

# **Personal Protective Equipment Shortages during the COVID-19 Pandemic**

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# Introduction

- US facing a dire shortage of personal protective equipment (PPE) needed by health care workers fighting the coronavirus pandemic
- Nurses and doctors comparing themselves to firefighters putting out fires without water and soldiers going into combat with cardboard body armor
  - PPE shortages have dominated news cycle
- Endogeneity makes a PPE shortage a systemic public health problem, not just a worker's rights or occupational health issue
  - Sick healthcare workers increase demand for care and reduce quantity and quality of care

# Introduction

- Objective: investigate causal factors behind the shortages
- Main argument: problems from a structural issue were magnified by domestic and global shocks
- The structural issue: dysfunctional costing model in hospital operating systems
- Domestic shock: panicked marketplace behavior that depleted domestic PPE inventories
- Global shock: severe disruptions to the PPE global supply chain
- Adding fuel to fire: lack of appropriate action by federal government

# Background

- 2020 shortage in PPE is not unexpected nor is it without precedent
  - Previous shortages: HIV/AIDS mid-1980s; 9-11 attacks; 2014 Ebola virus
- Various stakeholders had warned of a pandemic, yet most governments still surprised and unprepared for COVID-19's high transmissibility and severity of symptoms
- US: Trump administration's policies – low PPE stockpiles, public health budget cuts, "streamlining" pandemic response team - weakened capacity of CDC to prepare for a crisis of this magnitude

# Structural Issue: Hospital Costing Model

- OSHA requires employers to provide employees with PPE free of charge.
- Other items used to treat patients (catheters, bed pans, medications) billed to the patient/insurer
- But PPE is a capital expenditure – a cost – for employers.
- Hospital managers adopt cost-effective behaviors by reducing capital expenditures in the short term to lower their costs.
- Hospitals do not have an economic incentive to encourage employees to use PPE, replace it frequently, or keep much of it in stock.

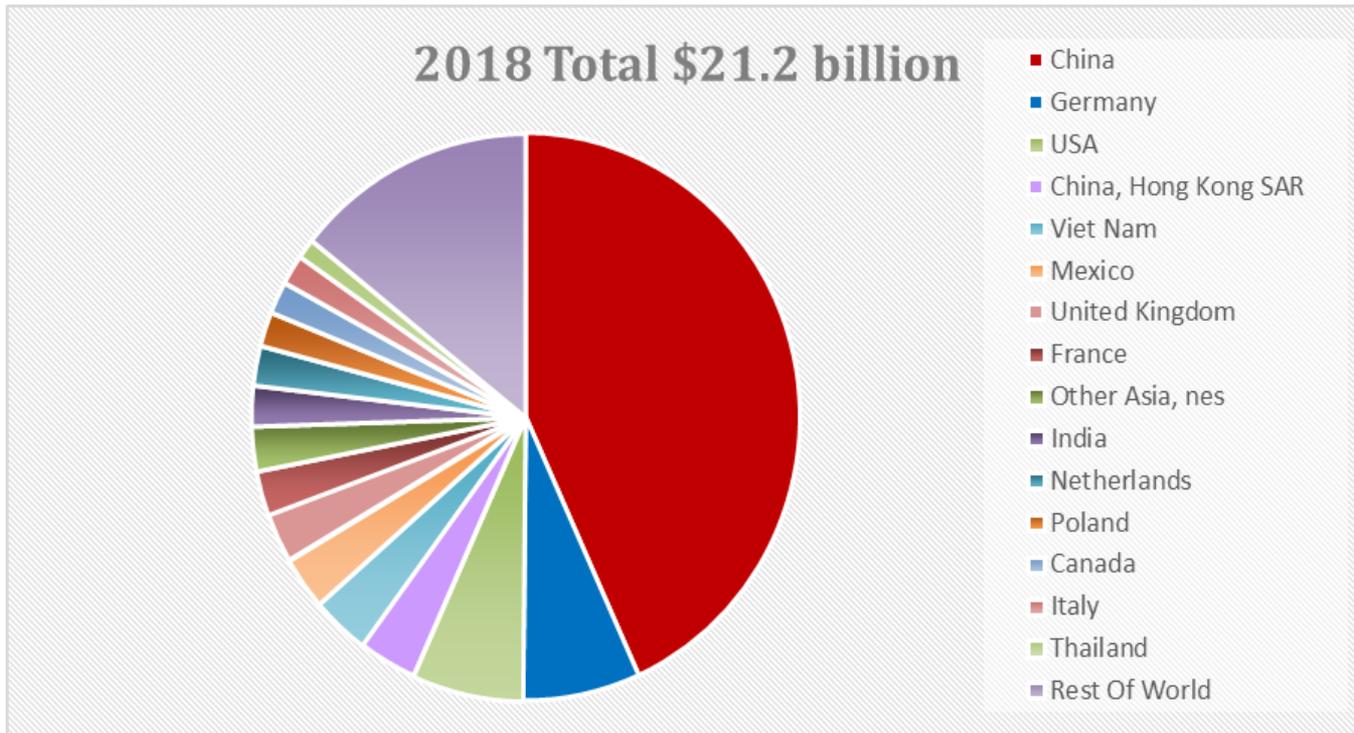
# Domestic Demand Shock

- Sheer scale of crisis and severity of the disease prompted a surge in panic buying and hoarding
  - Buyers who resold at extortionary prices
  - Worried consumers
- Contributed to a sudden and sharp reduction in American PPE inventories, which were already inadequate
- Result: mismatch between demand and supply
  - Can be viewed in an ability to pay framework
  - Market prices not good mechanism for rationing vital inputs to health like PPE
- Federal gov't unwilling to invoke the Defense Production Act to require private companies to manufacture PPE

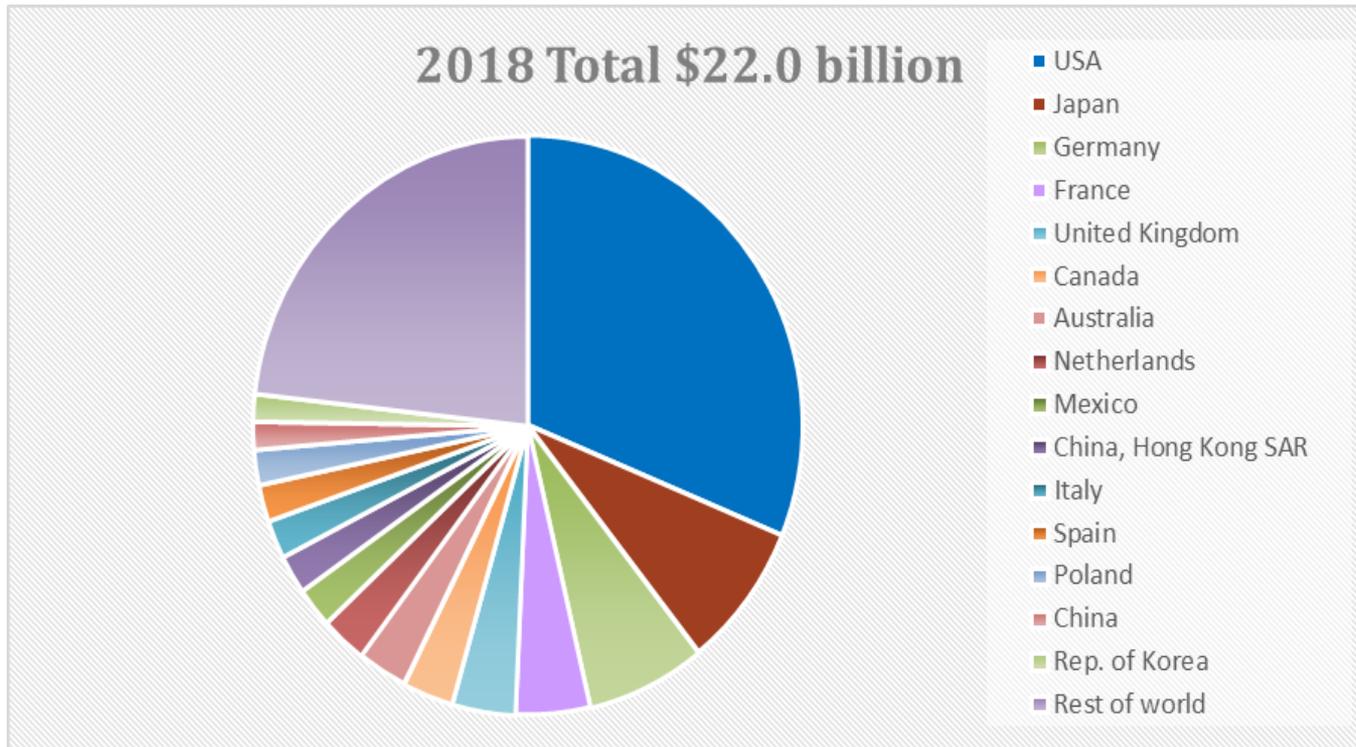
# Global Supply Chain Breakdown

- Incentive for hospitals to keep costs down not only kept inventories low, it has drove sourcing to low cost producers, especially China
- COVID-19 outbreak in China in late 2019 led to a surge in demand within China for PPE (especially for masks)
- China's government restricted its PPE exports and also purchased a large portion of the global supply
- Demand for PPE also increased in other countries and resulted in additional pressure on dwindling supplies.
  - Other global producers of PPE also restricted their exports

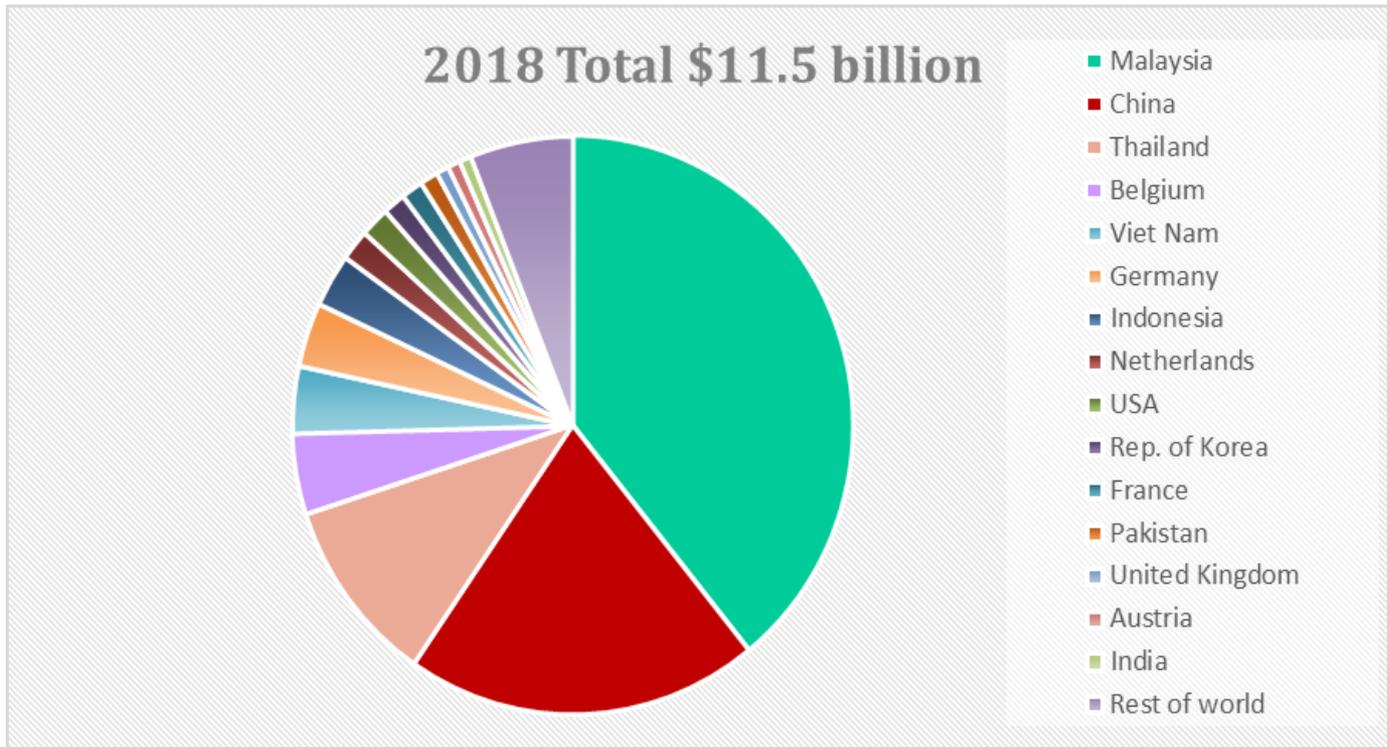
# China is the world's largest exporter of masks and protective eye gear



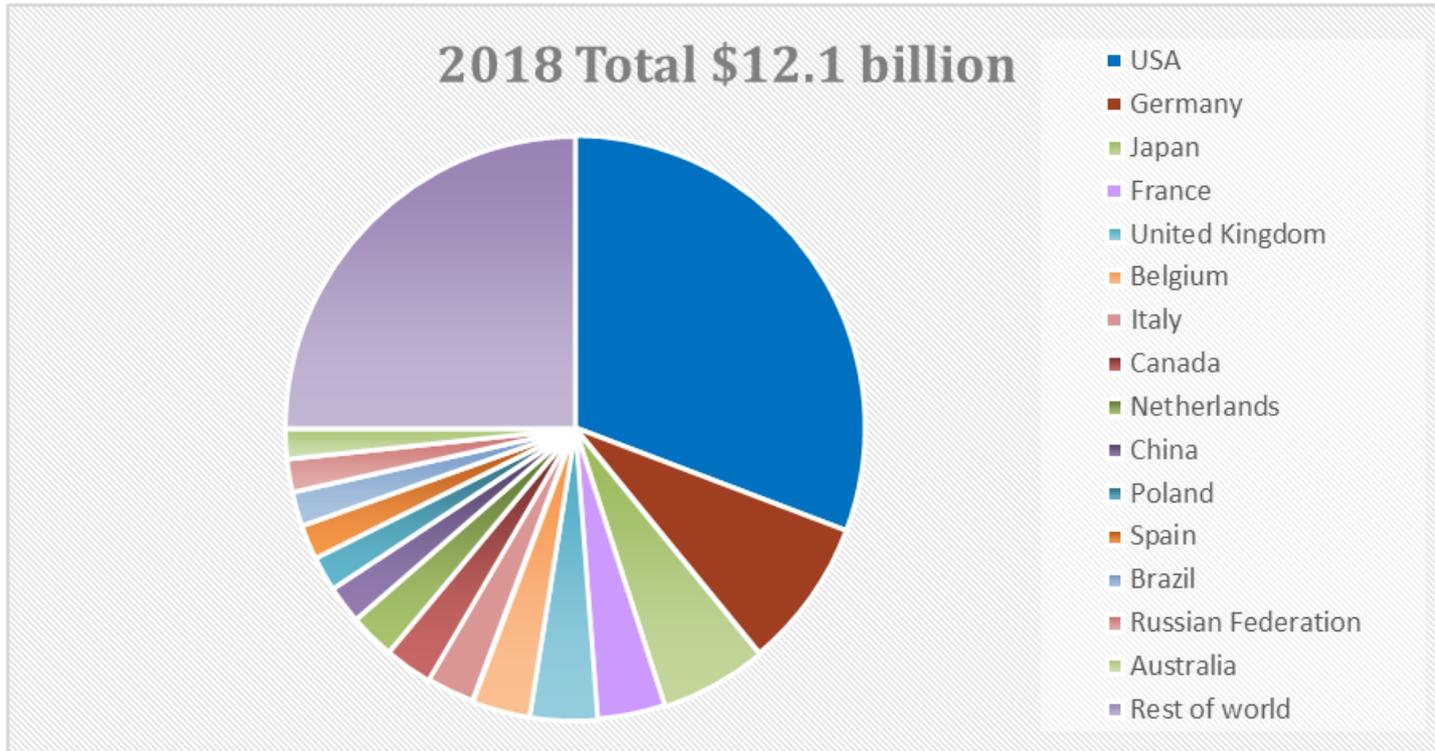
# The US is the world's largest importer of masks and protective eye gear



# China is the world's 2<sup>nd</sup> largest exporter of medical gloves



# The US is the world's largest importer of medical gloves



## Global Supply Chain Breakdown

- US is the biggest importer of PPE and so is highly dependent on the global supply chain
- With respect to exports, US failed to prioritize the country's public health needs
- After the COVID-19 outbreak, US was late to restrict PPE exports as other countries did
- US government failed to order millions of masks in the years leading up to COVID-19 crisis
- Trump administration's trade war with China (which included tariffs on medical products from China), contributed to higher prices and lower availability of PPE in the US market when the crisis hit.
- Mid-March 2020: administration announced it would lift some, not all, of the tariffs on PPE

## Global Supply Chain Conclusions

- In the case of PPE there is a market failure at the global scale
- Health care and other inputs to health (especially PPE) are intermediate goods that the market mechanism does not allocate in an optimal way
- When the desired outcome is a public good like health, market prices are poor directors of activity

## Summary and research needs

- Structural weakness in the US healthcare system laid the foundation for extreme shortages of PPE for health care practitioners during the COVID-19 outbreak
  - Hospital costing model means they have no incentive to keep large PPE inventories
- Problems with domestic demand and the global supply chain intensified the shortages
- Health is a public good, markets are not a good mechanism for rationing PPE
- More research needed on the gendered impact of PPE shortages
  - Also how gender diffs in bargaining power contributed to the shortages

## Policy recommendations

- Prepare hospitals to better protect their nurses and doctors by removing the profit motive around purchasing and maintaining inventories of PPE
- Improve enforcement of OSHA's current regulations around PPE and develop new regulations on workplace stress and fatigue
- Improve the government's ability to effectively distribute medical supplies
- Considering strategic industrial policy to increase US production of medical supplies and to reduce the dependence on the global supply chain for PPE