through multi-state purchasing compacts and tax incentives to reshore PPE production within their borders.<sup>12</sup>

1 CDC. Optimizing Personal Protective Equipment (PPE) Supplies. July 16, 2020

2 FDA. Surgical Mask And Gown Conservation Strategies –Letter To Health Care Providers. April 27, 2020

3 FEMA. Addressing PPE Needs In Non-Healthcare Setting. July 21, 2020

4 American Hospital Association. Coronavirus COVI-19: Supplies And Personal Protective Equipment (PPD). September 29, 2020

5 Colorado Public Radio. New Hospital Data Shows Ventilator Use Fell Over Time And Coronavirus Patient Stays Grew Shorter. October 16, 2020

6 Mustread Alaska. Dunleavy: Hospitalizations for COVID patients are getting shorter in Alaska. October 21, 2020

7 Advisory Board. Death rates for hospitalized Covid-19 patients have fallen sharply. What's driving the drop? October 22, 2020

8 Epic Health Research Network. Trends in Overall and Non-COVID-19 Hospital Admissions. October 19, 2020

9 Wall Street Journal. Hospitals Balance Covid-19 Care With More-Lucrative Services During Latest Virus Surge. October 26, 2020

10 Premier. Premier Inc. Calls For National Stockpiling Standards To Prevent Redundant Efforts, Next Wave Of Product Shortages. June 30, 2020

11 U.S. Department of Health and Human Services, Office of the Assistant Secretary for Preparedness And Response. SNS 2.0: The Next Generation. October 21, 2020

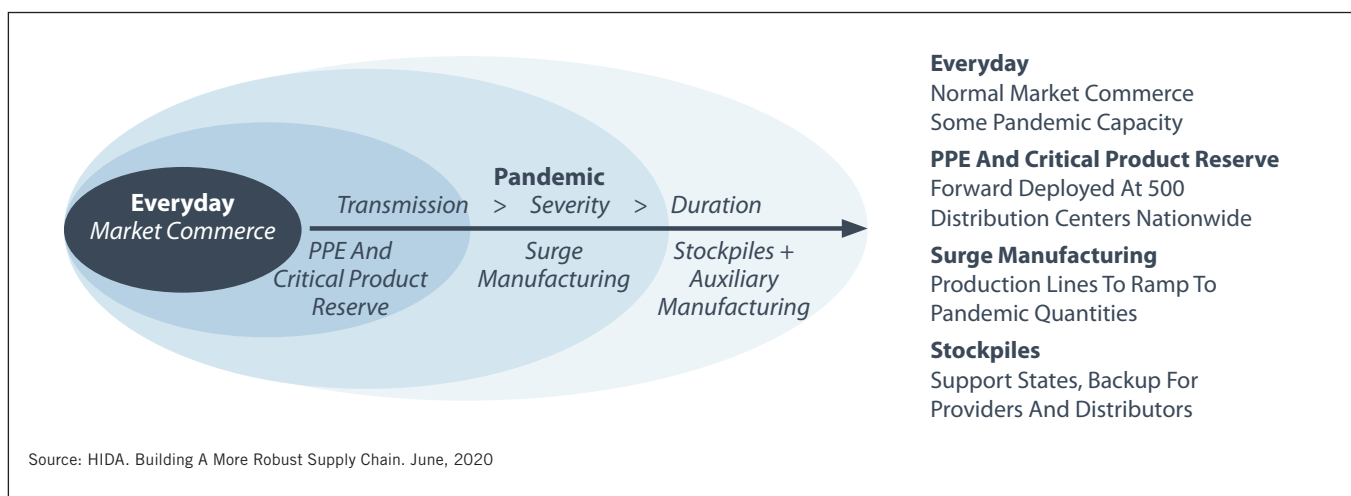
12 National Governors Association. Strategies To Address The Need For Personal Protective Equipment As States Gradually Reopen. July 28, 2020

# HIDA Has Identified Key Elements Of A More Robust Pandemic Response Infrastructure

To prepare for the next pandemic event, HIDA has proposed a framework for a pandemic response infrastructure built on four pillars:

- Forward-Deployed PPE And Critical Product Reserve
- Diversified Surge Manufacturing Capability
- Sustainable And Replenished Stockpiles
- End-User Aligned Supply Chains

**Exhibit 19 A Public-Private Framework To Leverage Distributor Logistical Expertise With Federal Planning And Financial Resources**



## The First Line Of Defense Should Be Forward-Deployed PPE And Critical Product Reserves

The first line of defense would be stocks of federally funded and controlled pandemic supplies.

- They would leverage the 500 commercial distribution locations throughout the U.S.
- This would position inventory close to healthcare providers.
- The reserves would be designed to meet their “first-call” needs for 30-60 days until surge manufacturing capability can be mobilized.





# The U.S. Should Expand And Diversify Its Surge Manufacturing Capacity Of Pandemic Supplies

Significantly expanded U.S. and nearshored manufacturing capacity would create a more strategic blend of sources capable of surging to increase volume in 30-60 days to keep customers and stockpiles supplied during a pandemic.

- Creating this additional capacity requires extensive experience, time and commitment to build new manufacturing infrastructure, execute quality checks, and navigate FDA regulations and environmental considerations.
- To successfully build on current infrastructure and develop new infrastructure, the industry needs the support of government partners.
- Specifically, the industry needs long-term contracts running a minimum of 36 months, with committed volumes.
- Some product categories may require even longer terms, depending on the capital and labor investments necessary for domestic production.



# The U.S. Should Maintain Sustainable And Replenished Stockpiles Of PPE And Medical Supplies

The federal government should also maintain and expand centralized stockpiles to be replenished by the surge manufacturing infrastructure.

- Stockpiles would support state and local government needs during a crisis
- Stockpiles would serve as a backstop to the commercial supply chain.



# Stakeholders Should Work To Establish Clear End-User Aligned Supply Chains For Medical Products

To be effective, a pandemic response infrastructure needs to provide clarity for end-users. To provide that clarity, government, distributors and customers should work to align distribution channels to categories of end users.

This would avoid creating competitive bidding for products – bidding that would drive up prices and encourage profiteering brokers.

## Exhibit 20 End-User Aligned Supply Chain

End User	Primary Supply Channel
Healthcare Providers	• Medical Products Distributors
Medical Laboratories	• Medical/Lab Distributors • Scientific Distributors • Manufacturers
Public Sector Essential Workers	• Government Procurement • Healthcare Distributors
States, Counties, Cities	• Government Procurement/Stockpiles • Federal Stockpile
Private Sector Essential Workers	• General Office Suppliers • Industrial Suppliers • Healthcare Distributors • Retail Suppliers
General Public	• Retail And Online

## Congress Should Pass Legislation That Capitalizes On The Existing Supply Chain Distribution Network

One model for creating a more robust pandemic response infrastructure can be found in HIDA-supported legislation that has been introduced with bipartisan and bicameral support in Congress.

- The legislation creates a partnership between the federal government and commercial distributors to establish and manage a national reserve of key supplies.
- It taps the logistical expertise of distributors to meet priorities that are clearly set by the federal government.
- It also directs the Strategic National Stockpile to work with manufacturers to diversify production and increase capacity.<sup>1</sup>

COVID-19 has demonstrated how interconnected the healthcare supply chain is. A strong public-private partnership leverages interconnectedness to make us safer.

<sup>1</sup> U.S. House of Representatives. H.R. 6531 Medical Supplies for Pandemics Act of 2020. April 17, 2020

# Understanding Healthcare Distribution

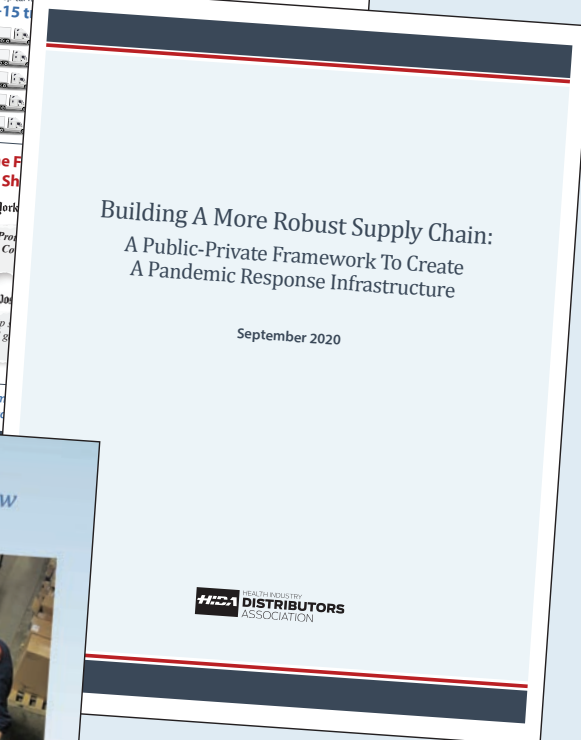
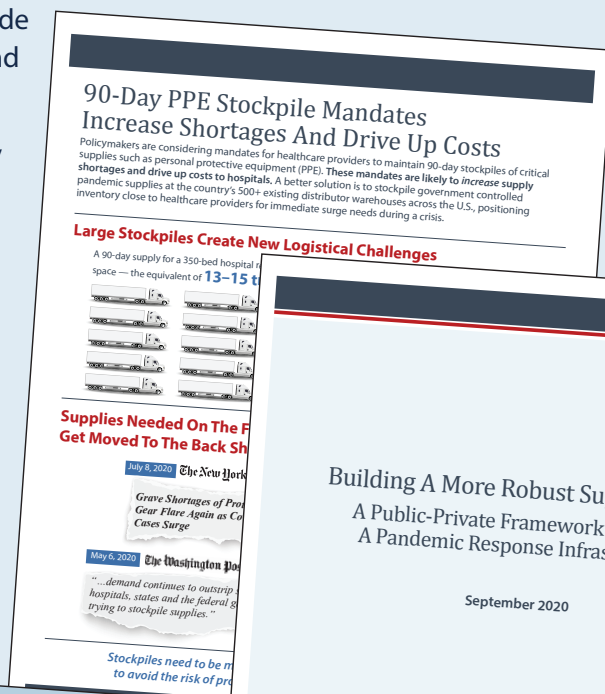
**The COVID-19 pandemic has led policymakers, media, and others to want to better understand the healthcare supply chain.**

HIDA has developed new resources to provide a high-level overview of the supply chain and the important role of distributors within it.

Resources include infographics, one-pagers, and slide presentations on issues including:

- The role of distribution
- Brokers vs. distributors
- PPE stockpiling
- Allocation

**Visit: [HIDA.org/UnderstandingHealthcareDistribution](https://www.hida.org/UnderstandingHealthcareDistribution)**



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