



# **China's presence in NHS supply chains:** Why we need to protect our health service from future threat

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## Summary

This paper introduces the issue of Chinese-manufactured goods in NHS supply chains, asking what risks this may create and what steps the UK Government might take to address these.

The specific aims are:

- To assess overall Chinese presence in NHS imports;
- To assess the trend since the start of the Covid-19 pandemic; and
- To assess these in the areas of:
  - personal protective equipment (PPE);
  - testing and diagnostic; and
  - medical devices and equipment.

Supply chains have been severely affected by the pandemic and ensuing lockdowns. Russia's invasion of Ukraine has made this worse. Surveys suggest that more companies are considering moving their manufacturing from China, as awareness of risks grows, especially for medical supply chains.

Indian government officials increasingly describe their medical supply chain dependence on China as a 'threat', including to its military; Chinese state media has discussed withholding medicine from the United States: a former White House trade advisor has suggested that 'no matter how many treaties you have... when push comes to shove you run the risk [of] not having what you need'. The US Congressional Research Service claims: 'the Chinese government may selectively release some medical supplies for overseas delivery... according to political calculations'. Beijing already appears to have prioritised countries for medical supplies through the Covid pandemic, as western policy-makers begin to consider the question of political leverage and medical supply chains.

In the US, the Coronavirus Aid, Relief, and Economic Security (CARES) Act included studies of pharmaceutical supply chain security. The US State Department is working with other governments to move supply chains from China, with a flurry of other legislation on foreign influence in medical supply chains. Drug manufacturers will be asked to report drugs that are 'vulnerable to supply chain risks that could lead to shortages'; the federal government will report on China's regulatory practices for pharmaceutical and PPE manufacturing; domestic investment tax credits are planned, and firms will need to report medical ingredients' sources. Other countries' emerging strategies combine 're-shoring' and 'reglobalisation' away from Chinese control. Japan aims to re-shore some production of products where it is 'highly dependent on a single country'.

A proposed schema of the risks of China's presence in health supply chains is as follows:

- First, potential 'chokehold' risks through control of supplies;
- Second, potential access to sensitive data; and
- Third, general geopolitical risk, such as via mercantilist policies. The Chinese Communist Party's (CCP) economic neo-mercantilism is structured around the centralised government which controls all capital movements, discourages imports whilst encouraging exports, from which Beijing has built up enormous foreign

reserves, giving the Chinese government significant global monetary and fiscal power. This power is often used by the CCP to exert geopolitical leverage on other states.

In the UK, in personal protective equipment (PPE), the percentage of imports from China rose from 35% in 2015 to 60% in 2020, before returning to a pre-pandemic level of 30% in 2021; in the category of testing and diagnostic, from 2% in 2015 to 37% in 2021; in the category of medical devices and equipment, from 9% in 2015 to 14% in 2021.

But these products are merely a sample: more research is needed, especially on Active Pharmaceutical Ingredients (APIs) manufactured in China for medicines made elsewhere. The UK's reduced reliance on China in PPE is partly due to the Government's PPE strategy. This shows how targeted action can succeed.

The Prime Minister has said that 'Project Defend' will aim to 'end reliance on Chinese imports' including in 'vital medical supplies'. Officials are asked to identify vulnerabilities which necessitate 'repatriation' of manufacturing for 'essential supplies'. As a US Congress report proposes 'collaboration with like-minded countries' to 'diversify away from China', highlighting the UK as a desired first partner, US researchers suggest reforms such as having one 'Point of Accountability' in government and a National Health Security Strategy that strengthens the industrial base for medical supplies.

In the UK, Government might now study emerging programmes especially in the US, Japan and Taiwan that combine **re-shoring and 'ally-shoring' medical manufacturing** and outline **priorities for medical supplies**, including in 'testing and diagnostic' and 'medical devices and equipment', as well as medicines and their ingredients.

Just as the Telecommunications (Security) Act 2021 aims to secure electronic communications networks, a **National Health Service (Security) Act** could secure medical supply chains. Areas within this type of Act could include a **review of how to reduce risks of over-reliance on China for essential medical products**, with a complete picture of reliance on China for medical products, devices, and medicines.

This may include a **role for tax credits, preferably ahead of subsidies, to 're-shore' or 'ally-shore'** crucial manufacturing. Government could also study calls for 'Quad'-oriented medical supply chains and the **Supply Chain Resilience Initiative (SCRI)** launched by India, Japan and Australia to reduce dependence on China and report on the impact of China's **mercantile economic practices** and **emerging export preferences** on medical supply chains, as well as the health security implications of China's **medical ingredient supplies**.

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## 1. Introduction

### Purposes of the paper

This paper introduces the issue of goods manufactured in the People's Republic of China (PRC) in National Health Service (NHS) supply chains. It aims to understand the extent to which the NHS has come to depend on China for imports of medicines and other supplies, and the broad trend of this dependence since the beginning of the Covid-19 pandemic. It also aims to consider what level of dependence in this sector might constitute a dangerous ill-advised dependency; the types of risk this may create; and what steps the UK Government might take to begin to address such risks. While the paper does not aim to assess *total* dependency, which is mitigated by domestic production, it can assess the extent to which dependency on China has developed among UK *imports*.

The specific aims are therefore as follows:

- To assess overall Chinese presence in NHS imports;
- To assess trends in the Chinese presence in NHS imports since the beginning of the Covid-19 pandemic; and
- To assess these in the specific areas of:
  - personal protective equipment (PPE);
  - testing and diagnostic; and
  - medical devices and equipment.

### Data sources

Our assessment will focus on the c.200 items on the so-called 'disaster relief list'. As we will discuss in the data analysis, despite its name, this list is relatively broad, covering the categories of: medicines; testing and diagnostic; medical devices and equipment; PPE and other protective equipment; disinfectants/sterilisation products; medical consumables; and cleaning equipment. This means the goods on the list cover a reasonably representative range of areas.

The data we use is drawn from the Combined Nomenclature system of product categorisation (CN). When we refer to Chinese goods, this should be taken to mean any product registered as coming from China, whether manufactured by PRC-owned companies or others.

### Analysis and a schema of levels of risk

#### General analysis

Our discussion of results covers the current positions and Covid-19 pandemic trends in the level of UK dependence, including overall dependence among the c.200 items on the 'disaster relief list' – as well as discussing specific products within it – and dependence in the areas of personal protective equipment (PPE); testing; and medicines, medical equipment and supplies.

## A schema of levels of risk

The paper will propose a 'schema' of risk, designed to help assess where the presence of Chinese goods in the NHS supply chain creates risk to the United Kingdom. It should also be understood that these supplies by Chinese firms exist in the context of China's 'civil-military fusion' strategy (whereby Chinese civilian companies are increasingly obliged to share skills, trade secrets and other knowledge with China's military-related companies and other entities) and within a mercantilist policy framework whereby the Chinese state uses subsidies and other supports to give Chinese companies advantages in the international marketplace, potentially undercutting foreign competitors and reducing the efficient allocation of resources. In the round, this is liable to be detrimental to innovation and prosperity internationally.

The proposed types of risk created by China's presence in health supply chains are as follows:

- First, so-called '**chokehold**' risks. For example, if control over energy supplies could give the government of the PRC leverage through the theoretical ability to 'switch off the lights', does an equivalent theoretical capacity to 'switch off our medicines' exist? This might affect UK national security and the capacity to respond to pandemics like Covid-19 in the future;
- Second, there is the question of whether supplying a product leads to **potential access** to sensitive data, UK citizens' data (potentially including genetic data), and to any risk of invasion of privacy; and
- Third, the current **geopolitical context** itself may create another degree of risk of its own: this includes China's 'military-civil fusion' strategy (the integration of military and civilian industry and technology intended to give the People's Liberation Army (PLA) a leading edge in adapting emerging technologies), and potentially military-linked companies and shareholders who may supply the UK and China's mercantilist policies generally. This includes the 'Made in China 2025' programme and the effect of Chinese state funding in driving out foreign competitors from global markets.

In each of these categories, the degree of risk should be balanced against the considerations of: first, whether sourcing the product from a non-PRC supplier could be more hazardous; and second, whether the Chinese presence in the NHS supply chain would be genuinely difficult to change (e.g. if China supplies 90% of a country's antibiotics, this apparent risk may still be reduced if new supplies could be sourced with ease in an emergency). We will discuss the degree to which these different types of risk may apply to different areas.

## Chapter outline

Following the *Introduction*, the *Political background and the current environment* outlines how other countries are beginning to approach these risks; the *Data analysis* chapter will outline the dataset, including the c.200 product categories, trends, and the specific areas of personal protective equipment (PPE); testing; and medicines (i.e. pharmaceuticals), medical equipment and supplies.

The *Conclusions and discussions* will also consider the extent to which the UK Government may need to reduce NHS supply chain-dependency on imports from the People's Republic of China (PRC), while considering the measures other countries are beginning to employ.



## 2. Political background and the current environment

Supply chains in general have been severely affected by the Covid-19 pandemic, its ensuing lockdowns and resulting bottlenecks.<sup>1</sup> Inflation has reared its head in the British economy. In China, Covid infection rates are once more leading to lockdowns, imposed without warning in Shenzhen and the entire province of Jilin, which are set to restrict shipping. Russia's invasion of Ukraine has worsened supply chain risk generally: Ukraine is a major exporter of iron, industrial gases, and wheat, for instance.<sup>2</sup> While high-tech sectors have been seen as most at risk from these disruptions,<sup>3</sup> the crucial nature of medical supplies especially means that public awareness of the associated risks is growing.

State and commercial supply chain risks are interrelated, with Government influenced by emerging commercial mitigation strategies. Since the 1990s, but especially after China's World Trade Organisation membership of 2001, western firms began outsourcing production, moving supply chains – or crucial parts of them – to China, but this 'exposed companies to a plethora of supply chain risks'.<sup>4</sup> Awareness of this is one of the factors that has led to the apparent slowing of globalisation – or 'slowbalisation' – with global trade as percentage of GDP shrinking, lately accelerated by the Covid-19 pandemic and lockdowns, revealing even greater supply chain risks.<sup>5</sup>

Businesses' perceptions of the wisdom or otherwise of sourcing from or manufacturing in China are changing. A November 2020 survey by the American Chamber of Commerce in Shanghai (AmCham)<sup>6</sup> found that 71 percent of manufacturer respondents said 'they will not shift production out of China', claiming this showed that foreign '[c]ompanies remain committed to the China market'. The same year, however, a Bank of America survey<sup>7</sup> found that '[c]ompanies in two-thirds of global sectors in North America have either implemented or announced plans to pull at least a portion of their supply chains out of China, while companies in 50 percent of country-sectors in the Asia Pacific (ex-China) region [were] doing likewise.'<sup>8</sup> Analysts have also pointed out that the AmCham survey relies mainly on firms that are 'in China for China', i.e. manufacturing for Chinese consumers, and that it was carried out before the US ban on Xinjiang cotton due to forced labour concerns.<sup>9</sup>

The emerging commercial diversification of supply chains away from China is also being driven by other risks increasingly associated with the country, including:<sup>10</sup> trade conflicts and tariffs; intellectual property risks; rising wages compared to other developing countries;

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<sup>1</sup> Danziger, 2022

<sup>2</sup> Ibid

<sup>3</sup> Ibid

<sup>4</sup> Iakovou and White, 2020

<sup>5</sup> Ibid

<sup>6</sup> Of 346 of its members. In Brandao, 2021

<sup>7</sup> Of 'equity analysts covering more than 3,000 companies globally'. In ibid

<sup>8</sup> Ibid

<sup>9</sup> Ibid

<sup>10</sup> Kapadia, 2021

forced labour and emerging sanctions (so far focused on Xinjiang cotton); and climate risks and coal-burning (although some of these risks affect other locations to varying degrees).

A growing awareness of China's mercantilist strategy is also having an effect on governments' approaches to China and supply chains, especially since the 2015 release of Beijing's 'Made in China 2025' ten-year plan to develop China's manufacturing industries, whose target sectors include 'synthetic materials' and 'bio-medicine'. Chinese policy-makers have become less open with western counterparts about what the initiative involves, but its features are known to include: the provision of direct subsidies (through direct state funding, low interest loans, tax breaks and other subsidies, estimated in the hundreds of billions of dollars), and the mobilisation of State-owned Enterprises (SOE) and state-supported private firms like Huawei. A 2018 report from the White House described how China's approach threatens 'not only the U.S. economy but also the global innovation system as a whole.'<sup>11</sup>

Governments' understanding of associated supply-chain risk is also changing. The US Congress has raised the alarm over China's effective February 2020 'nationalisation' – or arguably centralisation – of the production and dissemination of medical supplies,<sup>12</sup> transferring authority from the Ministry of Information Industry and Technology (MIIT) to the National Development and Reform Commission (NDRC), the central planning agency, which 'commandeered medical manufacturing and logistics down to the factory level and directed the production and distribution of all medical-related production, including U.S. companies' production lines in China for domestic use', efforts which were 'understandable as part of its efforts to address an internal health crisis' but which may have denied foreign countries critical medical supplies. China's Ministry of Commerce (MOFCOM) also told its offices in China and abroad to prioritise securing supplies for import, using a list of 51 medical suppliers and distributors in 14 countries. This helped lead to sharp increases in essential PPE and medical supply imports and a fall in critical medical product exports to other countries.<sup>13</sup>

Other medical supply chain risks have become the subject of public debate in the US and India, for example. The US and others are dependent on China for penicillin and other vital drugs: the last American penicillin fermentation plant, in Syracuse, New York, announced closure in 2004 due in large part to apparent Chinese dumping of penicillin ingredients the same year (this also forced the closure of fermentation plants in Europe and India). Four years later, after China had gained a chokehold on global supply, Chinese producers increased prices dramatically. US researchers have proposed that a 'smart strategy', possibly coordinated with allies, is now required in response to such risks.<sup>14</sup>

Vitamin C shows a similar pattern, with supplies – and prices – now largely under Chinese control. In a recent US anti-trust case, the Chinese Ministry of Commerce itself filed a court

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<sup>11</sup> McBride and Chatzky, 2019

<sup>12</sup> Sutter, Schwarzenberg and Sutherland, 2021

<sup>13</sup> Ibid

<sup>14</sup> Gibson, 2019, at Committee on Energy and Commerce Subcommittee on Health: Safeguarding Pharmaceutical Supply Chains in a Global Economy, October 30, 2019

brief in defence of Chinese firms that appear to have created a cartel, driving other producers out of business.<sup>15</sup>

In generic medicines,<sup>16</sup> India itself is considerably dependent on China for the necessary raw materials and chemical intermediates,<sup>17</sup> a dependence ‘recognized by senior Indian government officials as a national security threat to that nation, its military, and its large generic drug industry which would shut down within weeks without Chinese [ingredients].’ In fact, India has asked Beijing to ensure that prices for medical supplies remain stable, following surging costs for Covid-related products. India’s Consul General in Hong Kong has asked China to facilitate special cargo flights following a suspension of flights to India by state-owned Sichuan Airlines Logistics: the Pharmaceuticals Export Promotion Council of India warned of the risk of a ‘cascade effect’ on supply chains.<sup>18</sup>

There has also been speculation in the Indian press about possible Indian military dependency on China for medical supplies, regarded as an unacceptable level of leverage.<sup>19</sup> This has led others to ask how the UK might be involved in any ‘Quad’-oriented medical supply chain security strategy, and might study the international ramifications of China’s medical ingredient supplies, including full quality assessments.<sup>20</sup>

That Chinese state media has discussed withholding medicine from the United States should surely also be considered an indication of risk. As a US researcher has warned, ‘If you withhold medicine, you’re basically threatening to kill... If that is not a warning, I don’t know what is’. Former White House trade adviser Peter Navarro has suggested that:

‘What we’re learning from that is that no matter how many treaties you have, no matter how many alliances, no matter how many phone calls, when push comes to shove you run the risk, as a nation, of not having what you need’.<sup>21</sup>

While the potential ‘weaponisation’ of medicines or ingredients by China has been raised (for example, ‘medicines can be made with lethal contaminants or sold without any real medicine in them, rendering them ineffective. These products can be distributed to specific targets’<sup>22</sup>), this is regarded as less of a serious possibility than Beijing simply becoming selective about whom China supplies. The Congressional Research Service has also warned that: ‘the Chinese government may selectively release some medical supplies for overseas delivery, with designated countries selected, according to political calculations.’<sup>23</sup>

While medicinal supplies to national militaries could be called the ‘sharp end’ of these risks, government studies of defence supply chain risk appear to have generally focused on

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<sup>15</sup> Ibid

<sup>16</sup> According to the Association of Accessible Medicines, India is the source of 24.5 percent of generic drugs sold in the US. In *ibid*

<sup>17</sup> Ibid

<sup>18</sup> Krishnan, 2021

<sup>19</sup> Gibson, 2019

<sup>20</sup> Ibid

<sup>21</sup> In Gibson, 2019 and Beavers, 2020

<sup>22</sup> In testimony to the U.S.-China Economic and Security Review Commission. Gibson, 2019

<sup>23</sup> Serhan and Gilsinan, 2020.

defence equipment specifically, and less on other supply chains such as medicines. A 2018 US Department of Defense report, 'Assessing and Strengthening the Manufacturing and Industrial Base and Supply Chain Resiliency of the United States' found that most counterfeit electronics came from China, with successful US Justice Department prosecutions in 2019 for Chinese-made cameras and surveillance equipment on US military installations. Yet if the impact of supply chains on the ability of western countries to manufacture weapons and avoid intrusion in possible future conflicts is worth assessing, it should also be worth considering other areas of leverage that China-controlled supplies could create.<sup>24</sup>

### **Project Defend**

In response to growing calls for the need to diversify away from Chinese reliance on certain imports (particularly PPE and other health-related products) in the wake of the COVID-19 pandemic, HMG announced plans to diversify the UK's imports of critical goods, including pharmaceuticals and PPE, in order to end the country's reliance on supply from China.

In May 2020 the Prime Minister instructed civil servants to draw up plans for 'Project Defend' – the strategy for protecting national security after the pandemic.

The approach was to identify key economic vulnerabilities, in addition to potentially hostile governments, with the aim of ensuring critical supply lines are no longer dependant on individual countries.

The PM also stated that he would seek to protect Britain's technology industry as part of the review.

The announcement from the PM came after then-Foreign Secretary, Dominic Raab, said in April that there will be no return to 'business as usual' with China after the pandemic.

So far, two years later, there have been no updates to how Project Defend has executed its mandate, any conclusions, or any policy implementations. Lord Alton of Liverpool (Labour) submitted a question to HMG Department of International Trade in April 2022, requesting an update to any progress made, how it has contributed to increasing national resilience, and contributed to reducing supply chain dependency on the PRC. At the time of publication an update has not been provided.

### **Political developments in other countries**

In the US, political life has seen growing demands for improved supply chain security for at least the last five years. These have grown since the Covid-19 pandemic, and especially since American companies have become seen as 'reluctant to make long term investments in domestic PPE production because of the uncertainty in future market conditions', despite 'the ability to supply our own PPE [being] an issue of national security. Just as we don't rely on China to supply military uniforms we must not rely on them to supply our PPE.'<sup>25</sup>

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<sup>24</sup> Hanson, 2021

<sup>25</sup> Senator Lindsey Graham, in Fredericks, 2020.

According to Senator Lindsey Graham, ‘Coronavirus has been a painful wakeup call that we are too reliant on nations like China for critical medical supplies.’<sup>26</sup>

According to Galbraith (2021), the shift in US opinion can be seen in the difference between the January 2013 Obama White House White Paper ‘National Strategy for Global Supply Chain Security: Implementation Update’ (merely 22-pages long and focused on threats to transport, like terrorism), and the June 2021 Biden White House 100-day review, ‘Building Resilient Supply Chains, Revitalizing American Manufacturing and Fostering Broad-based Growth’, focusing on a broad range of security issues in four fields: semiconductors, high-capacity batteries, critical minerals, and pharmaceuticals. In the pharmaceutical field, the challenge is not seen as scarcity, but of ‘basic economics’, as supply chains moved to places like India for cost reasons. This implies that supply chain resilience would mean ‘maintaining a “virtual” stockpile, consisting of manufacturing equipment and precursor chemicals, to be held in reserve in case of emergencies.’ However this review ‘is realistic about the prospects: the scale and complexity of the sector, together with the unpredictability of future biological threats, makes it impractical to maintain large reserves in all areas.’<sup>27</sup>

In the last three years, Republican and Democrat senators have been calling for more detailed analyses of ‘foreign influence in the U.S. pharmaceutical supply chain’, especially after the pandemic ‘exposed an over-reliance on China and other countries for the production of essential drugs.’ This has led to the ‘U.S. Pharmaceutical Supply Chain Review Act’, introduced by Republican Marco Rubio and Democrat Elizabeth Warren, to require the US government to study the effects of relying on foreign companies and foreign investment for the production of pharmaceuticals for the U.S. market and report within a year.<sup>28</sup>

Potential roles for government are emerging in supply chains in other ways:

- ‘Supply chain resilience’ is now at the forefront of the US federal Research and Development (R&D) agenda. The White House Office of Science and Technology Policy included the ‘improved resilience of critical infrastructure and U.S. advanced manufacturing to natural and man-made disasters, including cyber-attacks and exploitation of supply chain vulnerabilities’ in its R&D priorities for federal agencies for fiscal year 2021;
- President Biden has announced a general intention to ‘rebuild US supply chains that [aim] for broad-based resilience as opposed to pure self-sufficiency’, with ‘multiple Senate hearings to examine the integrity and reliability of critical supply chains following the onset of the pandemic’; and
- Provisions in Covid-19-related economic relief to ‘investigate medical supply chains’.<sup>29</sup>

Proposed interventions in the US have also included:

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<sup>26</sup> Shalal et al, 2020

<sup>27</sup> White House Review, June 2021, in Galbraith, 2021

<sup>28</sup> Zengerle, 2020

<sup>29</sup> Iakovou and White, 2020

- Mapping supply chains that may be critical to ‘health and economic security’ to ‘identify potential vulnerabilities’, including of ‘suppliers’ suppliers’ and ‘novel digital approaches to illuminate the relevant extended supply networks’ to examine data needed for new policy interventions;<sup>30</sup>
- President Trump discussed a possible ‘Economic Prosperity Network’ for alternative supply chains away from China: this has not moved beyond the discussion stage, especially since President Biden proposed bilateral trade talks with Beijing;<sup>31</sup>
- However, President Trump did sign an executive order giving a US overseas investment agency powers to help American manufacturers ‘produce everything America needs for ourselves and then export to the world, and that includes medicines’;<sup>32</sup>
- Republican Senator Josh Hawley has sought local content rules for medical supply chains, facilitated by ‘generous investment subsidies’, while White House economic advisers publicly discussed tax incentives to help re-shore manufacturing; and
- Other proposals have included President Trump’s trade adviser Peter Navarro’s suggestion that the federal government buy more American-made medicines and medical goods, and Treasury Secretary Steven Mnuchin suggesting building ‘trusted networks of drug and medical suppliers’.

The State Department is now working on a more *ad hoc* basis with ‘other agencies and foreign governments’ to move supply chains away from China, including returning some ‘manufacturing to the United States and expanding our base of international manufacturing partners’.<sup>33</sup>

President Biden’s January 2022 executive order asks the US government, ‘whenever possible, to procure goods, products, materials and services from sources “that will help American businesses compete in strategic industries and help America’s workers thrive” in order to ensure that the nearly \$600bn spent each year by the federal government on procurement keeps ‘the nation safe’. Should federal agencies want to grant waivers for foreign products to be purchased, ‘they will have to come to the White House and explain it to us,’ said Biden, for waivers to be ‘publicly posted and then small U.S. manufacturers will be given a chance to say whether they can fill that need’.<sup>34</sup>

After the ‘initial peak of its COVID-19 outbreak’, Beijing appears to have prioritised specific countries for the selective release of medical supplies.<sup>35</sup> Partly with this in mind, the US Coronavirus Aid, Relief, and Economic Security (CARES) Act included provisions such as: expanding drug shortage reporting requirements; requiring some drug manufacturers to draw up risk management plans; requiring the US Food and Drug Administration (FDA) to maintain a public list of medical devices of which there is a shortage; and directing the

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<sup>30</sup> Ibid

<sup>31</sup> Ibid

<sup>32</sup> Shalal et al, 2020

<sup>33</sup> According to a spokesperson, in Ibid

<sup>34</sup> Young, 2021

<sup>35</sup> Sutter, Schwarzenberg and Sutherland, 2021.

National Academies of Science, Engineering, and Medicine to conduct a study of pharmaceutical supply chain security.

Since 2019 there has been a flurry of US legislation related to these questions, in particular:<sup>36</sup>

- The Heroes Act (HR 8406), passed by Congress in May 2020, introducing more reporting requirements for drug manufacturers to report drugs that are ‘vulnerable to supply chain risks that could lead to shortages’, with new penalties for failing to report, and introducing measures to strengthen competitiveness in advanced pharmaceutical manufacturing by enhancing manufacturing programmes under the FDA, with a new supply chain flexibility manufacturing pilot program. The bill also aims to encourage research to enhance domestic production of critical Active Pharmaceutical Ingredients (APIs) and finished medicines by designating some research universities ‘National Centers of Excellence in Continuous Pharmaceutical Manufacturing’;
- The Intelligence Authorization Act for Fiscal Year 2021 (HR 7856) requires the Office of the Director of National Intelligence (ODNI) to report on China’s regulatory practices for pharmaceutical and PPE manufacturing, including an estimate of the percentage of global APIs made in China;
- The Restoring Critical Supply Chains and Intellectual Property Act (S 4324) includes provisions to re-shore supply chains for public health, including a 30 percent investment tax credit for qualifying medical PPE manufacturers;
- The Strengthening America’s Supply Chain and National Security Act (HR 6393), requiring firms to report their APIs’ sources;
- The Medical Supply Chain Security Act (S 3343) calls for improved medical supply chain security with greater FDA authority to request information on sources of drugs and devices, including requiring medical device manufacturers to report expected shortages;
- The Protecting Our Pharmaceutical Supply Chain from China Act (HR 6482) requires the FDA to create a registry tracking APIs and instituting a country-of-origin label for imported drugs, with economic incentives for producing pharmaceuticals domestically;
- The Securing America’s Pharmaceutical Supply Chain Act (HR 6731) would require executive agencies to restrict purchases of pharmaceuticals to drugs ‘over 50 percent sourced, manufactured, and assembled in the United States’ and direct the USTR to modify US product coverage under all FTAs and the WTO Government Procurement Agreement (GPA) to exclude coverage of essential medicines and certain medical products;
- The Safe Medicine Act (HR 5982) directs the Department of Health and Human Services to study US pharmaceutical supply chain vulnerabilities by issuing a report examining US dependence on China for critical APIs and gaps in domestic pharmaceutical manufacturing; and

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<sup>36</sup> Ibid

- The Pharmaceutical Independence Long-Term Readiness Reform Act (HR 4710) directs the Department of Defense to include a section in each national defence strategy outlining how it will address gaps in domestic pharmaceutical manufacturing and strengthen these supply chains, highlighting vulnerabilities.<sup>37</sup>

Comparisons between the US and other countries' strategies asks whether the need is for 're-shoring' or something more like 'reglobalization',<sup>38</sup> which may be equally effective at reducing China-related supply chain risks. Spurred by the pandemic, in 2020, Canada, Brazil, India, Italy, Japan, Korea, and Russia provided some state aid to producers of medical supplies and medicines.<sup>39</sup> Japan's Prime Minister announced a 'shift' in Japanese policy, including:

'For those products with high added value and for which we are highly dependent on a single country, we intend to relocate the production bases to Japan. Regarding products that do not fall into this category, we aim to avoid relying on a single country and diversify production bases across a number of countries, including those of the Association of Southeast Asian Nations'.

By April 2020 Japan had earmarked \$2.2bn to help its companies move manufacturing out of China: Chinese exports overall to Japan fell by half in February 2020.<sup>40</sup>

In France, Minister of the Economy Bruno Le Maire has also advocated supply chain reform, saying: 'This pandemic is an occasion to reflect collectively on how to reorganise value chains... on the necessary investments for the health sector and on how to better protect our borders... Protection is not the same as protectionism. Protection is the legitimate defence of our most strategic economic assets' (however neither French or German stimulus packages outlined funds for new supply chains).<sup>41</sup>

While Japan offered 'carrots' for firms to move away from China, US incentives specifically aimed for some expansion of production at home, such as deploying the Defense Production Act of 1950 to provide financial incentives. In July 2020, the US International Development Finance Corporation signed a letter of intent with Kodak to launch domestic production of pharmaceuticals: Kodak is to receive a state loan of \$765m to allow this. The US Departments of Defense and Health and Human Services were set to invest 'nearly \$630m to expand the domestic industrial base for medical resource suppliers'.<sup>42</sup>

Taiwan passed a law in 2019 to encourage its companies to build what it called a 'non-red supply chain' outside China, offering cheap finance and tax breaks for domestic investments.<sup>43</sup> India, Japan and Australia have launched the Supply Chain Resilience Initiative (SCRI) to reduce dependence on China<sup>44</sup> (the SCRI was launched in April 2021 for

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<sup>37</sup> Gibson, 2019

<sup>38</sup> Friedberg, 2020

<sup>39</sup> Evenett, 2020

<sup>40</sup> Ibid

<sup>41</sup> Ibid

<sup>42</sup> According to a US Department of Defense press release of August 21, 2020. In Ibid

<sup>43</sup> Kurian, 2021

<sup>44</sup> Iakovou and White, 2020



investment promotion and buyer-seller matching for supply chain diversification, and ministers responsible will convene at least annually to guide and consult on the initiative). The US and Taiwan have also signed a memorandum of understanding to improve public health cooperation. A former dean of National Taiwan University College of Public Health said that an 'important playing card in Taiwan's public health industry' was its 'great biotech R&D talents... more than 70% of them are trained in the United States'.<sup>45</sup>

There is now discussion at the diplomatic and civil society level of a possible 'Quad' alliance for resilient supply chains for COVID-19 vaccines, with 'the potential to enhance India's manufacturing capacity'. Researchers say that 'India's role within this vaccine initiative can potentially reinforce the country's credentials as a trusted manufacturer of quality vaccines and strengthen its reputation as the 'pharmacy of the world', a 'Quad supply chain'<sup>46</sup> that may have the potential to improve NHS supply security.

The following chapter provides an analysis of our data covering specific areas of Chinese supply to the NHS, including summarising the relevant trends, before we draw out conclusions and recommendations.

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<sup>45</sup> Huang, 2020

<sup>46</sup> De, Rana and Patel, 2021

### 3. Data analysis

As we have described, the aims of our data analysis are:

- To assess overall Chinese presence in NHS imports;
- To assess trends the Chinese presence in NHS imports since the beginning of the Covid-19 pandemic; and
- To assess these in the specific areas of:
  - personal protective equipment (PPE);
  - testing and diagnostic; and
  - medical devices and equipment.

#### **The Disaster Relief List and Commodity Classifications**

The Disaster Relief List is a list of commodities kept by the Government on which no import duty or VAT is paid. It encompasses medical supplies, equipment and protective garments that have been used to tackle the Covid-19 pandemic.

There are, at the time of writing, 228 commodities on the list which are matched to the commonly used trade international classifications. There are two systems of classification that are widely used. The first is the Harmonised Commodity Description and Coding System, known as the Harmonised System for short (HS). Each product is assigned a six-digit number with the first two signifying a broad group of products, the second two a slightly more detailed group within it, and the third two numbers an even more detailed group. In effect, the difference groupings nest within each other.

The second classification system is the Combined Nomenclature (CN), an eight-digit code, of which the first six are identical to HS. The last two digits are essentially an additional layer of granularity to describe the products in question. Because it is the most detailed, it is used in all subsequent analyses. Imports are measured in British pounds (£).

#### **Analysis of the Disaster Relief List: how much comes from China?**

Based on the most recently available data, between January and November 2021, 17 percent of the items on the Disaster Relief List come from China, as measured by their monetary value.<sup>47</sup>

However, such a figure masks important variations within broad product groupings, as seen in the table below, ranked by the size of the total value of all imports. Generally, our reliance on Chinese imports is most pronounced in testing and diagnostic products – some 37 percent of our imports. Between one quarter and one third of the value of PPE and ‘medical consumables’ comes from China; the share of medicines overall is low, at 2

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<sup>47</sup> Data are downloaded from HM Government (2022). *UK Trade Info: Trade Data*. <https://www.uktradeinfo.com/trade-data/ots-custom-table/>

percent. Meanwhile, 22 out of the 228 items on the entire Disaster Relief List have a Chinese import rate greater than 50 percent.

Please note that, regarding the category names in the tables below, the apparently ambiguous ‘combined categories’ (of ‘PPE and other protective equipment/Medical Consumables’ and ‘Medical Devices and Equipment; Disinfectants/Sterilisation products’) refer to a relatively small number of products that fit into more than one category (for example the ‘PPE and other protective equipment/Medical Consumables’ category includes items made of cloth/fabric that are used in hospital treatment but not worn, such as disposable bed sheets).

*Table 1. Categories of products on Disaster Relief List by broad product groupings, percentage of UK total imports from China – January to November 2021*

Product Group	Imports from China (£)	Imports from world (£)	%
Medicines	£210,111,754	£12,227,510,674	2%
Testing and diagnostic	£3,538,133,713	£9,445,188,068	37%
Medical Devices and Equipment	£856,908,559	£6,149,471,452	14%
PPE and other protective equipment	£649,619,772	£2,136,670,479	30%
Disinfectants/ Sterilisation products	£85,208,182	£1,849,770,928	5%
Medical Consumables	£341,926,955	£1,434,185,073	24%
PPE and other protective equipment/Medical Consumables	£415,260,559	£1,568,296,374	26%
Medical Devices and Equipment; Disinfectants/Sterilisation products	£91,257,683	£461,516,000	20%
Cleaning equipment	£15,798,816	£270,714,366	6%
<b>Total</b>	<b>£6,204,225,993</b>	<b>£35,543,323,414</b>	<b>17%</b>

Source: UK Trade Info

Looking now at products in more detail, the table below shows the top forty products where the reliance on Chinese imports is most pronounced.

The product with the highest share coming from China is ‘cellulose/paper masks’, generally meaning disposable face masks, at 90 percent of the value of imports. Another notable inclusion is Covid-19 test kits, at 63 percent; other apparently more sundry products are also essential, such as thermometers, with 59 percent from China. (Please note that ‘protective garments’ appears multiple times on the Disaster Relief List, reflecting distinctions in the CN8 classification – for example ‘Garments, knitted or crocheted, rubberised (excl. babies’ garments and clothing accessories)’ and ‘Garments, knitted or crocheted, impregnated, coated or covered with plastics or other materials (excl. rubberised and babies’ garments and clothing accessories)’).

Table 2. Top forty Disaster Relief List products, ranked by percentage of imports from China<sup>48</sup>

Product	China (£)	World (£)	%
Cellulose/paper masks; Apparel and clothing accessories	£24,423,569	£27,127,042	90%
Hydrocortisone	£725,768	£838,214	87%
Absorbent pads of non-woven textiles for hospital beds	£2,921,836	£3,707,493	79%
Other protective garments	£38,309,783	£48,615,478	79%
Wadding, gauze, bandages, cotton sticks and similar articles	£12,517,251	£16,071,174	78%
Other protective garments	£1,657,556	£2,189,531	76%
Ultra-violet LED lamps	£107,784,577	£142,628,146	76%
Rubber materials	£24,552,885	£32,634,116	75%
Equipment for setting up field hospitals	£59,510,662	£81,427,768	73%
Equipment for setting up field hospitals	£26,491,270	£36,273,454	73%
Plastic gloves; other protective garments	£110,916,551	£160,025,366	69%
Cellulose/paper masks; Disposable boot covers/overshoes made of cellulose/paper; Paper bed sheets	£6,175,039	£9,149,062	67%
COVID-19 Test Kits	£3,454,557,760	£5,440,820,963	63%
Humidifiers	£15,116,713	£24,184,748	63%
Mop head	£10,374,868	£17,090,661	61%
Thermometers	£1,284,680	£2,177,251	59%
Kidney basins	£25,459,290	£43,633,496	58%
Gloves	£13,689,405	£25,457,858	54%
Absorbent pads of non-woven textiles for hospital beds	£1,676,670	£3,224,531	52%
Thermometer	£497,435	£959,601	52%
Bed pans	£98,939,173	£192,370,978	51%
Nonwovens; Absorbent pads of non-woven textiles for hospital beds	£2,236,709	£4,465,348	50%
Gloves	£24,612,279	£50,346,642	49%
Other protective garments	£3,996,252	£8,714,301	46%
Monitors	£41,095,165	£91,544,646	45%
Protective garments	£19,151,561	£43,966,275	44%
Ranitidine	£3,377,762	£7,774,145	43%
Cellulose/paper masks; Paper bed sheets; Disposable Boot covers/overshoes made of cellulose/paper	£17,406,171	£40,247,892	43%
Emergency trolleys; Wheelchairs	£17,581,240	£41,548,029	42%
Protective garments	£11,293,861	£27,004,292	42%
Gloves	£9,164,334	£22,281,414	41%
Other protective garments	£6,668,003	£16,257,134	41%
Protective garments	£9,546,397	£25,478,830	37%
Protective garments	£10,022,394	£26,856,477	37%
Wadding, gauze, bandages, cotton sticks and similar articles	£28,037,979	£75,787,746	37%
Absorbent pads of non-woven textiles for hospital beds	£4,763,553	£12,895,373	37%

<sup>48</sup> Please note that some items in this table are repeated, reflecting differences in the classification of CN8. For example, 'Equipment for setting up field hospitals' appears twice because there are two separate categories under which such equipment may fall. They are: 'Tents of synthetic fibres, including temporary canopies...' and 'Tents of textile materials, including temporary canopies...'. We have labelled them in order to distinguish them; for reasons of space, we have not provided more detailed explanations.

Ultra-violet lamps	£10,467,495	£28,354,066	37%
Gloves	£114,791,455	£317,848,783	36%
Empty medical gas cylinders, portable, for oxygen, fitted with a valve and a pressure and flow regulator (steel or steel alloy)	£1,518,964	£4,281,561	35%

Source: UK Trade Info

### Supplies of personal protective equipment (PPE)

Because there are so many categories that fall within the ‘PPE’ label, it makes sense to look at them on a more granular level. (Note that products with multiple CN8 codes are grouped together). Doing so reveals the variation with which the UK sources PPE from China, depending on the product in question. For example, while up to 90 percent of paper masks come from China, just 24 percent of polyethylene aprons do.

Table 3. Categories of products classed as PPE, percentage of imports from China

Product	China (£)	World (£)	%
Boot covers/overshoes – made of plastic or rubber, disposable	£35,925,058	£128,568,857	28%
Cellulose/paper masks; Apparel and clothing accessories	£24,423,569	£27,127,042	90%
Cellulose/paper masks; Disposable boot covers/overshoes made of cellulose/paper; Paper bed sheets	£6,175,039	£9,149,062	67%
Cellulose/paper masks; Paper bed sheets; Disposable Boot covers/overshoes made of cellulose/paper	£17,406,171	£40,247,892	43%
Face and eye protection	£9,678,413	£29,643,052	33%
Gloves	£232,887,649	£988,683,553	24%
Latex	£0	£40,244	0%
Nonwovens; Absorbent pads of non-woven textiles for hospital beds	£32,155,808	£268,013,965	12%
Other protective garments	£54,004,389	£86,690,383	62%
Plastic gloves; other protective garments	£110,916,551	£160,025,366	69%
Plastic materials	£359,523,541	£1,250,885,455	29%
Polyethene apron	£3,975,245	£16,771,296	24%
Protective garments	£165,963,149	£653,903,898	25%
Protective spectacles and visors	£11,845,749	£45,216,788	26%

Source: UK Trade Info

### Supplies of medicines

While the share of medicines on the Disaster Relief List sourced from China is typically relatively low, it does not mean there are not individual categories of product without substantial dependency. The full list of products or categories classified as ‘medicines’ is presented in the table below.

Table 4. Categories of products classed as medicines on the Disaster Relief List, percentage of imports from China

Product	China	Total	%	Notes
Azithromycin, Ceftazidime, Ceftriaxone, Doxycycline, Meropenem, Vancomycin, Azithromycin, Amikacin	£306,596	£162,892,293	<1%	
Chlorhexidine	£5,724,844	£19,257,629	30%	Reduces the number of germs in the mouth and on the skin.
Chlorhexidine, Dobutamine, Enoxaparin Sodium, Fentanyl, Haloperidol, Levomepromazine, etc.	£96,957,920	£8,096,247,026	1%	
Chloroquine	£1,642,417	£22,898,994	7%	
Clavulanic Acid, Remdesivir	£22,316,436	£314,887,825	7%	
Dexamethasone	£3,647,563	£38,240,485	10%	Steroid used to treat skin problems, allergies, lupus, etc.
Dexamethasone, Hydrocortisone	£85,206	£392,026,192	<1%	
Digitalis glycosides	£11,618	£565,259	2%	
Dobutamine	£637,963	£5,787,367	11%	
Doxycycline	£1,336,528	£8,154,044	16%	Antibiotic used to treat bacterial infections.
Enoxaparin Sodium	£0	£8,516,172	0%	
Fentanyl	£0	£885,386	0%	
Haloperidol, Omeprazole	£37,929,657	£136,500,277	28%	Treat severe mental illness and stomach problems, respectively.
Heterocyclic compounds with oxygen hetero-atom[s] only	£9,702,353	£45,692,824	21%	Chemicals with wide medical applications.
Hydrocortisone	£725,768	£838,214	87%	Steroid used to reduce pain, itching and swelling.
Hydrogen peroxide presented as a medicament, Paracetamol, Ritonavir, Remdesivir	£488,580	£327,335,638	<1%	
Ipratropium Bromide	£89,584	£791,488	11%	Opens airways to the lungs.
Ipratropium Bromide, Morphine, Codeine	£77,650	£124,922,051	<1%	
Levomepromazine	£6,775	£1,111,436	1%	
Meropenem, Vancomycin, Azithromycin, Amikacin, Ceftazidime, Ceftriaxone	£5,275,583	£63,775,751	8%	Antibiotics.
Metoclopramide, Paracetamol	£8,988,950	£92,354,043	10%	Metoclopramide is used to reduce sickness, particularly after cancer treatments.
Midazolam	£0	£108,279	0%	
Milrinone	£4,419,318	£2,060,799,249	<1%	
Morphine, Codeine	£0	£30,448,729	0%	
Ondansetron	£782,411	£144,775,095	1%	
Piperacillin, Amoxicillin	£836,571	£38,888,001	2%	
Piperacillin, Amoxicillin, Clavulanic Acid	£3,328	£37,531,659	<1%	
Propofol	£35,858	£8,287,603	<1%	
Ranitidine	£3,377,762	£7,774,145	43%	Reduces acid in the stomach, used to treat indigestion or heartburn. Currently not available on NHS due to a risk of

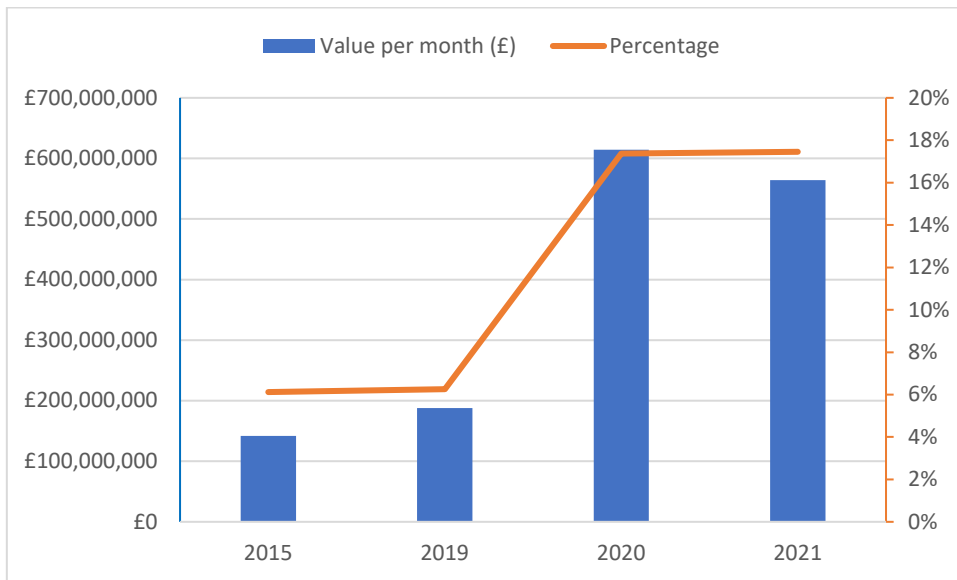
				possible carcinogenic effects. <sup>49</sup>
Ritonavir	£4,704,515	£35,217,520	13%	Used to treat HIV/AIDS.

Source: UK Trade Info

**What has been the trend?**

Before the COVID-19 pandemic, the level of reliance on PRC-manufactured products in the overall Disaster Relief List was minimal, at 6 percent, as illustrated in the graph below. In 2020, it rose to 17 percent, and is currently at this level, encompassing the period January to November 2021. The UK has arguably fulfilled an urgent need by importing these products. Now would be a prudent time for the government to begin questioning why it is that the UK is still almost as reliant on PRC-manufactured products, as it was during the height of the pandemic.

Figure 1. Percentage and value of Chinese imports on Disaster Relief List



Source: UK Trade Info

From the table below, we can also see that much of the increase in reliance on China is linked to a selection of broad categories of product on the Disaster Relief List. This is most notable in ‘testing and diagnostic’ products, which stood at 2 percent in 2015, rising to 37 percent in 2021. The other substantial growth was in ‘disinfectants/sterilisation products’, rising from 3 percent in 2015 to 12 percent in 2020, before falling again. The share of medicines sourced from China is small and remains so. For PPE, the reliance predates the pandemic.

<sup>49</sup> NHS (2022). *Medicines A to Z: Ranitidine*. <https://www.nhs.uk/medicines/ranitidine/>

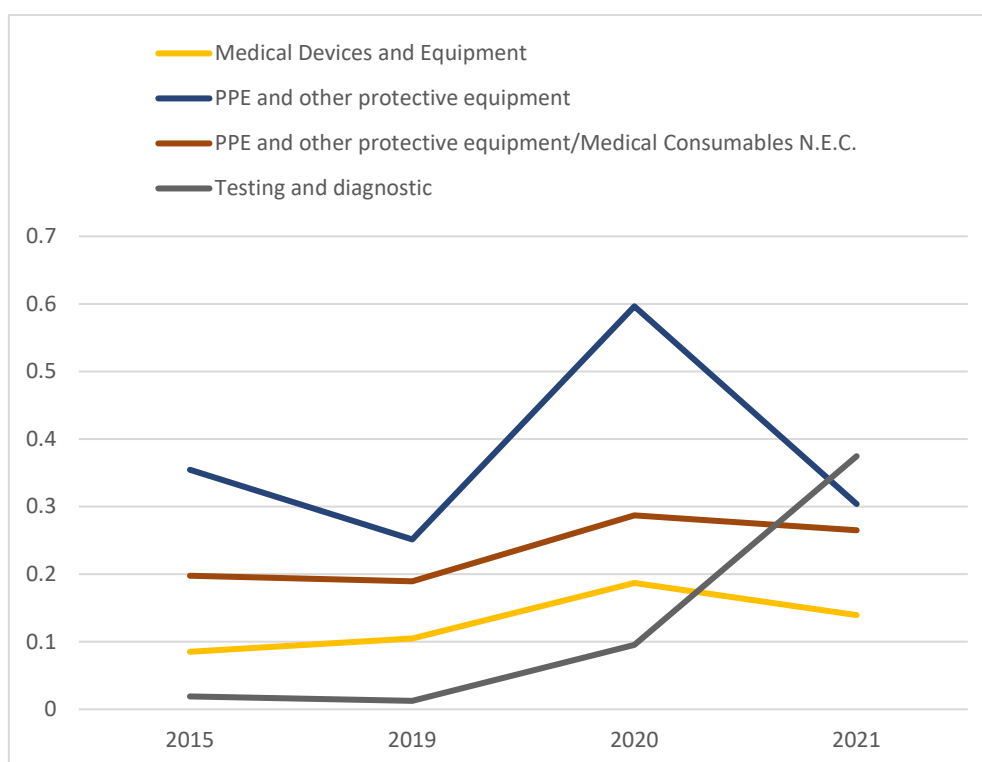
Table 5. Changes in percentages of imported broad product groupings from China

Product grouping	2015	2019	2020	2021
Medicines	1%	1%	1%	2%
Testing and diagnostic	2%	1%	10%	37%
Medical Devices and Equipment	9%	10%	19%	14%
PPE and other protective equipment	35%	25%	60%	30%
Disinfectants/ Sterilisation products	3%	4%	12%	5%
Medical Consumables	22%	21%	23%	24%
PPE and other protective equipment/Medical Consumables	20%	19%	29%	26%
Medical Devices and Equipment; Disinfectants/Sterilisation products	27%	21%	19%	20%
Cleaning equipment	10%	5%	8%	6%

Source: UK Trade Info

Table 5 highlights the worrying fact that the UK's reliance on the PRC for medicines has doubled, and that testing and diagnostic equipment has over trebled. The following figure also outlines the trend between 2015 and 2021 in selected major categories of product, by percentage of imports from China.

Figure 2. Selected categories by percentage of imports from China (2015-2019)





## Changes in specific products

The table below outlines changes in specific, individual products on the Disaster Relief List, and how reliance on China has increased between 2015 and 2021. It shows the twenty products which have shown the greatest increases.

Table 6. Top 20 products with the greatest **increase** in percentage of imports from China (2015 to 2021)

Product	2015	2019	2020	2021
Ultra-violet LED lamps	0%	62%	65%	76%
COVID-19 Test Kits	1%	2%	26%	63%
Hydrocortisone	35%	10%	45%	87%
Monitors	0%	44%	59%	45%
Absorbent pads of non-woven textiles for hospital beds	8%	11%	59%	52%
Cellulose/paper masks; Apparel and clothing accessories	47%	50%	89%	90%
Nonwovens; Absorbent pads of non-woven textiles for hospital beds	11%	45%	63%	50%
Other protective garments	41%	47%	75%	79%
Absorbent pads of non-woven textiles for hospital beds	43%	64%	60%	79%
Empty medical gas cylinders, portable, for oxygen, fitted with a valve and a pressure and flow regulator (steel or steel alloy)	1%	26%	3%	35%
Decontamination / sanitizing tunnels or chambers	0%	19%	25%	33%
Rubber materials	44%	50%	66%	75%
Humidifiers	32%	57%	44%	63%
Absorbent pads of non-woven textiles for hospital beds	8%	23%	37%	37%
Gloves	10%	5%	56%	36%
Ranitidine	19%	25%	31%	43%
Cellulose/paper masks; Disposable boot covers/overshoes made of cellulose/paper; Paper bed sheets	44%	47%	91%	67%
Other protective garments	52%	41%	88%	76%
Emergency trolleys; Wheelchairs	20%	39%	43%	42%
Thermometer (infrared or digital)	0%	0%	23%	22%

Source: UK Trade Info

A general rise does not mean that all specific products have seen rises in reliance on China. Indeed, there are some for which dependency has declined. The table below shows the top twenty products or categories on the Disaster Relief List which have shown the greatest decrease between 2015 and 2021. (Note that there are categories that fall under PPE that have shown substantial decreases, items classified as ‘protective garments’.)

Table 7. Top 20 products with the greatest **decrease** in percentage of imports from China (2015 to 2021)

Product	2015	2019	2020	2021
Dobutamine	65%	39%	17%	11%
Doxycycline	62%	35%	21%	16%
Absorbent pads of non-woven textiles for hospital beds	38%	11%	10%	10%
Protective garments	69%	49%	76%	42%

Ethers, ether-alcohols, ether-phenols, ether-alcohol-phenols, alcohol peroxides, ether peroxides, ketone peroxides	23%	11%	83%	0%
Protective garments	49%	25%	39%	28%
Protective garments	59%	42%	40%	37%
Protective garments	35%	37%	23%	14%
Protective garments	45%	23%	22%	27%
Midazolam	15%	0%	0%	0%
Empty medical gas cylinders, portable, for oxygen, fitted with a valve and a pressure and flow regulator (steel or steel alloy)	33%	42%	42%	19%
Protective garments	31%	23%	24%	17%
Heterocyclic compounds with oxygen hetero-atom[s] only	35%	35%	28%	21%
Protective garments	51%	34%	32%	37%
Other protective garments	59%	33%	42%	46%
Protective garments	31%	15%	13%	18%
Tubes	27%	14%	15%	15%
Hand Hygiene	24%	9%	12%	13%
Transparent adhesive plasters (including surgical tape)	37%	33%	35%	26%
Gloves	52%	49%	44%	41%

Source: UK Trade Info

## 4. Conclusions and discussion

We have proposed that a schema of the types of risk created by China's presence in health supply chains might be broadly understood as follows:

- First, so-called 'chokehold' risks, such as control over supplies giving the PRC leverage through the theoretical ability to 'switch off' medical supplies;
- Second, whether supplying a product leads to potential access to sensitive data; and
- Third, where the geopolitical context may create risk in more general terms, such as benefitting China's mercantilism and exacerbating the impact of Chinese state funding harming foreign competition.

Predominantly the first type of risk should be considered for the three main categories of import above. In particular, 'chokehold' risks appear to apply to PPE but also to exist outside it, such as in the imports of provisions required to set up field hospitals. As we have suggested, the Government will need to consider how this might affect UK national security through the capacity to respond to pandemics like Covid-19 in the future.

In the category of personal protective equipment (PPE), the percentage of imports from China rose from 35% in 2015 to 60% in 2020, before dropping to around its pre-pandemic level, at 30%, in 2021; in the category of testing and diagnostic, from 2% in 2015 to 37% in 2021; and in the category of medical devices and equipment, from 9% in 2015 to 14% in 2021.

That in the category of personal protective equipment (PPE), the percentage of imports from China has fallen back to its previous level of around 30-35%, having risen to 60% in 2020, demonstrates that a properly-implemented strategy such as that described in the Department of Health and Social Care (DHSC) *Personal protective equipment (PPE) strategy: stabilise and build resilience of 2020* can have a beneficial effect.

The Government has described how the Department of Health and Social Care's 2020 *Personal protective equipment (PPE) strategy: stabilise and build resilience* 'sets out how the UK government is moving beyond the emergency COVID-19 response to stabilise and build resilience.'<sup>50</sup> The strategy described how it would ensure 'the right PPE equipment is available at the right time to protect frontline health [staff]'. It also explains how, before the Covid-19 pandemic, PPE was mainly procured from the PRC, but

'that situation changed rapidly in March 2020. As the pandemic unfolded across the world, supply chains and transportation links were disrupted, and demand increased to unprecedented levels across the globe... Disruptions in Chinese manufacturing fractured global supply chains, creating shortages in the face of soaring demand.'<sup>51</sup>

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<sup>50</sup> Department of Health and Social Care (2020). *Personal protective equipment (PPE) strategy: stabilise and build resilience*.

<sup>51</sup> Ibid

UK-manufactured supply is now anticipated to meet 70% of forecasted demand for all PPE categories (excluding gloves).

If the strategy does not discuss potential political leverage directly, it tacitly acknowledges that dependence on Chinese-made supplies carries substantial risks. The strategy also describes how it is 'building further resilience':

'A resilient supply chain system is capable of withstanding, adapting to, and recovering from disruption so that it can continue to meet supply needs. In the case of a pandemic, a resilient system can raise production to meet increased demand... Detailed analysis of DHSC's supply options for each category of medical-grade PPE has been conducted with the primary objective of resilient security of supply.'<sup>52</sup>

However, the solution that is currently being pursued by Government is broadly to stockpile and to manufacture more at home, *but in this limited specific area*:

'Our improved PPE supply chain can support and align with our goals for UK industry, levelling up jobs and skills across the country, and doing so in a way that is ethically responsible, supporting our ambition to eradicate modern slavery, and greener, helping us realise our net-zero ambition...'<sup>53</sup>

The Government has also established a cross-government PPE sourcing unit with over 400 staff to secure new international supplies, contracting more than 175 new suppliers (an operation involving the FCO, DIT, MOD, DHSC, the Cabinet Office and NHS procurement).

The strategy appeared the same year as warnings from various think tanks about the dangers of a failure to 'decouple' generally from the PRC. One wrote:

'The inability to produce and source Personal Protective Equipment via globalised supply chains has reminded democratic governments and peoples that it is necessary to be able to produce strategic commodities, just as China's actions and behaviour have reminded them of the authoritarian nature of the Chinese Communist Party (CCP).'<sup>54</sup>

The 'Critical 5' countries (Australia, Canada, New Zealand, the UK and the US) have defined the five fields of critical infrastructure:

1. Communications
2. Energy
3. Healthcare and public health
4. Transportation systems
5. Water (including wastewater and storm water systems)

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<sup>52</sup> Ibid

<sup>53</sup> Ibid

<sup>54</sup> Rogers, J., Foxall, A., Henderson, M. and Armstrong, S. (2020). *Breaking the China Supply Chain: How the 'Five Eyes' Can Decouple from Strategic Dependency*. Henry Jackson Society.

They define ‘strategic dependency’ therein – on China – as being when a country is a net importer of a good; imports more than 50% of its supplies from China; and China controls over 30% of the global market of that good.<sup>55</sup> The inherent risk is that dependency on any foreign supplier becomes a threat to national security – ‘particularly if a major supplier emerges as a geopolitical and/or an ideological rival’.<sup>56</sup>

Following these warnings, Boris Johnson declared that he sought more self-sufficiency to ‘end reliance on Chinese imports’,<sup>57</sup> asking civil servants to craft ‘Project Defend’ to end the UK’s ‘reliance on China for vital medical supplies and other strategic imports’. Officials have been tasked for almost two years with identifying ‘economic vulnerabilities to potentially hostile foreign governments’, leading to the ‘repatriation’ of ‘key manufacturing capabilities’ like pharmaceuticals, as part of a new ‘national resilience framework’ for the resilience of ‘essential supplies’. One group is tasked with ‘planning for future events — no matter what they might be’; a second ‘capabilities’ group has been analysing how the Government can help ‘onshore’ critical production ‘such as pharmaceutical supplies’.<sup>58</sup> According to then-Foreign Secretary Dominic Raab, the approach showed that there could be no return to ‘business as usual’ with China.<sup>59</sup> Given that this research highlights a significant reliance on China for PPE, testing and diagnostics, certain critical medicines and medical equipment, now would be a prudent time for the government to provide an update on Project Defend.

### **Emerging responses internationally**

The concept of ‘ally-shoring’ would help create alternatives to help countries avoid the ramifications of becoming embedded in Chinese-dominated supply chains, with the potential leverage that this risks giving Beijing over political life.<sup>60</sup>

A report by the US Congress<sup>61</sup> proposes that this kind of ‘collaboration with like-minded countries [especially] to counter the effects on lesser-developed economies that could be hit particularly hard by the COVID-19 pandemic’. It warns that China will seek to keep any market share it has accrued in the pandemic, especially to advance its Made in China 2025 industrial policy goals in biotechnology, pharmaceuticals, and medical equipment. It suggests that ‘the United States and other countries may seek to diversify away from China’, highlighting ‘UK Prime Minister Boris Johnson’s suggestion of a D-10 alliance’. It also proposes that medical supplies be linked to the ‘Clean Network strategy’ launched by the Trump Administration, given its potential for ‘closer trading ties among like-minded countries in sensitive technologies and sectors’ (the Clean Network programme is a ‘comprehensive approach to safeguarding the nation’s assets including citizens’ privacy and

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<sup>55</sup> Ibid

<sup>56</sup> Ibid

<sup>57</sup> Oliver Wright and Lucy Fisher. ‘Boris Johnson wants self-sufficiency to end reliance on Chinese imports’. *The Times*. 22 May 2020.

<sup>58</sup> Ibid

<sup>59</sup> Institute of Export and International Trade (2020). *Project Defend: New approach to national security aims to diversify supply and ‘reshore’ manufacture*. 22 May 2020.

<sup>60</sup> Dezenski and Austin, 2020

<sup>61</sup> Sutter, Schwarzenberg and Sutherland, 2021

companies' most sensitive information from aggressive intrusions by malign actors, such as the Chinese Communist Party').<sup>62</sup>

A series of other recommendations were also made in US Congressional testimony by Rosemary Gibson,<sup>63</sup> and those which are relevant we outline here:

- First, a 'Point of Accountability' in Government, embedded within the National Security apparatus, to '[a]ssure an unfettered supply of quality medicines from trustworthy sources'. This office and/or individual would collect market intelligence, monitor global supply and demand, conduct supplier risk assessments, and recommend necessary investments for domestic production to assure public health and national security.
- Second, a National Health Security Strategy would strengthen the industrial base for the uninterrupted supply of generic medicines and their ingredients to ensure uninterrupted operations of hospitals and the health care system, mindful that a 'robust and resilient industrial base capable of manufacturing generic medicines and their essential ingredients should be a national health security, public health, and national security priority'. By implication it would be government policy to reduce vulnerability to any 'disruption in supply of medicines and their essential ingredients'.
- Third, the disclosure of country of origin of medicines supplied to the military in order to protect service personnel: this would include pharmaceutical ingredients; defence services would also test for quality and, where necessary, independently (though 'regrettably'), test selected drugs, as well as procure where necessary based on a more developed concept of 'value' instead of cheapest price, which has been liable to increase military dependence on China.
- Fourth, fund pilot projects to demonstrate feasibility of commercial-scale manufacturing of generic drugs to meet national health security needs (again, by implication, this would mean where 'ally-shoring' is not possible).
- Fifth, Gibson addresses the issue of the supply of heparin, the blood-thinner commonly used in hospitals, of which China produces around 80 percent of global supply of the pig intestines necessary for its production (which Gibson calls the 'rare earths' of medical supply). In 2018, an African swine flu virus pandemic swept through China with devastating results; a decade before, blue ear disease decimated China's pig population, and with an impending shortage, criminals in its heparin industry developed a lethal substitute, which after being shipped to the US and elsewhere is believed to have resulted in at least 246 deaths.<sup>64</sup> In 2014, the US Food and Drug Administration Science Board discussed heparin shortages, noting that despite 'virtually all the heparin coming from a single country', the US government could not order domestic pig producers 'to put all of their pig guts after slaughter into heparin production' and described this as a high-level national security concern.

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<sup>62</sup> Ibid

<sup>63</sup> Gibson, 2019

<sup>64</sup> Edney, 2016.

Here, Gibson has proposed that, in the US, the Committee on Foreign Investment in the United States (CFIUS), whose UK equivalent is the Investment Security Unit (ISU), should also review the health and national security implications of Chinese company ownership of pork processor and hog producers (CFIUS members do not currently include the Secretary of the Department of Health and Human Services): this could be applied to medical-related animal and other supplies generally.

### Resulting proposals for the UK

The next stage of Project Defend may include an assessment of how, within future UK state aid rules, the Government can incorporate a similar programme to that recently launched by Japan, and **help UK firms in selected fields re-shore or ‘ally-shore’ sensitive manufacturing**, including in the sectors above. Japan has imposed strict limits on foreign participation in state procurement, establishing a cabinet-level division to assess related threats to security.<sup>65</sup>

The UK should also follow-up the early DHSC strategic document with an updated and more **comprehensive strategy** for this area, **outline priorities for NHS and medical supplies specifically**, as well as for the **priority areas of ‘testing and diagnostic’ and ‘medical devices and equipment’ – and medicines and their ingredients**. We also suggest that the schema above may be a useful means that could inform assessment by Government, in particular the Project Defend ‘future events planning group’, on acceptable levels of import risk.

In a reply to a Parliamentary question, Lord Grimstone has said that the Government is ‘considering import dependency and will continue to analyse imports, including from China, to determine whether the UK is particularly reliant on certain of our trading relationships.’ He added that Project Defend ‘will analyse critical supply chains [including for] medical supplies’.<sup>66</sup> By implication, the Government would be well placed to provide an update about the **status and remit of Project Defend**.

The various medical supply shortages during Covid-19, which one consultancy describes as ‘perhaps not surprising when 80–90% of generic medicines used in the NHS are imported’ has led to the growing public perception ‘that the UK is over-dependent on China and other nations for manufacturing,’ with ‘an expectation of a shift towards re-shoring, even if it is more expensive... principally to reduce risk and guarantee supply.’ Inflation is now adding to the need to diversify supply chains. The UK Government has invested £93m in the UK’s first dedicated Vaccine Manufacturing and Innovation Centre, beginning with Coronavirus vaccine production, and has guaranteed £38m for a UK rapid deployment facility.

The House of Lords Select Committee on International Relations and Defence has proposed that:

‘The current passage through Parliament of the Telecommunications (Security) Bill is a clear sign of the Government’s concerns over supply chain vulnerability in that

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<sup>65</sup> Dooley and Inoue, 2020.

<sup>66</sup> Hansard, Volume 804, 1 July 2020.

area, but such vulnerabilities are widespread in the economy. The COVID-19 pandemic has served to highlight this weakness. With dependency comes risk, and China has on several occasions demonstrated its willingness to use economic and supply chain coercion in support of its international policy. In order to retain its freedom of action towards China, the Government should conduct scenario planning on supply chain vulnerabilities and identify where action is needed to mitigate the risks.<sup>67</sup>

The Bill that the Peers discussed is now the Telecommunications (Security) Act 2021, which provides for the security of public electronic communications networks. Therefore, one **possible approach is an equivalent National Health Service (Security) Act** to provide for the security of NHS supply chains and all related devices and equipment. Such an Act would preferably include a registry whose data would include tracking APIs, and a commitment to report on medical supply chain vulnerabilities and the dependence and vulnerability of this supply chain to China, plus a future publication to update the Integrated Review on how the UK will address vulnerabilities in medical manufacturing.

Such an Act would likely gain majority approval in both Houses of Parliament, with the Telecommunications (Security) Act 2021 setting a recent precedent for the requirement to ensure mitigation at all levels of supply chain risk. With the onus for compliance with all communications service providers, and enforced by Ofcom, the Act is relatively straight forward to understand, implement, and enforce. The subsequent enforcement of a similar National Health Service (Security) Act could readily be made the responsibility of the ISU, or another separate unit within the Department for Business, Energy, and Industrial Strategy, or within the Department for Health & Social Care (though naturally this may produce a conflict of interest which a separate department would mitigate against). Whilst enacted through Royal Assent relatively smoothly in 2021, the Telecommunications (Security) Act may prove a challenge to compliance, particularly as the government is due to issue additional legislation after an ongoing open consultation process. A similar National Health Service (Security) Act would need to be mindful to both compliance and enforcement challenges, in order to maintain early structural integrity when reducing the reliance of critical parts to the NHS' medicines, PPE, testing, and equipment supply chains.

With a growing understanding of the need to secure UK medical product and medicine manufacturing capacity, the following are possible actions the Government might consider, which might also form areas of such an Act.

### **1. Areas for Government review of China and medical supply chain risks**

In a **broad review of how to reduce the risks of over-reliance on China for essential medical products**, it is increasingly important that the UK **build a complete picture of reliance on China for medical products, devices, and medicines**, including, as in the US, reporting on China's regulatory and economic practices for medical manufacturing. Government would also be well served to **carry out a new comparative assessment of other countries' developing responses**, including emerging proposals not yet enacted.

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<sup>67</sup> International Relations and Defence Committee, 2021 (Paragraph 334)



These would include in the US, Japan and Taiwan. In the United States, enacted and proposed interventions have included:

- Government publishing a **study of pharmaceutical supply chain vulnerabilities**, examining dependence on China in critical areas and associated gaps in domestic pharmaceutical manufacturing;
- Directing the Department of Defense to include a section in **each national defence strategy** outlining how it will address gaps in domestic pharmaceutical manufacturing and strengthen associated supply chains;
- **Mapping supply chains** that may be critical to **'health and economic security'** to 'identify potential vulnerabilities'.

In the UK, revision documents to the Integrated Review of 2021 might include similar studies. In the UK as elsewhere, supplies to the armed forces could be called the 'sharp end' of such risks, implying a need to review supplies and stockpiles like a review of the associated Chinese presence in related animal product supplies, such as for heparin.

Meanwhile China's mercantilist strategy may lead to a more general discussion within Government about where procurement from China might be reconsidered even beyond medical supply chains. More immediately, the Government could **report on the impact of China's economic practices on medical supply chains** and security elsewhere. This might include its view on how best to respond to the pricing behaviour of Chinese producers, also publishing a full assessment of the health security ramifications of **China's medical ingredient supplies**, including products where **previous contamination** incidents imply an unacceptable level of risk, and where the Government believes **Chinese-made supplies should be prevented from entering the United Kingdom**.

## 2. Possible domestic reforms and incentives

We propose that the UK would also benefit from a **'Point of Accountability' in Government tasked with ensuring medical supply chain security**, within a comprehensive **National Health Security Strategy focused on these threats**, to reduce vulnerability to 'disruption in supply of medicines and their essential ingredients'.

A number of Acts in the US have aimed to nurture research into where domestic production may be needed, including at university centres of excellence. The UK could also investigate the **role of tax credits, preferably ahead of subsidies, in reshoring or 'ally-shoring'** crucial medical manufacturing. Taiwan has passed laws encouraging its firms to build non-Chinese supply chains, with financing and tax advantages, including for domestic investments.

## 3. Possible projects with allies for alternative supply chains

One of the central questions for UK policy is where Government should seek 're-globalisation' instead of 're-shoring' to become less dependent on the Chinese supply chains which have become entrenched, in part, through mercantilist behaviours. Re-globalisation would include the concept of ally-shoring, which could also help developing countries avoid the potential political leverage that could result from reliance on Chinese suppliers. The US Congress has also discussed 'collaboration with like-minded countries... to counter the

effects on lesser-developed economies that could be hit particularly hard by the COVID-19 pandemic’.

The UK could, for example, study **‘Quad’-oriented medical supply chains**, including their capacity to improve medical manufacturing security in India as the ‘pharmacy of the world’, given its reliance on Chinese chemicals and other ingredients. It might also consider the role of other forms of ‘Economic Prosperity Network’ for alternative supply chains, including the **Supply Chain Resilience Initiative (SCRI) launched by India, Japan and Australia** to reduce dependence on China.

#### **4. Enforcement of and mutual support to the Health and Care Act**

The Health and Care Act achieved Royal Assent in April 2022. During the passage of this Bill a proposed amendment gained cross-party support to ban health-related imports from countries and regions where there is risk of genocide. A subsequent Private Members Bill has been introduced which would restrict medical and health-related supply chains where modern slavery is involved, including in Xinjiang, in western China. Whilst the FCDO has remained unsupportive in labelling the gross human rights atrocities in Xinjiang against ethnic Muslim Uyghurs as genocide (despite strong calls for such from the US Senate, the Canadian government, and by both the UK Parliament and the UK Foreign Affairs Select Committee<sup>68</sup>), the Department for Health (whom sponsorship for the Bill rests) ought to be such inclined. The UK cannot continue to import PPE manufactured in Xinjiang.

In January 2021, *The Telegraph* reported that the UK government, during the scramble for sourcing PPE in the pandemic, imported £150 million worth of equipment from Chinese companies with extensive links to human-rights abuses in Xinjiang, two of whom were under US import bans.<sup>69</sup>

A proposed National Health Service (Security) Act must seek to reinforce the hopefully accepted amendments to the Health and Care Bill once enacted into legislation, by offering an additional measure of checks and balance to ensure that UK medical supply chains are no longer beholden to the vulnerable health security dilemmas which Xinjiang-manufactured imports leaves for national security concerns, whilst additionally supporting measures to hold the PRC to account over the atrocities occurring in Xinjiang.

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<sup>68</sup> UK Parliament, 2021.

<sup>69</sup> Gartside and Hazelwood, 2021.

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