PETERSON INSTITUTE FOR INTERNATIONAL ECONOMICS

COVID-19 medical supply shortages and pandemic trade policy

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for

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Committee on Security of America's Medical Product Supply Chain

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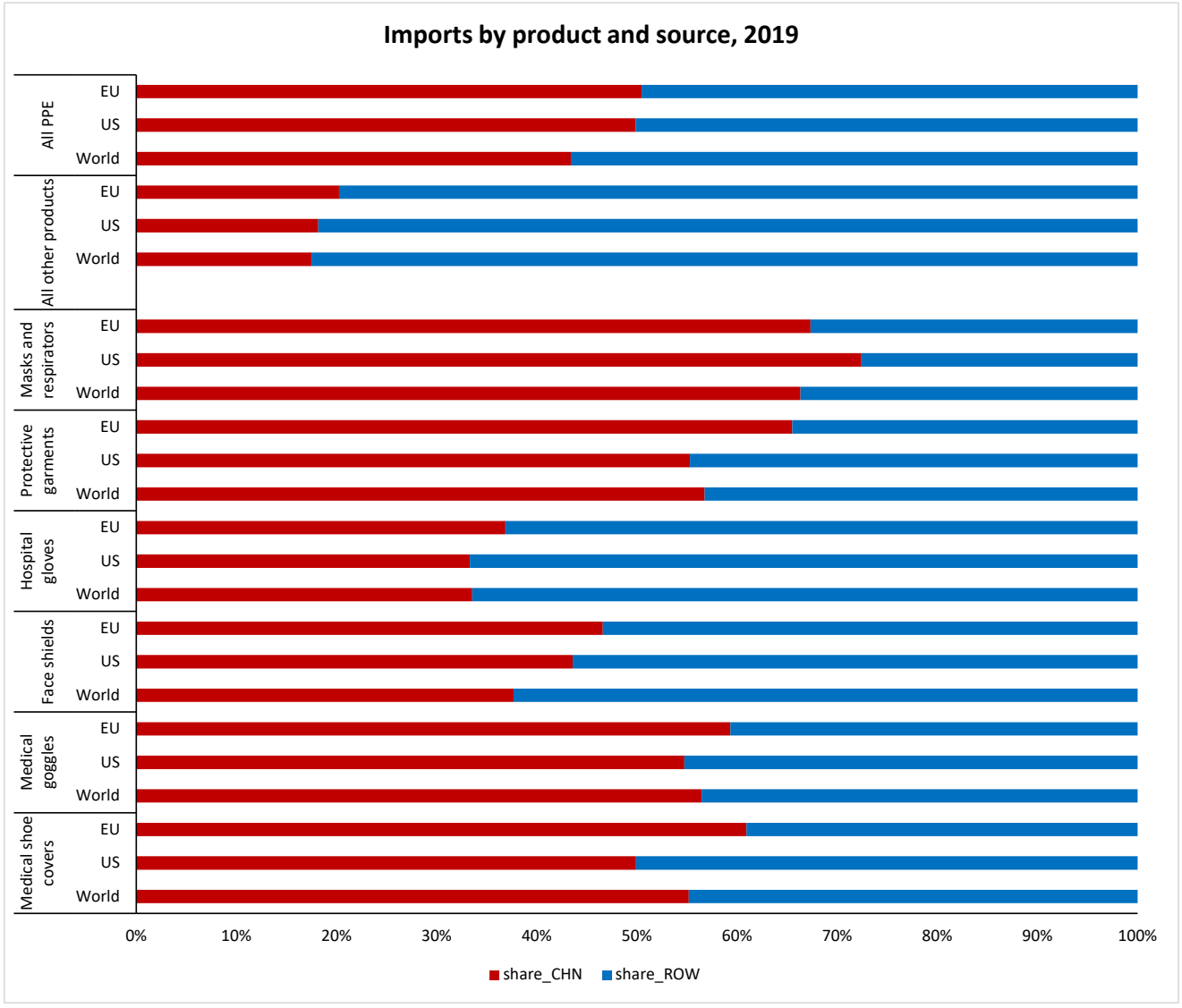
Pre-pandemic, for many forms of PPE:

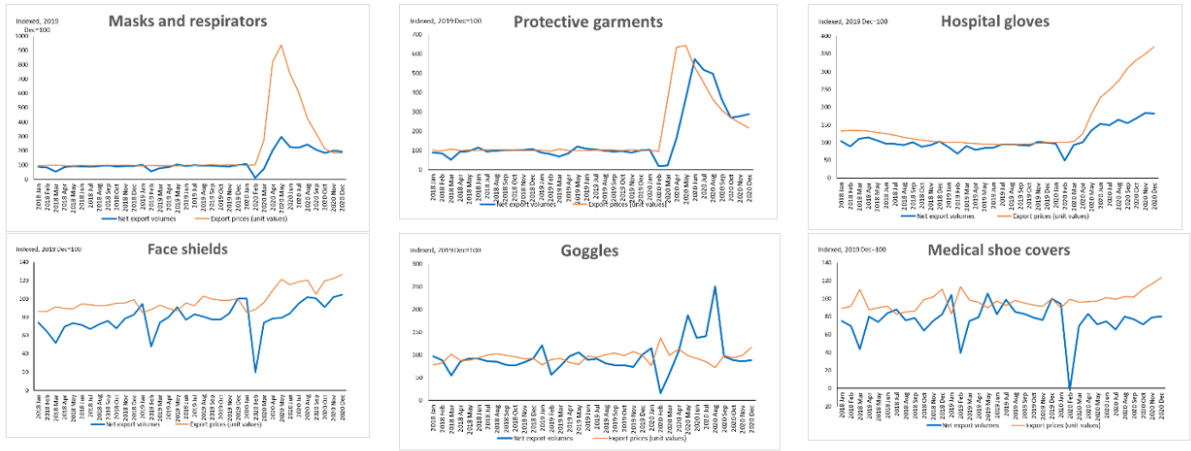
China was the primary foreign export source for the EU, US and rest of world



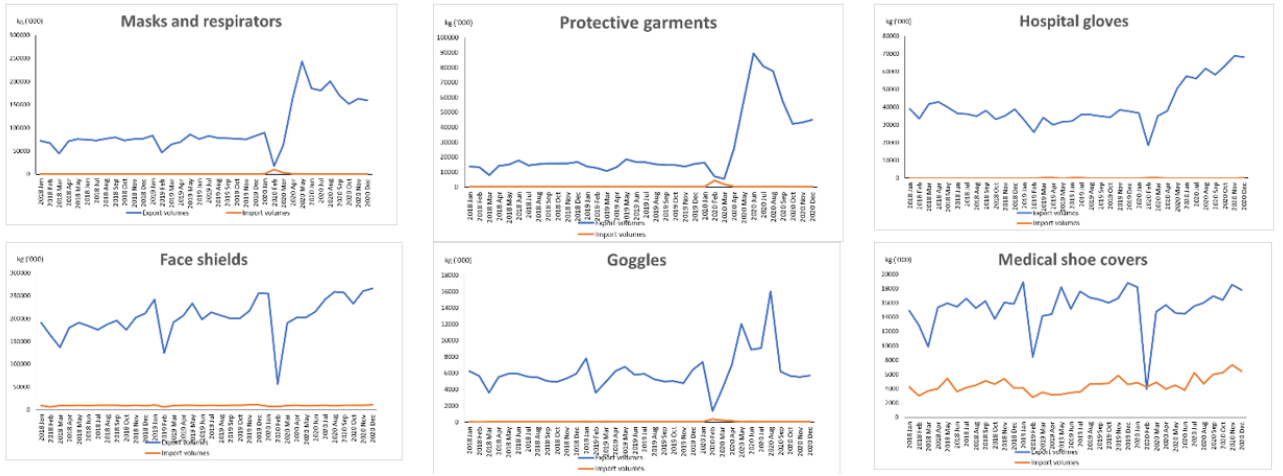
What happened to China's PPE trade over 2020?

Figure 2. China's 2020 PPE net exports fell off considerably in February and March before recovering with skyrocketing prices

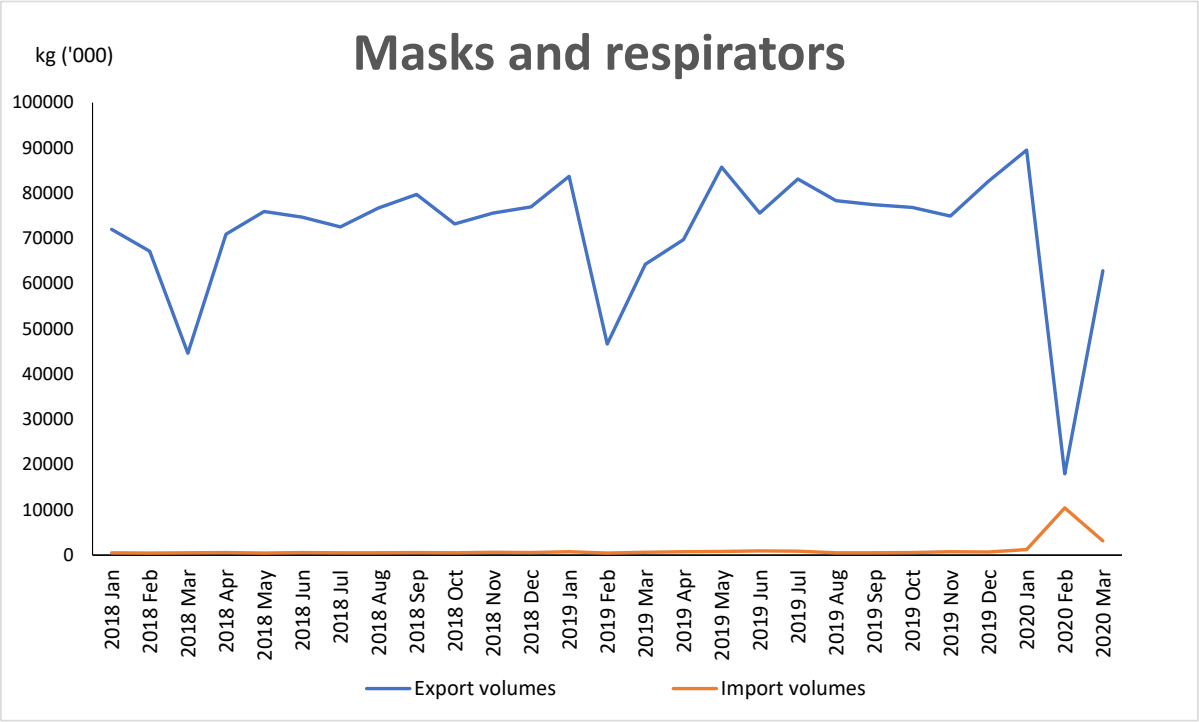
a. China's net export volumes and export prices (unit values), December 2019=100

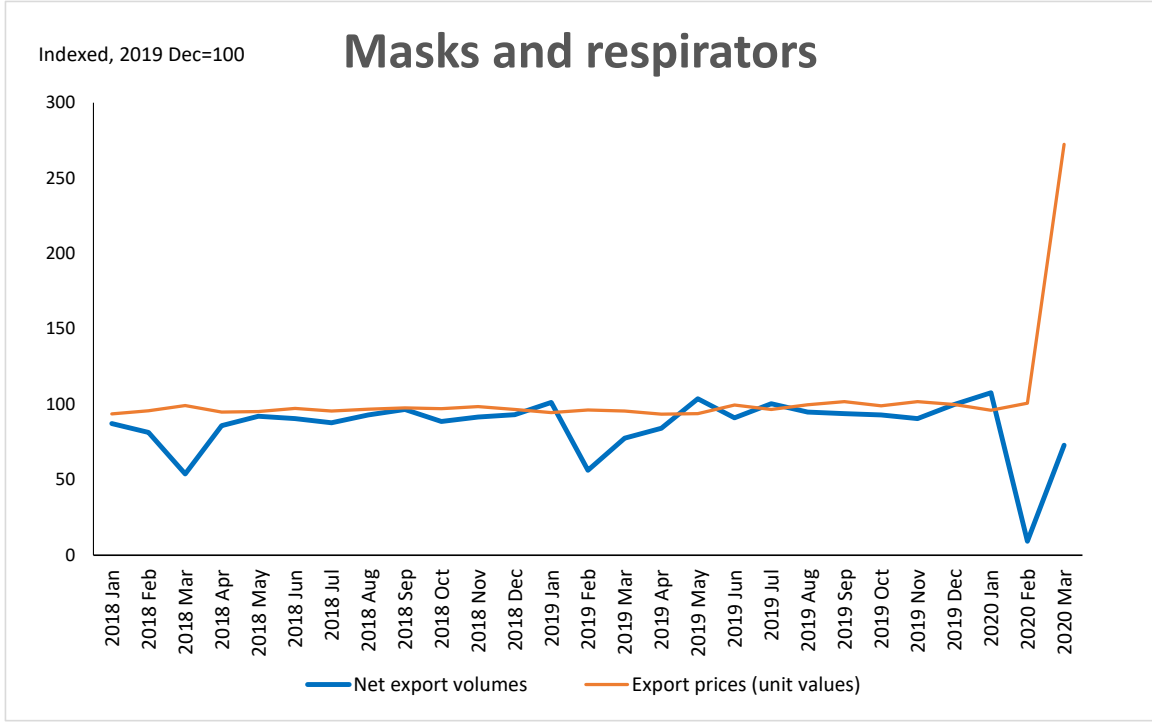


b. China's export volumes and import volumes, kg ('000)



COVID-19: What happened to China's PPE trade in early (Q1) 2020?

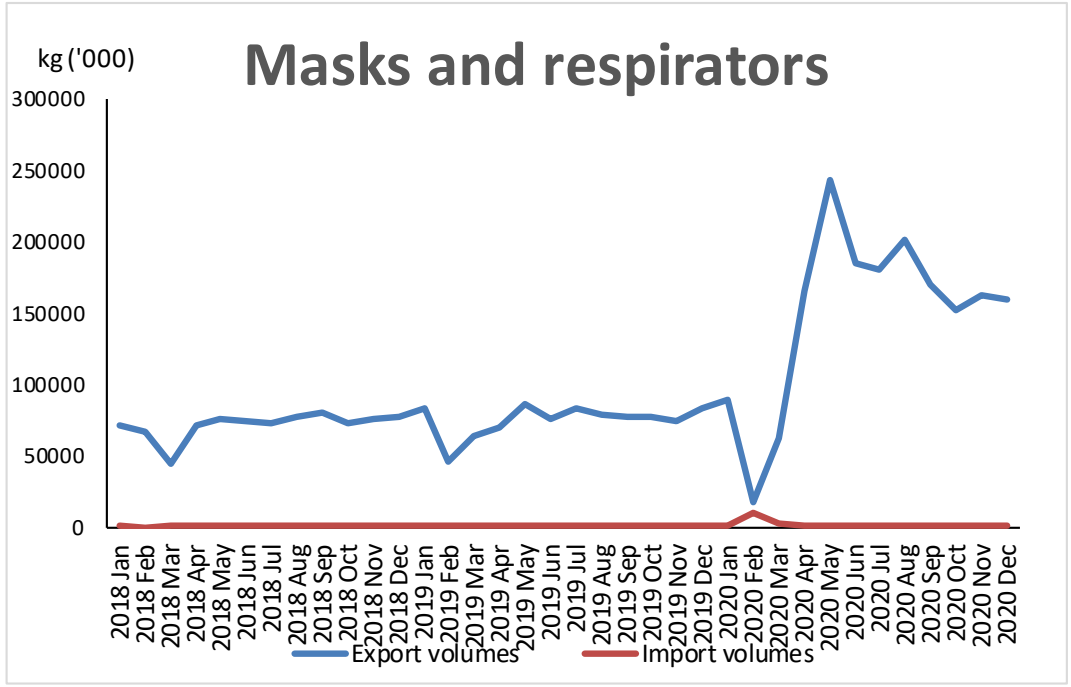


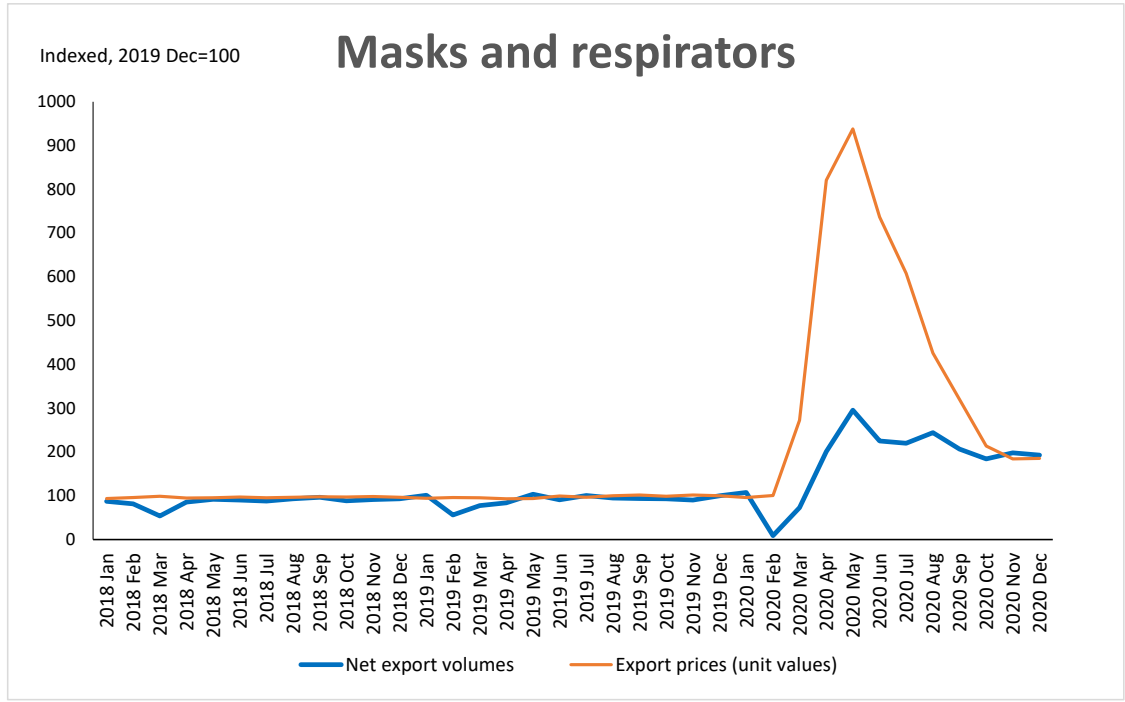


- ***Export volumes decreased***
- ***Import volumes increased***

- ***Net export volumes decreased***
- ***Export prices began to rise***

What happened to China's PPE trade over the entirety of 2020?





Starting April (Q2) 2020…

- ***Exports recovered***
- ***Imports fell off***

- ***Net exports recovered***
- ***Export prices spiked and remained elevated***

What happened to China's PPE exports in 2020?

Table 2. China's exports of PPE in 2019 and 2020, by product and destination

a. Trade values

Product	In 2019 (Billions, USD) Total	...to EU	...to US	In 2020 (Billions, USD) Total	...to EU	...to US
Masks and respirators	5.4	1.0	2.2	53.8	17.3	14.8
Protective garments	1.9	0.4	0.6	12.7	2.9	3.2
Hospital gloves	1.9	0.3	0.8	7.1	1.2	3.0
Face shields	13.3	2.1	3.5	16.8	2.4	4.4
Goggles	1.4	0.3	0.4	1.9	0.4	0.5
Medical shoe covers	0.9	0.1	0.2	1.0	0.1	0.2
Total	24.9	4.2	7.7	93.2	24.3	26.1

b. Trade volumes

Product	y-o-y % change in Jan-Mar 2020 (volume)* Total	...to EU	...to US	y-o-y % change in Apr-Dec 2020 (volume)* Total	...to EU	...to US	y-o-y % change in 2020 (volume)* Total	...to EU	...to US
Masks and respirators	-12.5	-11.4	-18.3	130.0	183.1	77.9	99.1	140.4	58.0
Protective garments	-22.1	-22.9	-30.6	271.7	179.4	184.4	210.0	138.3	137.6
Hospital gloves	-3.0	-15.5	-5.4	68.0	171.8	59.9	51.7	120.7	46.0
Face shields	-10.2	-19.3	-10.0	10.7	3.5	19.4	6.0	-2.4	12.6
Goggles	-22.0	-24.5	-15.0	48.7	33.5	58.4	31.6	18.9	38.1
Medical shoe covers	-10.9	-4.4	-10.7	-2.7	3.3	3.7	-4.5	1.7	0.7

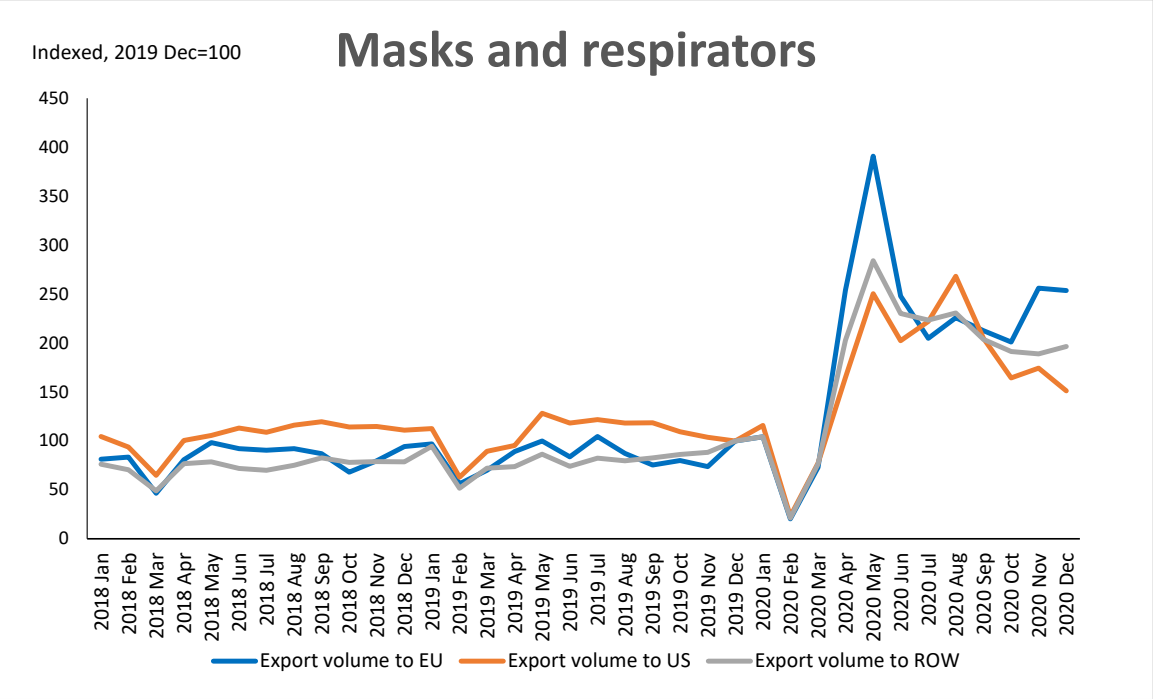
Note: Hubei and 'Protective garments'

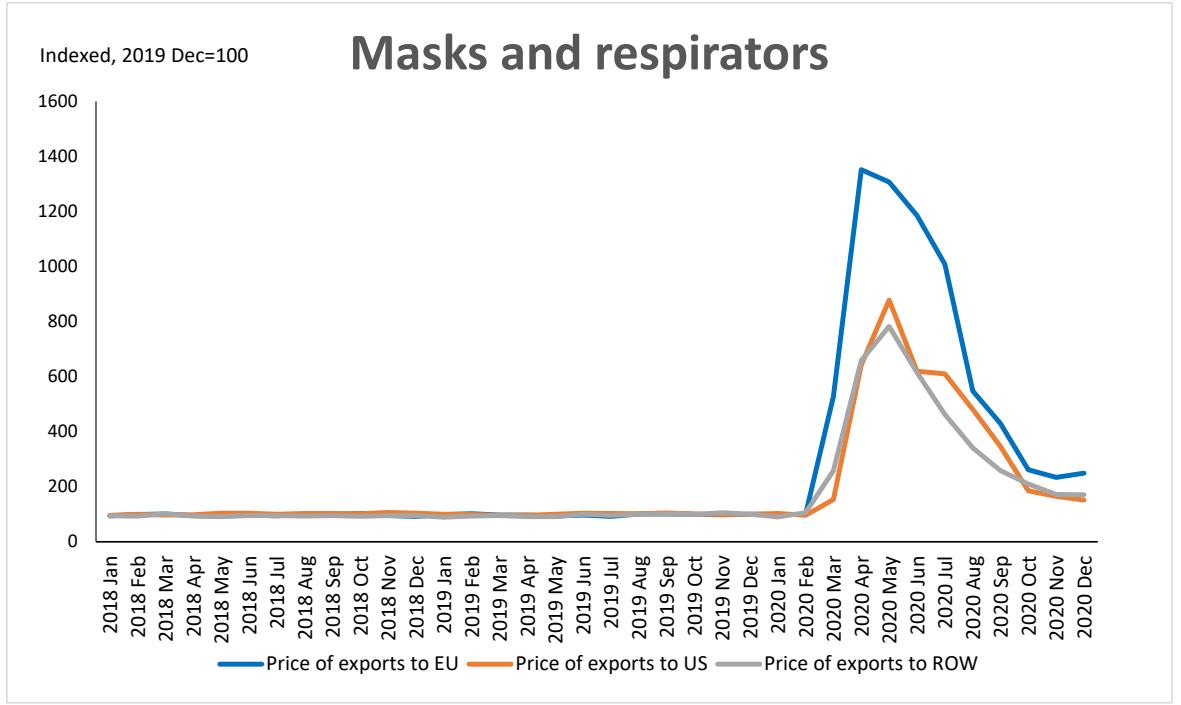
Example of perfect storm of shocks:

- ***Hubei was source of more than 1/3 of China's exports of protective garments in 2019***
- ***Hubei was source 75% of Chinese decline in exports of protective garments in Q1 2020***

What happened to China's PPE exports to US, EU, ROW in 2020?

Figure 3. China's PPE exports to the EU, US and rest of the world declined in February and March before recovering, and prices skyrocketed





Q1, 2020

- China's Exports to US fell

Beginning Q2, 2020

- China's exports to US recover
- China's export prices skyrocket

What happened to US imports of PPE in 2020?

Table 4. US imports of PPE in 2020, by product and source

a. Percent changes

Product	y-o-y % change in Jan-Mar 2020 (volume)*			y-o-y % change in Apr-Dec 2020 (volume)*		
	Total	...from China	...from ROW	Total	...from China	...from ROW
Masks and respirators (kg)	-15.7	-21.4	2.2	78.3	84.0	59.5
Protective garments (kg)	-8.0	-20.7	19.6	178.0	200.2	133.5
Hospital gloves (pairs, dozens)	-5.2	-3.4	-47.5	36.3	34.3	272.9
Face shields (number)	-6.5	-15.5	1.3	0.7	6.1	-4.3
Goggles (dozens)	-11.5	-16.9	-1.4	45.7	61.7	20.3
Medical shoe covers (kg)	-62.9	-70.0	-55.3	-14.5	-6.9	-21.9

Notes: Volumes rely on only the top HS08 code by value in 2020. % change are year-over-year for the relevant period.

b. Changes

Product	y-o-y change in Jan-Mar 2020 (volume, unit '000)*			y-o-y change in Apr-Dec 2020 (volume, unit '000)*		
	Total	...from China	...from ROW	Total	...from China	...from ROW
Masks and respirators (kg)	-20.0	-20.7	0.7	324.2	267.6	56.6
Protective garments (kg)	-2.4	-4.2	1.8	159.0	119.4	39.6
Hospital gloves (pairs, dozens)	-6.8	-4.3	-2.5	140.8	131.7	9.1
Face shields (number)	-402.3	-446.9	44.6	153.2	609.0	-455.8
Goggles (dozens)	-1.1	-1.0	0.0	11.1	9.2	1.9
Medical shoe covers (kg)	-0.2	-0.1	-0.1	-0.1	0.0	-0.1

Notes: Volumes rely on only the top HS08 code by value in 2020.

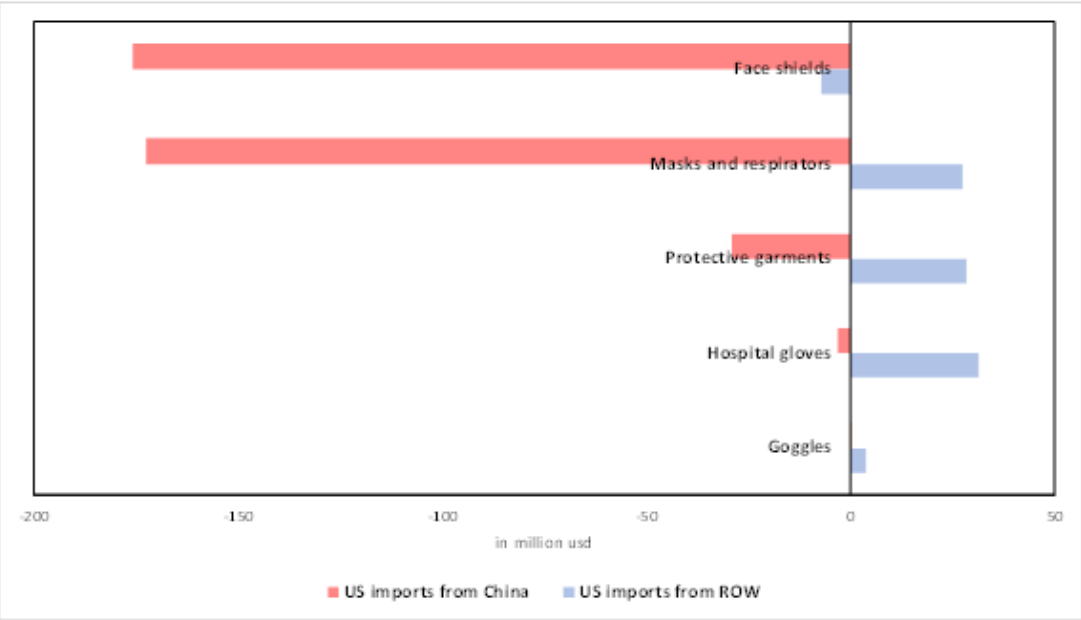
Notes:

- ***Q1: awful***
- ***Q2-Q4: amazing, life-saving, but…***

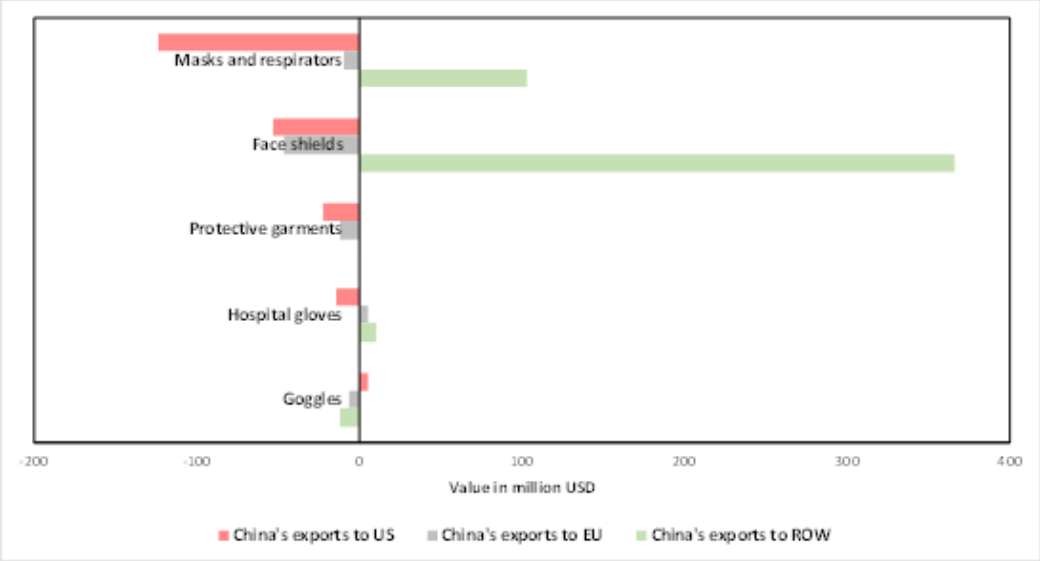
But the US had been imposing trade war tariffs on China before March 2020. Did those matter?

Figure 6. Did the trade war put the US at a preparedness disadvantage?

a. Year-over-year change in US PPE imports on List 4A from China and rest of world, October 2019 through February 2020



b. Year-over-year change in China's PPE exports on List 4A to US, EU and rest of world, October 2019 through February 2020



Implications: US Policy Changes (cont.)

Table 5. US investment subsidies for expanding PPE manufacturing supply chain in 2020

Date	Action
April 11	First DPA COVID-19 Title 3 project is $133 million to 3M ($76 million), O&M Halyard ($29 million) and Honeywell ($27.4 million) to expand production capacity of N95 masks by over 39 million units over next 90 days
May 6	DOD Awards $126 Million Contract to 3M, Increasing Production of N95 Masks
May 28	DOD awards $2.2 million contract with Hollingsworth & Vose to increase U.S. domestic production of 27.5 million N95 ventilator filters, and 3.1 million N95 respirators per month, starting in August.
June 22	DOD and US International Development Finance Corporation (DFC) sign MOU on DPA to utilize $100 million of DOD's funding under the CARES Act to finance projects to help re-shore production, including for PPE.[43]
June 19	DOD Awards $13.5 Million Contract to Lydall, Inc. to Increase Domestic Production of Meltblown Filtration Media, critical for N95 respirators and surgical masks
July 19	DOD Awards $3.5 Million Contract to Crosstex International, Inc. to Increase Domestic Production of Surgical Masks (support capital investments to procure additional machine lines through its longstanding partnership with its current domestic machine fabricator. The additional lines would increase Crosstex's production by an additional 100 million surgical masks a year.)
July 25	DOD Awards $2.75 Million Contract to NPS to install a new meltblown fiber line Increase Domestic Production of Meltblown Fiber
September 11	DOD Awards $136 million in contracts with five companies for COVID-19 Reusable Isolation Gowns, also used for the replenishment of Strategic National Stockpile
September 14	DOD Awards Contracts to nine American businesses for the delivery of 73 million COVID-19 disposable isolation gowns at a cost of $335M, also used for the replenishment of Strategic National Stockpile
November 10	DOD contract for $37 million to 3M for production capacity expansion for N95 respirators
November 13	DOD Awards $6.18 Million Contract to Medline Industries, Inc. to Increase Domestic Production Capacity of Surgical Masks
November 20	DOD awarded a $565,000 contract to Freeman Manufacturing Co. to increase domestic production capability of disposable gowns.
December 2	DOD awarded a $2.5 million contract to Hollingsworth & Vose, to increase domestic production capability of filter media

Source: Constructed by the author.

Open questions for future policy on pandemic preparedness

US PPE production. *We need data.*

- How much PPE production capacity existed at US manufacturing facilities **prior to** the pandemic?
- How much were US facilities able to add, and on what time schedule in 2020?
- With more or different financial resources, could they have done more? Could they have done what they did **more quickly?**
- Were access to inputs a constraint?
- Why did US government move so slowly on subsidies? What information would they need to move more quickly?

Optimal "Strategic National Stockpile" – but how big?

- Depends on how quickly supply can expand
  1. How quickly can imports increase? (different scenarios)
  2. How quickly can domestic production increase?
- Maintaining some surge capacity – what policy tradeoffs to do so?
  - Relative costs of subsidies vs import tariffs

References

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